BANKRUPTCY ANALYSIS OF BANKING COMPANIES IN INDONESIA PERIOD 2001-2012
(Using the Altman *Z-Score* Model)

A) Andi Sanjaya[1]* B) Lindrianasari[2] C) Aminah[3]

[1,2,3] Faculty of Economics, University of Bandar Lampung, Lampung, Indonesia

*Corresponding email: sanjaya350@gmail.com

Abstract

The purpose of this study is to provide empirical evidence about the bankruptcy prediction model used by Altman. Research questions were constructed in this study is whether the Altman Z-Score model that built in 1968 can be used and relied upon in accommodating economic climate in Indonesia, especially as a predictor of bankruptcy in Indonesia banking company. Statistical test results showed that the Altman Z-Score model appropriate for use in predicting the potential bankruptcy of the Indonesia banking company on the observation period 2001-2012. By doing so, this study conclude that the Altman Z-Score models can be a tool for predicting bankruptcy in Indonesia.

Keywords: Altman Z-Score, Bankruption, Indonesia Banking Corporation.

1. INTRODUCTION

Banking industry during the last period has experienced a rapid development. Bank is considered as the driving wheels of the economy of a country. This is because the function of banks as financial institutions is very important, for example in circulation of money to support business activities, a place to save money, to make a payment or billing, finance, and many other financial services. To maintain a financial system, a bank must be able to compete with competitor banks and other financial service providers which also provide financial services. A bank is said to have won the business competition if it is able to provide better financial services than its competitors and is able to adapt to any changes in the environment. To anticipate the emergence of financial difficulties at the bank, there is a need to have a system that can provide early warning to the financial problems that threaten the survival of the bank's operations. With the early detection of banking conditions, it is possible for the banks to do the anticipatory measures to prevent the financial crisis; it can be promptly handled.

The climate and economic conditions in Indonesia has its own peculiarities, so the use of bankruptcy prediction model needs to be tested first whether it reliably accommodates the economic climate in Indonesia or not.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Discriminant analysis is useful for companies to gain early warning of bankruptcy and the business continuity. The earlier a company acquires bankruptcy warning, the better the management is because the management can make repairs and can provide an overview and solid expectations of the future value of the company. Bankruptcy is usually interpreted as a failure of the company to run the company's operations in generating profits. Martin et.al, (1995:376) in Umaris (2005:23) said that bankruptcy can be defined as a failure in some sense namely:

1) Economic Failure (*ecomonic distress*). Economic failure means that the company is losing money or the income of the company does not cover the cost itself. Failure occurs when the actual cash flow of the company fell below the expected cash flows. Failure can also mean that the level of investment income on the historical cost is less than the cost of capital.

2) Financial Failure (*financial distress*). The financial failure could be interpreted as the insolvency that distinguishes between cash flow basis which has two forms; insolvency in the technical sense (technical insolvency) and insolvency in the bankruptcy sense.

In a technical sense, the company can be considered a failure if it can not meet its obligation in maturity although total assets exceed total debt, or a company fails to comply with one or more conditions in the provision of debt as the ratio of current assets to current liabilities ratio set or wealth net assets to the required total assets. Whereas in terms of bankruptcy, a failure is measured from negative net worth in the conventional balance sheet or present value of cash flow which is expected smaller than the liabilities. Bankruptcy is also often called as liquidation or closure of the company or companies insolvability.

Meanwhile, according to Bank Info (1997) in Sutrisno (2004:19) liquidation has three meanings namely the realization of cash, termination of business by way of conversion of assets into cash, and distributing the results of the conversion. The latter sense is a way of healing available to borrowers which could not pay its obligations (*insolvent*).

Based on the above, it can be concluded that the bankruptcy is a situation in which companies can no longer afford or fail to meet its obligations to creditors because the company does not already have or lack the funds to keep the company's operations running, so the goal of the company's economic to gain profit is not achieved.

Altman Z-Score Model

Z-Score is a score that is determined from the standard count times financial ratio indicating the chances of a magnitude level of corporate bankruptcy. *Z-Score* formula for predicting the bankruptcy of Altman is a *multivariate formula* that is used to measure the financial health of a company. Altman found five types of financial ratios that can be combined to see the difference between a company that went bankrupt and not bankrupt.

Discriminant function Z found by Altman to banking companies that have gone public is determined by using the following formula (S.Munawir, 2002: 309):

$Z\text{-}Score = 1{,}2 X_1 + 1{,}4 X_2 + 3{,}3 X_3 + 0{,}6 X_4 + 1{,}0 X_5$

Whereby:

X_1 = *Working Capital / Total Assets*

X_2 = *Retained Earning / Total Assets*

X_3 = *Earning before Interest and Taxes (EBIT) (earnings before deducting interest expense) / Total Assets*

X_4 = *Market Value of Equity (market price of stocks) / Total Liabilities*

X_5 = *Sales / Total Assets*

With the following assessment criteria:

a) *Z-Score* > 2,99 is classified as a very healthy company, so it does not run into financial difficulties.

b) 1,81 < *Z-Score* < 2,99 is in the gray area so that it is classified as a company having financial difficulties, but the bankrupt chances and bankrupt opportunities are the same. It depends on the discretion of the management company's decision as a decision maker.

c) *Z-Score* < 1,81 is classified as a company that has enormous financial difficulties and are at high risk, so that it has the greater chances of bankruptcy.

These five ratios will be used to analyze a company's financial reports to then detect the chances of bankruptcy of the company.

In financial management, the ratios used in Altman's method can be categorized into three major groups namely:

- Liquidity Ratio consisting of X1
- Profitability Ratio consisting of X2 and X3

- Activity ratio consisting of X4 and X5

The description of each of these variables are as follows:

a. *Working capital to total assets* is used to measure the liquidity of company assets relative to its total capital or to measure the company's ability to meet short-term obligations. Indicators that can be used to detect problems at the level of corporate liquidity are internal indicators such as insufficient cash, trade debt that swells, and several other indicators.

b. *Retained earnings to total assets* is used to measure the cumulative profitability. This ratio measures the company's accumulated profits during operation. The firm age affects this ratio because the longer it operates, the more possibility it facilitates the accumulation of retained earnings. Doing so may cause the company that is generally still relatively young show the results of a low ratio except that with very large profits at the beginning of its establishment.

c. *The earnings before interest and tax to total assets* is used to measure the actual productivity of the company assets. The ratio measures the company's ability to generate earnings from used assets. This ratio is the largest contributor of the model. Some of the indicators that can be used in detecting a problem with the ability of the company's profitability include the increase of receivable accounts, a continuous loss in some quarters, the increase in inventory, the sales are down, and the delay in the result of debt collection.

d. *The market value equity to book value of total debt* is used to measure how many assets of a company can go down in value before the amount of debt is greater than its assets, and the company becomes insolvent. The capital in question is the combined market value of the common stock and preferred stock while the debt includes current liabilities and a long term debt.

e. *The sales to total assets* is used to measure the ability of management in facing the competitive conditions. The ratio measures the ability of management to make use of assets to generate sales.

The research that has been done before is by Endri (2008) who analyzed the accuracy of Altman Z -Score model in predicting bankruptcy in Islamic Banks for three years from 2005-2007. Variables used by model of Altman Z -Score for companies that have not gone public are the ratio of working capital / total assets (X_1), retained earnings / total assets (X_2), EBIT (Earning Before Interest & Tax) / total assets (X_3), the book value stock / book value of debt (X_4), and sales / total assets (X_5). With the formula of $Z = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5$ the result shows that the Altman Z -Score model is less appropriate to be used for predicting bankruptcy in Islamic banking.

Kamal (2012) analyzed the bankruptcy prediction in *go public* banks in Indonesian Stock Exchange in 2008-2010 by using the Altman Z -Score model. Variables used are model of Altman Z –Score, the ratio of working capital / total assets (X_1), retained earnings / total assets (X_2), EBIT (Earning Before Interest & Tax) / total assets (X_3), the stock market value / book value of debt (X_4), and sales / total assets (X_5). With the formula of $Z = 1.2 X_1 + 1.4 X_2 + 3.3 X_3 + 0.6 X_4 + 1.0 X_5$ Kamal research found that the Altman Z -Score model can predict bankruptcy of banks listed on the Indonesian Stock Exchange.

The mixed results encourage research on this issue, and the hypothesis constructed is:

H₁: *Altman Z -score* model can be used as a predictor of bankruptcy on corporate banking in Indonesia.

3. RESEARCH METHOD

Samples and Data Research

The sample of this research is banking companies listed in Indonesia Stock Exchange which ceased operations between the periods 2001 to 2012. The data used is a financial report data available on the *Indonesian Capital Market Directory* (ICMD) of at least three consecutive years before the bank stops operating. Additional data obtained from various sources; books, journals, magazines, and other related resources.

Research Model

The data processing in this study will be conducted with the help of Excel and SPSS program. The analysis used to describe the state of each company group, loss or no loss, is done through the calculation using Altman formula. The model analysis is as follows:

$$Z = 1{,}2X1 + 1{,}4X2 + 3{,}3X3 + 0{,}6X4 + 1{,}0X5$$

$$Z = 1.2 \ X1 \ X2 + 1.4 + 3.3 + 1.0 \ X3 + 0.6 \ X4 \ X5$$

4. ANALYSIS RESULTS AND DISCUSSION

4.1 Descriptive Statistics

The sample used in this study consists of 4 banking companies which ceased operations period 2001-2012. An overview of the financial ratios of each bank can be seen in Table 1.

Tabel 1 : Uji Statistik Deskriptif

	N	Minimum	Maximum	Mean	Std. Deviation
Z3	4	-.099	.415	.23600	.228680
Z2	4	-.031	.413	.22650	.190628
Z1	4	.014	.387	.20475	.194969
Valid N (listwise)	4				

From the table above it can be seen that the value of the average Z -Score in the third year before the bank stopped operating was at 0.236. The smallest Z -Score value in the third before stopping operation was achieved by Lippo Bank amounting to -0.099. Z -Score greatest value in the third year before stopping operation was achieved by Danpac Bank of 0.415.

The average value of Z -score in the second year before the bank stopped operating was at 0.22650. Z -Score smallest value in the second year before it stopped operating again was achieved by Lippo Bank of -0.031. Z -Score greatest value in the second year before it stopped operating again was achieved by Danpac Bank amounted to 0.413.

The average value of Z -Score banking in the first year before it stops operating is at 0.20475. The smallest Z -Score value in the first year before it ceased operations was achieved by Pikko Bank of 0.014. Z -Score greatest value in the first year before it stopped operating again was achieved by the Danpac Bank amounted to 0.387.

This suggests that the Lippo Bank during the second and the third year before stopping operation has the lowest value of Z -Score while in the first year before it ceased operations, the lowest value of the Z -Score is obtained by Pikko Bank. In addition, for three consecutive years before it ceased operations, Danpac Bank has the highest Z -Score value.

4.2 Normality Test

Normality test aims to test whether or not the research model variables are normally distributed. Good regression model is regression model that has normal or near normal distribution of residual value. Normality test data in this study uses *One-Sample Kolmogorov Smirnov test*. The criteria used to compare the *probability value* obtained with the guidelines of decision making are as follows:

a. If the probability value> 0.05 then the data are normally distributed.

b. If the probability value <0.05 then the data are not normally distributed.

From the test results with the Kolmogorov test it can be seen that the results of the Z-Score banking for three consecutive years before it ceased to operate has a normal distribution because the significant value is greater than the significance level of 0.05.

4.3 Hypothesis Testing

The hypothesis testing using the *Wilcoxon Signed Ranks Test* is the Altman Z-Score method that is used precisely to predict the potential bankruptcy of the banking company in Indonesia. The analysis results can be seen in table 2 below.

Table 2 the Testing of *Wilcoxon Signed Ranks Test*

Keterangan	Signifikansi nilai Z	Conclusions
Z-SCORE (t-3) – (t-2)	1,000	Dapat digunakan
Z-SCORE (t-2) – (t-1)	1,000	Dapat digunakan

The test is conducted with a significance level ( ) of 0.05 or 95% level of confidence. Based on the analysis of table 2 it can be seen that the variable has a significance of Z-Score value is greater than the significance level ( ) of 0.05, ie Z> 0.05, so **the research hypothesis is accepted**. This means that the Altman Z-Score can be used in assessing and predicting the potential bankruptcy of the banking company in Indonesia.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Based on the research results on the analysis of the bankruptcy in corporate banking in Indonesia during 2001-2012 using the Altman Z -Score models, it can be concluded from the hypothesis testing that the Altman Z -Score models is appropriate for use in predicting the potential bankruptcy of the *go public* banking companies in Indonesia. This indicates that the model developed by Altman about Z -Score can accommodate climate and economic conditions in Indonesia as an early warning system of potential bankruptcy, so that corrective measures can be done to prevent it.

5.2 Recommendations

In order to obtain the satisfactory Z -Score results and to avoid the potential bankruptcy, the banking company should:

1) raise the working capital, the company can reduce short-term liabilities by using long-term funding sources. This will increase the amount of working capital, so that it is no longer in small amounts. As a result, the ratio of working capital to total assets will rise.
2) increase the productivity of the funds managed by reducing or selling unproductive assets to be added to the productive assets or used to pay off liabilities. This would result in the ratio of working capital to total assets, the earnings ratio is retained to total assets, the ratio of earnings before interest and taxes to total assets, and the ratio of market value of equity to total debt will rise due to the reduced value of total assets, reduced interest costs, and increased income.
3) review the dividend policy, so that it can cause a rise in the earnings ratio retained to total assets.
4) At the time banks require additional funding, it should be considered for the first source of funding that does not hurt the company. Additional funds from owners might be better because the delivery cost is less than the costs that come from third parties, so that the company's liquidity and solvency can be maintained.

REFERENCES

[1] *bi.go.id/NR/rdonlyres/734CC2E4-028F.../Kepailitanbank*.pdf. Diakses tanggal: 1 Agustus 2013
[2] *DAFTAR BANK DI INDONESIA. Terpublikasikan melalui link: id.wikipedia.org/wiki/ Daftar_ bank_di_Indonesia*. diakses tanggal: 1 Agustus 2013 Diakses tanggal: 1 Agustus 2013
[3] DIANA ATIM IFLAHA. 2008. *Analisis Financial Distress dengan Metode Z-Score Untuk Memprediksi Kebangkrutan Perusahaan. (Studi pada Perusahaan Restoran, Hotel dan Pariwisata yang Listing di Bursa Efek Indonesia Periode 2003-2007)*. Skripsi Fakultas Ekonomi Jurusan Manajemen. Universitas Islam Negri Maulana Malik Ibrahim. Perpustakaan Pusat.   Terpublikasikan melalui link: lib.uin-malang.ac.id/

files/thesis/fullchapter/04610029.ps. Diakses tanggal: 1 Agustus 2013

[4] FANNY, SAMARONI, *UMARIS*. 2005. Analisis Kebangkrutan Model Altman Z-Score dan Springate. Skripsi Fakultas Ekonomi Jurusan Akuntansi. Universitas Budi Luhur.

[5] Harahap, Sofyan Safri. 2008. *Analisis Kritis Atas Laporan Keuangan*. Jakarta: PT Raja Grafindo Persada.

[6] Ikatan Akuntan Indonesia. 2007. *Standar Akuntansi Keuangan*. Jakarta: Salemba Empat.

[7] INDONESIA STOCK EXCHANGE. www.idx.co.id

[8] IRSYAD NURDIN. 2012. *Peranan Analisis Metode Z-Score dalam Memprediksi Kebangkrutan Suatu Perusahaan dan Kaitannya Terhadap Harga Saham (Studi Pada Perusahaan Perbankan Yang Go Public Di Bursa Efek Indonesia)*. Jurnal Skripsi Fakultas Ekonomi Jurusan Akuntansi. Universitas Siliwangi. Terpublikasikan melalui link: *journal.unsil.ac.id/download.php?id=362*. Diakses tanggal: 1 Agustus 2013

[9] Kasmir. 2008. *Bank dan Lembaga Keuangan Lainnya*. Edisi Revisi. Jakarta: PT Raja Grafindo Persada.

[10] *MULIAMAN D HADAD, WIMBOH SANTOSO, SARWEDI, HARI SUKARNO, MOHD ADENAN. 2004. Model prediksi kepailitan bank umum di Indonesia. Jurnal Riset Biro Stabilitas Sistem Keuangan. Bank Indonesia. Terpublikasikan melalui link:*

[11] S. Munawir. 2002. *Analisis Informasi Keuangan*. Yogyakarta: Liberty Yogyakarta

[12] Sanusi, Anwar. 2011. *Metodologi Penelitian Bisnis*. Jakarta: Salemba Empat.

[13] ST.IBRAH MUSTAFA KAMAL. 2012. *Analisis Prediksi Kebangkrutan pada Perusahaan Perbankan Go Public di Bursa Efek Indonesia (dengan Menggunakan Model Altman Z-Score)*. Skripsi Fakultas Ekonomi dan Bisnis Jurusan Manajemen. Universitas Hasanuddin Makassar. Terpublikasikan melalui link: *REPOSITORY.UNHAS.AC. ID/HANDLE/123456789/1051. Diakses tanggal: 1 Agustus 2013*

[14] SYAMSUL HADI dan ATIKA ANGGRAENI. 2008. *Pemilihan Prediktor Delisting Terbaik (Perbandingan Antara The Zmijewski Model, The Altman Model, dan The Springate Model)*. Skripsi Fakultas Ekonomi Jurusan Akuntansi. Universitas Islam Indonesia. Terpublikasikan melalui link: *journal.uii.ac.id/index.php/JAAI/article/ view/2263/2065*. Diakses tanggal: 1 Agustus 2013

[15] Terpublikasikan melalui link: *bi.go.id/NR/rdonlyres/C7402D01-A030-454A.../uu_bi_1099.pdf*

[16] Terpublikasikan melalui link: riset.budiluhur.ac.id/wp-content/uploads/2012/06/ AKUKEU_VOL-1_NO-1_6.pdf. Diakses tanggal: 1 Agustus 2013

[17] UNDANG-UNDANG No.10 Tahun 1998 tentang Perbankan, Bank Indonesia.Jakarta.

[18] YULIA PURWANTI. 2005. *Analisis Rasio Keuangan Dalam Memprediksi Kondisi Keuangan Financial Distress Perusahaan Manufaktur yang Terdaftar di Bursa Efek Jakarta*. Skripsi Fakultas Ekonomi. Universitas Islam Indonesia Yogyakarta. Terpublikasikan melalui link:research.mercubuana.ac.id/proceeding/ 20080612031421101312384.pdf. Diakses tanggal: 1 Agustus 2013