BANKRUPTCY ANALYSIS USING ALTMAN Z SCORE MODEL IN MANUFACTURING COMPANY AT INDONESIA STOCK EXCHANGE IN 2013-2014

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STIE Indonesia Rawamangun

Abstract: Analysis of financial distress is very important, because it enables to assess an indication of the company's financial distress, how the indication of financial distress using Altman z-score in industry manufacturing sector in 2013-2014, and whether the Altman z-score model can be used as a tool in predicting the tendency of financial distress. The purpose of this study is to analyze the financial distress of 125 manufacturing companies with different sectors and subsectors using Altman Z-Score model in 2013 and 2014. The source of data used was secondary data, such as financial statements of manufacturing companies' publication issued by BEI and obtained from the internet by downloading through the website: www.idx.com. This study employed descriptive quantitative method. The findings of the Z-Score index on manufacturing companies in 2013 were occupied by PT. Intan Wijaya International Tbk. in chemical subsector, and in 2014 Herbal and Pharmaceutical Industry of PT Sido Muncul Tbk. was the first highest rank and healthy condition. Whereas the lowest rank was PT. Asia Pacific Fiber Tbk. in textile and garment sub-sector in 2013 and 2014, having financial distress condition. The findings of this study are not consistent or even in accordance with the reality which shows that the Altman method cannot be used as a tool to indicate a tendency towards company's financial distress.

INTRODUCTION

Company's bankruptcy is a phenomenon that commonly occurs in the business's world that is influenced by internal or external factor. For example, there is an increase in raw material cost, wage cost, or other costs without being offset by company's ability, or competitor's product's existence that is superior which consequently affects the sales and manager's incapability to manage a company. This particular problem will directly affect company's performance reduction which leads into bankruptcy.

To anticipate the possibility of bankruptcy a company must have early preparation to prevent unexpected things happen. A company is expected to have an access on company's ongoing situation to obtain a better picture from company's current situation, thus it will lead to a right decision to keep a company stay alive and stay compete in business.

One of bankruptcy models proven to give many benefits is the Z-Score model. This model is developed by Edward I Altman, a financial economist. This model is a discriminant multiple statistical techniques that combine several variables effect. It is a financial analysis which has been widely used in the USA. In the study, Altman took a sample of 66 companies which half of it has gone bankrupt. Based on Multiple Discriminant Analysis model, fifth financial ratio's coefficient is determined later. The addition and multiplication between the coefficient and financial ratio create multivariate score. Altman, mentioned this multivariate score as Z-Score.

Research on Altman Z-Score method in Indonesia, is conducted by Usman (2013). The result shows that in 2013 as many as 54.5 % company are healthy, 9.1 % is gray area and 36.4 % is in bankrupt. PT Malindo Feedmill Tbk, PT Gudang Garam Tbk, PT Hanjaya Mandala Sampoerna Tbk, PT Multi Bintang Indonesia Tbk, and PT Delta Djakarta Tbk are predicted as healthy company. Further research by Silaban (2014) on bankruptcy analysis uses Altman Z-Score Model, a case study in Perusahaan Telekomunikasi. The analysis shows that between 2010-2012 company's health is not in a good position. If a company is in gray area in 2010, it means that it decreases in the next year, therefore, the company will be bankrupt in 2012. Telkom is in healthy zone and increasing every year, meanwhile, Indosat is in unhealthy zone by z-score that always increases every year. Next study by Jaya (2014) on financial report as bankruptcy prediction uses Altman model. The result of the above study indicates that Altman model can be used as a tool to predict company's bankruptcy.

Some studies use sampling from manufacture industry because the growth rate only reaches 6,2% in 2013. Various problems occur from laborer to energy that inhibits manufacturer's growth. One of the problems is provincial minimum wage increases in some areas that reach 40% to make industrial expense increases, especially for a labor-intensive industry that use a lot of manpower to operate. Other problem such as electricity tariff increases along with the rise in gas price increases. With this uncertain situation and condition experienced by manufacturing industry, it becomes heavy to grow thus the industry must adapt to the pressure. Meanwhile, sluggish infrastructure developments do not only make the industry's growth trimmed but also make the high cost of economy and logistic.(http://www.kemenperin.go.id/)

The bankruptcy analysis is very important because it indicates the company's bankruptcy, whether it is threatened by bankruptcy or not. When a company's file for bankruptcy, there are lots of harmed parties such as manager, investor, creditor, and even the employees. Based on the problems above, the researcher considers conducting a study on how is bankruptcy's indication uses Altman Z-Score model in manufacture industry in 2013 and 2014; whether Altman Z-Score Model can be used as a tool to predict company's bankruptcy trend. This study is conducted by analyzing bankruptcy using Altman Z-Score Model in manufacture industry listed at Indonesia Stock Exchange in 2013-2014.

The study's research problem is: Is the Altman Z-Score model can be used as a tool to predict company's bankruptcy trend? While the objective of the study is whether Altman Z-Score Model can be used as a tool in predicting company's bankruptcy trend.
RESEARCH METHOD

Research Population
The population used in this study was the company engaged in sector that listed at Indonesia Stock Exchange (BEI) in the 2013-2014 period as many as 139 companies.

Research Sampling
Sampling technique used in the study was purposive sampling, that was a carefully selected sample relevant to research design and was expected to represent each of the population characteristics, by the following criteria:
1. The company was included in Indonesia’s manufacturing industry.
3. The Manufacturing Company was not in a state of merger or liquidation.
Sampling used in this study was 125 manufacturing companies listed at Indonesia Stock Exchange (BEI), 14 of them were not used as the sample because of incomplete financial report, such as: WTON, ISSP, ETWA, SOBI, AKPI, SIPD, MYTX, IKBI, VOKS, AIISA, ALTO, UNVR, CINT, KDSI.

Research Variable
This study used 2 variables, namely dependent variable and independent variable. A dependent variable was company’s bankruptcy status while an independent variable was Liquidity (X1), Profitability in certain period (X2), Profitability (X3), Financial Structure (X4), and a Capital Turnover (X5):

Research Model
Z-Score calculation was started by calculating used variables then entered those variable score into Z-Score to obtain Z score. The variable consisted of Liquidity Ratio (X1), Age of Firm and Cumulative Profitability Ratio (X2), Profitability Ratio (X3), Financial Structure Ratio (X4), and Capital Turnover Ratio (X5)

Z-Score can be calculated using:
Z-Score = 0,717X1 + 0,847X2 + 3,107X3 + 0,420X4 + 0,998X5
In which:
X1 = (Current Asset - Current Liabilities) / Total Asset
X2 = Retained Earning / Total Asset
X3 = EBIT / Total Asset
X4 = Market Value Equity / book value of Total Debt
X5 = Sales / Total Asset

Z-Score Indication
< 1.81 Bankrupt
1.81 - 2.99
> 2.99 Gray Area / zone of ignorance
Not Bankrupt

Data Collection
This study used quantitative data. The data was secondary data, in the form of Publication Financial Statement Manufacturing Company data published at Indonesia Stock Exchange and website: www.idx.com.
The literature review was collected from any sources such as theses, journals, articles, newspapers, books, etc. The researcher collected, studied and noted the necessary data that gathered from various sources in STEI's library or other library.
The technique used in collecting the data was literature research (Library research). As well as observation in directly observing research object to get the real situation of the object obtained. Through this field research (field research) the researcher wanted to know the consistency test, thus the researcher would obtain a relevant and accurate data.
Data Analysis Method

The method of analysis used by researcher to process the data was using Altman Z-Score method and level of conformity test with the actual reality.

The stage that was used in this study to determine financial condition using Altman Z-Score were:

1. Calculating financial ratio
2. Conducting a calculation with discriminant analysis found by Altman through following formula:
   \[ Z\text{-Score} = 0.717X1 + 0.847X2 + 3.107X3 + 0.420X4 + 0.998X5 \]
3. Conducting an interpretation of processed Z-Score result calculation. This was certainly with the limit that has been determined,
   \[
   \begin{align*}
   & \text{Z-Score} \quad \text{Indication} \\
   & < 1.81 \quad \text{Bankrupt} \\
   & 1.81 \text{–} 2.99 \quad \text{Gray Area / zone of ignorance} \\
   & > 2.99 \quad \text{Not Bankrupt}
   \end{align*}
   \]
4. Arranged a ranking index/ranking based on z-score.

In this study, the researcher used historical analysis to determine conformity level with actual reality.

Data Collection

This study used quantitative data. The data was secondary data, in the form of Publication Financial Statement Manufacturing Company data published at Indonesia Stock Exchange and website: www.idx.com.

The literature review was collected from any sources such as theses, journals, articles, newspapers, books, etc. The researcher collected, studied and noted the necessary data that gathered from various sources in STEI's library or other library.

The technique used in collecting the data was literature research (Library research). As well as observation in directly observing research object to get the real situation of the object obtained. Through this field research (field research) the researcher wanted to know the consistency test, thus the researcher would obtain a relevant and accurate data.
FINDINGS AND DISCUSSION

Altman Z-Score Model Analysis
Altman score calculation is presented in Table 1 below.

Table 1. Company Rating Index Result in 2013

<table>
<thead>
<tr>
<th>Code</th>
<th>Z-Score</th>
<th>Ranking</th>
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</thead>
<tbody>
<tr>
<td>INCI</td>
<td>5.2488</td>
<td>1</td>
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<tr>
<td>MLBI</td>
<td>5.2049</td>
<td>2</td>
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<tr>
<td>HMSP</td>
<td>5.0123</td>
<td>3</td>
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<tr>
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<td>KIAS</td>
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<tr>
<td>DPNS</td>
<td>3.5497</td>
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</table>

Source: Data analysis result

In Table 1, a company with INCI code is PT. Intan Wijaya Internasional Tbk in chemical subsector that has 5.2488 z-score. The company has an indication higher than 2.99 so that it is on healthy condition and the first rank of manufacturing company in 2013. Next, the company with SQBB code is PT. Taisho Pharmaceutical Indonesia Tbk in pharmacy subsector that has 3.0478 z-score by an indication is higher than 2.99. Consequently, the company is in health condition and ranked 19th in manufacturing company in 2013.

Table 2. Company Rating Index Result in 2014

<table>
<thead>
<tr>
<th>Code</th>
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<th>Ranking</th>
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</thead>
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<td>SIDO</td>
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<td>HMSP</td>
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<td>SMBR</td>
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<td>TBMS</td>
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<td>KICI</td>
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<tr>
<td>KLBF</td>
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</tbody>
</table>

Source: Data analysis result

Bankruptcy Analysis Using Altman Z Score Mode In ...
In Table 2, a company with SIDO code is PT. Industri Jamu & Farmasi Sido Muncul Tbk in pharmacy subsector that has 5,3240 $z$-score by an indication is upper than 2,99. The result means that a company is in healthy position and ranked/highest rank in manufacturing company at Indonesia Stock Exchange (BEI) in 2014. Next, the company with KLBF code is PT. Kalbe Farma Tbk in pharmaceutical subsector that has 3,0989 $z$-score by an indication is upper than 2,99 which is ranked 22nd in manufacturing company at Indonesia Stock Exchange (BEI) in 2014.

Table 3.

<table>
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<tr>
<th>Code</th>
<th>Z-Score</th>
<th>Ranking</th>
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Source: Data analysis result
In Table 3, it is GDST code, that is PT. Gunawan Dianjaya Steel Tbk in metal subsector that has 2,9706 z-score by an indication of 1,81 - 2,99. The result means that a company is in gray area and ranked the highest in manufacturing company at Indonesia Stock Exchange (BEI) in 2013. Further, PT Sri Rejeki Isman Tbk with SRIL code in textile & garment subsector that has 1, 8466 z-score by an indication is 1,81 - 2,99. The results indicates that a company is ranked on 45th in manufacturing company in 2013.

Table 4.
2014 Gray Area indication ranking index

<table>
<thead>
<tr>
<th>Code</th>
<th>Z-Score</th>
<th>Ranking</th>
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</thead>
<tbody>
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</table>

Source: Data analysis result
Table 4 shows that a company with APLI code is PT. Asiaplast Industries Tbk in plastic subsector & packaging that has 2,8984 z-score by an indication of 1.81 - 2.99. Consequently, the company is in gray area and ranked the first in manufacturing company at Indonesia Stock Exchange (BEI) in 2014. Further, the company with CTBN code is PT. Citra Tubindo Tbk in metal subsector that has 1,8696 z-score by an indication of 1.81 - 2.99. The company is in gray area, ranked 41st in manufacturing company at Indonesia Stock Exchange (BEI) in 2014.

Table 5.
2013 Bankrupt Indication Ranking Index Result

<table>
<thead>
<tr>
<th>Code</th>
<th>Z-Score</th>
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Source: Data analysis result

Table 5 shows that a company with PYFA is PT. Pyridam Farma Tbk in pharmacy sub sector that has 1,8020 z-score by an indication of < 1.81. The result means that a company is in bankrupt position and ranked/ highest ranked in manufacturing company at Indonesia Stock Exchange (BEI) in 2013. Further, the company with POLY code is PT. Asia Pacific Fibers Tbk in textile & garment sub sector that has (5,2665) z-score by an indication of < 1.81. The company is ranked in 61st in manufacturing company in 2013.
Table 6.
2014 Bankrupt Indication Ranking Index Result

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<th>Ranking</th>
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<td>POLY</td>
<td>(8.0419)</td>
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</tbody>
</table>

Source: Data analysis result

In Table 6 a company with TPIA code is PT. Chandra Asri Petrochemical Tbk in pharmacy sub sector that has 1,7036 z-score by an indication of < 1.81. Consequently, the company is in bankrupt and ranked/first ranking in manufacturing company in 2014. Further, the company with POLI code is PT. Asia Pacific Fiber Tbk in textile & garment that has (8,0419) z-score by an indication < 1,81. Consequently, the company is in bankrupt and ranked/ranking 62nd or the lowest in manufacturing company in 2014.

Table 7.
Company Health Level Percentage

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<th>Indication</th>
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<th>2014</th>
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<td>Healthy</td>
<td>15.2%</td>
<td>17.6%</td>
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<tr>
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<td>36%</td>
<td>32.8%</td>
</tr>
<tr>
<td>Bankrupt</td>
<td>48.8%</td>
<td>49.6%</td>
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</tbody>
</table>

Source: Data analysis result

Bankruptcy Analysis Using Altman Z Score Mode In...
Based on the researcher study on bankruptcy indication uses Altman Z-Score method in Table 4.7 indicates that in 2014 at Indonesia Stock Exchange (BEI) there are 125 manufacturing companies from various sector with the percentage of 49,6% is in bankrupt, 32,8% is in gray area, and 17,6% in healthy position. The healthy position is fewer than other, this means to be not good in manufacturing company at Indonesia Stock Exchange (BEI) in 2013 at Indonesia Stock Exchange there are 125 manufacturing companies from various sector with the percentage of percentage of 48,8% is in bankrupt and 36% is in gray area and 15,2% is in healthy position. The healthy position is fewer than the other; this means to be not good in manufacturing company at Indonesia Stock Exchange (BEI).

Conformity with Actual Reality Analysis

Table 8
Conformity with Actual Reality Tahun 2013 – First I

<table>
<thead>
<tr>
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<th>2014 bankrupt / no bankrupt</th>
<th>2013 Z-Score</th>
<th>2014 bankrupt / no bankrupt</th>
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Conformity with Actual Reality 2013 – Part II

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Source: Data analysis result

### Table 10
Conformity with Actual Reality Tahun 2014 – Part I

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Bankruptcy Analysis Using Altman Z Score Mode In...
Table 11
Conformity with Actual Reality 2014 – Part II

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Source: Data analysis result
In Table 8 to Table 11, it is showed that company's operation is still running normally in the further year and a company is said running in good condition after observed by the researcher. The results show that there is no conformity between index result and actual reality. Therefore, Altman z-score model index result cannot be used to predict company's bankruptcy, particularly in manufacturing industry listed in Indonesia stock exchange (IDX).

CONCLUSION

Conclusion
1. Manufacturing company's Z-Score index result in 2013 was occupied by PT. Intan Wijaya Internasional Tbk in pharmacy sub sector that ranked in the first place with a healthy condition, meanwhile the latest and the lowest rank was occupied by PT. Asia Pacific Fiber Tbk in textile & garment with bankrupt.
2. Manufacturing company's Z-Score index result in 2014 was occupied by PT. Industri Jamu & Farmasi Sido Muncul Tbk in pharmacy sub sector as the first rank with healthy condition, while the latest is PT. Asia Pacific Fiber Tbk in textile & garment with bankrupt condition.
3. This result of the study is not consistent/suitable with the actual reality showing that Altman method cannot be used as company's bankruptcy trend tool.

Limitation
In this study there is limitation that can be taken into consideration for the next researcher in order to get better result. The limitations are:

a. Altman z-score analysis result is closely related to the limited number of sample and used data and period. So, this research is not able to analyze a whole part because Altman z-score analysis is limited to manufacturing company only so that it only describes manufacturing company's condition only.
b. Observation period that is only one year, it may give different result if it is conducted in longer period.
c. The used model in this study is only Altman Z-Score, basically there are several models to analyze bankruptcy, it may be different if it is used other model or several models.

Suggestion
The suggestions after conducting the study are:
1. Suggestion to manufacturing company
   It is better that manufacturing company should always maintain and improve the company's performance even better, since based in 2013 and 2014 result, most of the company sampled have the potential to experience bankruptcy's indication with Z-Score value lower than 1.81.
   For manufacturing company, an Altman z-score model cannot be used to indicate a bankruptcy due to inconsistency with reality, but this model can help to assess and provide input for company's improvement and retention.

2. Suggestion to further study:
   The researcher realizes that this research is not perfect at all. The researcher provides suggestions for further research. The number of sample and research's period are extended to produce better information. It is expected to be able to analyze other uncontrolled variable in this study or use various models for bankruptcy analysis such as Springate, Fulmer, Blasztk, etc.
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Peraturan Pemerintah Nomor 60 Tahun 2008 tentang Sistem Pengendalian Intern Pemerintah.
Peraturan Pemerintah Nomor 58 Tahun 2005 tentang Pengelolaan Keuangan Daerah.
Peraturan Pemerintah Nomor 60 Tahun 2008 tentang Sistem Pengendalian Intern Pemerintah.


_Bankruptcy Analysis Using Altman Z Score Mode In ...._