Financial Distress Prediction of Mining Companies Listed In Indonesian Stock Exchange: An Analysis Using Altman Z-Score Model

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Abstract

Financial distress condition can have a severe consequences such as a degradation in companies' performances and the worst scenario is bankruptcy to the companies who are experiencing it. Therefore it is imperative for the companies to investigate the causes that may lead to a corporate bankruptcy and take a necessary action in order to prevent such situation. Thus, this study investigate the financial distress signal among 18 mining companies listed in Indonesian stock exchange which are divided into three subsectors of metallic mineral, coal, and oil & gas mining over the period of four years (2011-2014). This research assess the financial distress determinant measured by Altman Z-score model. Furthermore, this study also examine which of the three subsectors have a better Z-score ratio using Kruskal-Wallis statistical model. The result of the study shows that metallic mineral mining have the highest Z-score ratio compared to the coal sector and oil & gas sector, while the lowest Z-score are experienced by oil & gas sector and coal mining sector being the second highest. The result also shows that there were mining companies who experienced financial distress through the four years period, in which all of the three subsectors had experienced an increase number of financial distress companies year by year.

Keywords: *Financial Distress, Bankruptcy, Altman Z-Score Model, Mining Companies, Metallic Mineral, Coal, Oil & Gas.*

Introduction

Indonesia is well known as a rich natural resources country and resulted in flourishing mining sectors such as natural oil and gas, hard minerals (metallic, non-metallic/industrial mineral, coal, and stone). Mining sector in Indonesia is divided to three types of sub-sector, those are oil and gas mining sub-sector, and non-oil gas mining sectors which consists of general mining sub-sector (metallic and non-metallic Industry which includes gold, silver, nickel and so forth, and coal mining). This sector is considered as one of the imperative pillars in economic development because of its role in providing of energy sources that is indispensable for the country (Soelistijo *et al*., 2015).

Mineral and energy (oil, gas and coal) commodities have always contributed to Gross Domestic Product (GDP) of Indonesia because of its potential resources. This sector is a prime source of GDP which gains profit to national income through trade of its commodity (Soelistijo *et al*., 2015). The mining sector is also a major earning source for Indonesia through export. It will remain a big contributor to the country's foreign exchange income in the coming years (Herliansyah, 2012). According to the world Bank Notes, Indonesia is one

of the world's largest exporter of refined tin and thermal coal, the host to the world's largest gold mining company, as well as one of the five largest copper mines. Indonesia also holds proven oil reserves of 3.6 billion barrels and ranks 20th among world oil producers, accounting for approximately 1.1% of world oil production (Soelistijo *et al.*, 2015).

In the last four years, however, there seems to be a concern in the progress of mining commodities in Indonesia in general. In the year of 2011, Europe experienced global financial crisis originated from the Greek which caused economic downturn due to strict policy they impose to their budgets. The global financial crisis that hit Europe in 2011 triggers decline in mining sector exports of Indonesia between 2011 and 2012. China's economic slowdown also affect Indonesian exports decline, with economic growth of only 7.7% in 2012 compared to 9.3% of economic growth in 2011. According to the data obtained from the ministry of industry, since the European crisis, statistics show that the numbers of export, particularly the non-oil gas mining sector of metallic mineral mining and coal mining had been in decline for the past 4 years from 2011-2014.

The non-oil gas mining exports of Indonesia gradually in a decreasing trend ever since the global crisis that hit the Europe. From 34.64% in 2011 of exports fell to 31.33% in 2012. Furthermore, the number of exports of mining sector in Indonesia in 2013 did not improve as it fell to 31.16% to actually hit the bottom low in 2014 as the sector could only reach a figure of 22.85% of exports. In 2012, based on data from the ministry of industry, the mining growth sectors increased only by 8.48%. It was far below the performance in 2011, which grew 16.26%. The growth of the mining industry sector in 2013 continued to fall in the range of 4-5%. This situation indicated that actually mining industry in Indonesia has not recovered from the global crisis since 2011.

The situation in 2014 did not improve so much in non-oil gas mining industry as Indonesian government impose a new policy that obliged all non-oil gas mining companies to stop exporting all raw metal ores in exchange of a processed materials productions using smelter. The new policy was expected to improve the income Indonesia can get by forcing the miners to process their ore before exporting. However, according to statistics of the ministry of mining industry, this policy did not seem to produce a positive trend as the numbers of export continued to decline of up to 9.2 per cent of total exports of goods of the non-oil gas mining sectors, which is sufficient to provide a significant loss to the state revenue. The officials are worried by the condition of post global financial crisis which latter added a new problem of new government regulation which consequently increased the current deficit account, which may damage the investors' confidence, and possibly affect the value of rupiah in the worst possible scenario. Subsequently, more than 100 non-oil gas mining companies were in financial distress conditions or forced to shut down their operations in 2014 (Deutsche, 2014).

Even though the oil and gas mining subsector was not affected by the government regulation of exporting raw materials, the oil and gas mining sector had also not been in a better condition than the previous stated sector post global financial crisis in 2011. Currently, Indonesia is on the brink of oil crisis. Oil and gas reserves owned by Indonesia only last for about 14% of total which is no longer adequate. Within 30 years, Indonesia's oil reserves have slumped 68 percent. This is the sharpest decline in oil reserves and rapidly in Asia. Large blocks which have been the mainstay of Indonesia's oil production is getting older with decreased levels of productivity. Various methods and technologies for optimizing production through enhanced oil recovery has been done. However, production of approximately 10

major oil fields managed by the multinational companies still declined sharply (Anon., 2014).

The statistics depict that in 2011 41.48% of exports fell to a figure of 36.98% for the next year. In 2013, the downward trend continued to fall about 4.35% to 32.63% then eventually reached 30.33% in 2014. This statistic indicates as well that after global financial crisis the subsector of oil and gas mining seemed to not recover from its problem. This also lead to a possibility of mining firms of Indonesia in general having financial distress in trying to cope with the post global financial crisis as well as the economic downturn which happened in the last four years of period through 2011-2014.

As various conditions stated above, determining whether the companies are in financial distress or on a fine state would be substantial. The importance of a financial distress identifying model of a company is highly needed by various parties such as lenders, investors, government, accounting, and management. The management team may utilize value of Z-score as an indicator in making a vital strategic decision for the survival of the mining company in the period of financial crisis. The Investors can read it as a useful information in interpreting various relationships and trends that can provide a basis consideration of future predictions whether the mining sectors can survive or not (Khaliq *et al.*, 2014).

This paper is designed to analyze on the possibility of financial distress signal in 18 listed mining companies which consists of three subsectors of metallic mineral mining, coal mining, as well as oil and gas mining sectors in Indonesia. It also comparatively analyze which of the three subsectors of mining in Indonesia is having a better Altman Z-score result which also indicate that the company is in healthy condition and not experiencing financial distress using Kruskal-Wallis SPSS statistical tool. The difference between previous studies with this research is that this study is focusing on three subsectors of 18 mining sectors companies listed in Indonesian stock exchange and it also comparatively analyze which one have a better financial health using Altman Z-Score as the indicator through 2011-2014.

The purpose of this study is to determine which one of the subsectors of metallic mineral mining, coal mining, and oil and gas mining have a better Z-score ratio. Furthermore, this research is also aimed to determine if the mining companies listed in Indonesian stock Exchange are in the financial distress situation or in the verge of bankruptcy.

Literature Review and Hypothesis Development

Related Literature

Bankruptcy prediction has been quite the talking point in this strict competition of business. With the current technology development, the use of bankruptcy prediction models has become practical and accessible for everyone. The difficulty collecting data on the corresponding sets of failed and successful enterprises constitute one of the main problems in developing and testing bankruptcy-forecasting models (Diakomihalis, 2012).

This study refers to the previous studies. Ijaz *et al.* (2013) conducted a research, which uses Altman's Z-Score and current ratio to assess the financial status of sugar sector companies listed at Karachi stock exchange. Total population sampling technique was used in this study and all thirty five sugar sector listed companies at KSE were included in this study to get the deep insights of the issue. State bank's balance sheet analysis and companies' financial reports were used to compile the data for the years 2009 and 2010. Mohammed &

Kim-Soon (2012) also uses Altman Z-score and current ratio to assess the financial status of companies quoted in the Malaysian stock exchange. The population of the study is composed of 44 selected listed Companies of Malaysian stock exchange. The study of Khaliq *et al.* (2014) concerns about the financial distress measurement among 30 GLC's listed companies in Bursa Malaysia over the period of five years (2008 until 2012). The paper addressed the financial distress determinant measured by Z score statistics model which also utilize the current ratio and debt ratio to debt ratio in the process.

Therefore, this study uses Altman Z-Score to assess the financial condition of mining sectors which are divided into three subsectors of oil and gas mining, metallic mineral mining, and coal mining in Indonesian stock exchange. Moreover, this study will conduct a test to determine which of the three subsectors have a better financial health condition with Altman Z-score model as the indicator using Kruskal-Wallis Statistical model.

Despite the declining trend of exports the metallic mineral and coal mining had experienced, metallic mining and coal mining are major contributor to GDP Indonesia. According to the Indonesian central bureau of statistics, since 2011 the percentage of GDP from hard mineral and coal exceed the GDP contribution of oil and gas, this is due to the volume of oil lifting Indonesia continues to decline and a stronger price mineral commodities on the world market, in addition to the huge demand of the commodity minerals from China such as iron, nickel, bauxite and others led to the phenomenon of large-scale production at several mineral commodities (nickel and bauxite) and made Indonesia as the largest exporter of several mineral commodities. This condition can be an indicator that although non-mineral mining sectors were in declining period of exports, metallic mineral and coal sectors were better in condition after post global financial crisis since 2011 (Soelistijo *et al.*, 2015).

Based on the reasons described above, this research propose the following hypothesis:

H1: Metallic mineral mining sector have a better Z-score ratio than oil and gas mining sector.

Furthermore, based on current condition of coal mining compared to oil and gas mining sector, coal mining, given the relatively large national coal reserves compared to oil and gas, coal expected to be the main source of energy Indonesia in the future longer than the oil and gas mining sector. Currently coal is used as fuel power plants and other sources of energy thermal in the industry (coking coal). The future of coal beneficiation is to produce liquid coal to replace liquid fuel demand such as oil. Future coal supply will gradually replace petroleum so the percentage of coal usage is expected to increase from 20% in 2010 to 32% in 2030. National coal demand will be met from national coal reserves which is quite large. In addition to meet domestic demand, coal production is also exported. With backup large enough, demand for coal to market in the country will be able to be supplied from production in country. Imports of coal to date very little because it is only used for special purposes. Domestic demand for coal is used for final energy in the industrial sector and primary energy to power plant (Soelistijo *et al.*, 2015).

Based on the reasons described above, this research propose the following hypothesis:

H2: Coal mining sector have a better Z-score ratio than oil and gas mining sector.

In addition, even though metallic mineral had experienced a lot of problem from the past four in regards with a new policy of using smelter as well as trying to cope with the post global financial crisis and the declining numbers of export, metallic mineral sector have one category of mineral which can adapt to these circumstances, which is gold mining industry. Gold is believed to choose a value that is never eroded by inflation caused gold to get a

special place in world trade and investment is a hedge, uniformity This perception led to the value of gold will continue to firm in the long run. In the hedging function and belief in the value of gold that will never go down in the long run, countries rich in oil-producing excess profits from the sales and rise in oil and coal prices to increase their gold reserves boosting demand and led to the gold price appreciation itself. Conversely, when the price of oil and coal mining down, gold reserves will be released into the market so that the excess supply and the price of gold fell. This behavior was also performed by the business to protect their assets from inflation scour and of the risk of loss for example due to rising production costs due to higher oil and coal prices (Soelistijo *et al*., 2015).

Based on the reasons described above, this research propose the following hypothesis:
H3: Metallic mineral mining have a better Z-score ratio than coal mining sector.

Research Methodology

Sample Selection

The sampling method used is purposive sampling. The implementation of this purposive sampling are as follows: First the characteristics of the population are identified by establishing a preliminary study or by studying a variety of matters relating to population. Then the researcher set to select the members of a sample from the population.
Based on those steps, the sample in this study is determined by the following criteria:
a. Publicly traded 18 mining companies which are divided into three subsectors, metallic mineral mining, coal mining, and oil and gas mining in the Indonesia Stock Exchange.
b. Listed in consecutively from 2011-2014.

Mining companies included in the criteria for the study sample can be seen in the following table:

Table 1

Research Samples

No	Company's Code	Company's Name	Mining Subsectors
1	ADRO	PT Adaro Energy Tbk	Coal mining
2	ANTM	PT Aneka Tambang Tbk	Metallic mineral mining
3	ATLAS	PT Atlas Resources Tbk	Coal mining
4	ATPK	PT ATPK Resources Tbk	Coal mining
5	BYAN	PT Bayan Resources Tbk	Coal mining
6	PTBK	PT Bukit Asam Tbk	Coal mining
7	BRMS	PT Bumi Resources Mineral Tbk	Oil and Gas mining
8	DKFT	PT Central Omega Resources Tbk	Metallic mineral mining

No	Company's Code	Company's Name	Mining Subsectors
10	CTTH	PT Citatah Tbk	Metallic mineral mining
11	DEWA	PT Darma Henwa Tbk	Coal mining
12	ENRG	PT Energy Mega Persada Tbk	Oil and Gas mining
13	PSAB	PT J Resources Asia Pasifik Tbk	Metallic mineral mining
14	MEDC	PT Medco Energy Internasional Tbk	Oil and Gas mining
15	PTRO	PT Petrosea Tbk	Oil and Gas mining
16	RUIS	PT Radiant Utama Interninsco Tbk	Oil and Gas mining
17	ARTI	PT Ratu Prabu Energi Tbk	Oil and Gas mining
18	TINS	PT Timah Tbk	Metallic mineral mining

Variables

The research variables in this study are three independent samples of Altman Z-score mining sector, which are divided into three subsectors of metallic mineral mining, coal mining, and oil & gas mining.

Data Analysis Model

The analytical method used to process the data is by using the method of Altman score is. In determining which of the three subsectors of metallic mineral mining, coal mining, and oil and gas mining have better Z-score ratio, SPSS statistical tool is used with Kruskal-Wallis model. Z-Score calculation begins by finding the necessary data extracted from financial statement of mining companies and then put the value into Z-Score formula to get the value of Z. Altman Z-Score for mining companies that have gone public can be determined using the following formula (Munawir, 2002):

Z-Score = 1.2X1+ 1.4X2+ 0.6X3 + 3.3X4+ 1.0X5

Where:

X1 = Working Capital to Total Assets (Working Capital / Total Assets).
This ratio indicates the company's ability to generate net working capital from the whole of its total assets.

X2 = Retained Earnings to Total Assets (Retained Earnings / Total Assets)
This ratio shows the company's ability to generate retained earnings from the total assets of the company. Retained earnings occurs because the holders of ordinary shares allow companies to reinvest profits distributed as dividends.

X3 = Earnings before Interest and Taxes (EBIT) to Total Assets (Earnings before Net of Interest Expense / Total Assets).
This ratio shows the company's ability to generate profits from the assets of the company, before interest payments and taxes.

X4 = Market Value of Equity to Book Value of Total Liabilities (Stock Market Price / Total Debt).

This ratio shows the company's ability related to the market value of equity capital (ordinary shares). The market value of the equity itself is obtained by multiplying the number of common shares.
X5 = Sales to Total Assets (Sales / Total Assets).

After entering the value into the calculation of Z-Score, the subsequent step is to conduct a data analysis to determine score of Altman Z-score. After the analysis and interpretation of data is done, then this information can be used by users. Z-Score values obtained can be used to predict whether there is any tendency of the 18 mining companies listed through 2011-2014 of having financial difficulty or not. The assessment of Altman Z-score is as follow:
1. Z-score > 2.99 is categorized as a very healthy company that indicates no financial distress.
2. Z-Score < 1.81 is categorized as a company that indicates a very difficult situation where the company is experiencing a severe financial distress and is at high risk of being liquidated or collapsed.

Subsequently, this study will try to identify which of the three subsectors of metallic mining, coal mining, and oil and gas mining have a better financial condition using Altman Z-score as the indicator. The data analysis in this research uses Kruskal-Wallis model with SPSS statistical tool.

The following diagram summarizes the process of data analysis in this research:

Diagram 1

Research Framework
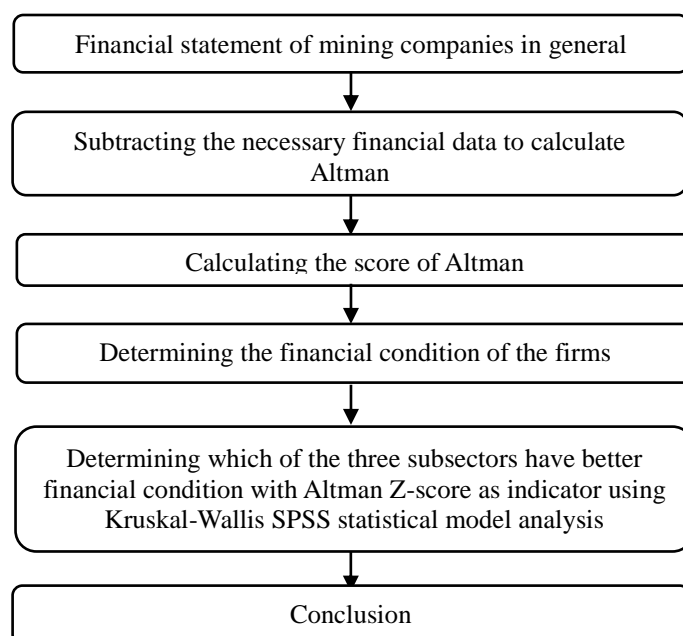
Findings and Discussions

Findings

The following table will show the descriptive statistics of Z-Score on 2011 to 2014 of six metallic mineral mining companies listed in Indonesian stock exchange:

Table 2

Metallic Mineral Mining Z-Score

	Descriptive Statistics			
	N	**Minimum**	**Maximum**	**Mean**
2011	6	0.12	9.27	4.318
2012	6	0.14	11.96	4.4342
2013	6	0.11	7.21	2.7872
2014	6	0.09	5.76	2.2897

According to the table above, it can be seen that the mean of Z-score of six metallic mineral mining companies ranged between the highest averages of 4.4342 to the lowest of 2.2897. Furthermore, the figures also indicate that in the exception of 2012, the mean of Z-score of six metallic mineral companies were in declining trend starting from 4.318 in 2011 declined to 2.7872 2013 and then eventually decreased to a number of 2.2897 in 2014. The minimum and maximum value of Z-score vary between each year, which ranges to a minimum of 0.09 to a maximum of 11.96.

The subsequent table will show the descriptive statistics of six coal mining companies Altman Z-score through the year 2011-2014 which are listed in Indonesian stock exchange:

Table 3

Coal Mining Z-Score

	Descriptive Statistics			
	N	**Minimum**	**Maximum**	**Mean**
2011	6	-0.28	10.83	3.9962
2012	6	0.04	8.34	2.4758
2013	6	0.14	6.48	2.2207
2014	6	-0.49	5.48	1.6765

Data Sources: Processed using SPSS statistical

The descriptive statistics above shows that the average Z-score of six coal mining companies listed in Indonesian stock exchange were continuously dropping from 3.9962 in 2011 to actually hit 1.6765 in 2014. The lowest Z-score of coal mining companies is 1.6765 while the highest Z-score is 3.9962. The maximum Z-score of coal mining sector is 10.83 in 2011 while the minimum is -0.49. This statistical figure indicate that coal mining financial condition based on average z-score were deteriorating since the 2011 to 2014.

The table below will depict the descriptive statistics of six oil and gas mining companies which are listed in Indonesian stock exchange through 2011-2014 standpoint:

Table 4

Oil and Gas Mining Z-Score

		Descriptive Statistics		
	N	Minimum	Maximum	Mean
2011	6	0.29	2.75	1.5678
2012	6	0.39	1.86	1.183
2013	6	-0.16	1.88	1.0627
2014	6	-0.21	1.96	0.9427

Data Sources: Processed using SPSS statistical

According to the statistical figure of descriptive statistic table above, oil and gas mining companies have a very low average of Z-score compared to the previous two subsector, which in this sector revolved around one to zero. Moreover, starting from 2011, financial condition based on the average Z-score were also in diminishing state which scored only 1.5678 to actually reached 0.9427 in 2014. The minimum Z-score of oil and gas mining companies through 2011-2014 is -0.21 while the maximum value of Z-score is only 2.75. This figure also show that oil and gas sector seemed to have the worst average of Z-score.

The following table will show the descriptive statistics of Z-Score on 2011 to 2014 of 18 mining companies listed in Indonesian stock exchange in general.

Table 5

Mining Companies In General Z-score

		Descriptive Statistics		
	N	Minimum	Maximum	Mean
2011	18	-0.28	10.83	3.294
2012	18	0.04	11.96	2.6977
2013	18	-0.16	7.21	2.1488
2014	18	-0.49	5.76	1.6363

Data Sources: Processed using SPSS statistical

Based on the table above, it can be seen that the average of Z-Score of the 18 mining companies gradually decreased since 2011 to the end of 2014 period from 3.294 average to 1.6363. This data further indicate that there is actually a decrease of overall score of Altman Z of 18 mining companies in general which divided into three subsectors of metallic mineral mining, coal mining, and oil and gas mining ever since the post global financial crisis in 2011. The minimum and maximum value of Z-score vary between each year, which ranges to a minimum of -0.49 to a maximum of 11.96

This study uses Kruskal-Wallis hypothesis testing of three independent samples which are the metallic mineral mining Z-score, coal mining z-score, and oil and gas mining z-score to determine which of the three subsectors have the better financial condition based on the Altman Z-score ratio through the years of 2011-2014 period. The following table summarize the result of the hypothesis testing:

Table 6

Kruskal-Wallis Mining Companies Altman Z-Score Result

	Ranks			**Kruskal-Wallis**		**Assumption**	**Alternative Hypothesis**
H1 Altman Z-Score	**Mining**	**N**	**Mean Rank**	**Chi-Square**	**Sig (2-tail)**	Chi Square & Sig (2 tail)	Accepted
	Coals	24	37.88	9.156	.010		
	Metals	24	44.88				
	Gas Oil	24	26.75				
	Total	72					
Chi Square Table = 81.381							

Data Sources: Processed using SPSS statistical

Based on the above result, the chi square table is 81.38 > 9.156 more than chi square statistic, while the significance value probability is 0.010 < 0.05. According to those result, H0 is rejected and H1 is accepted or in other words the null hypothesis is rejected and alternative hypothesis is accepted. It means that there is a significance difference between the average Z-score of all the three subsectors of mining companies in Indonesian stock exchange. Furthermore, it also means that the Altman Z-score of each of the mining subsectors are not identical to each other, and thus it also means that the result of this study is not by chance. In addition, according to the statistics above, metals mineral mining have the highest average of Z-score compared to the other two sectors, which is 44.88 average of Z-score through the years of 2011-2014, while the second highest sector of average Z-score of 37.88 is coal mining sector, and the lowest sector of mining company is oil and gas sector which only scored 26.75 of average Z-score ratio.

In order to determine the financial condition of 18 mining companies listed in Indonesian stock exchange on 2011-2014, the Altman Z-score ratio is used. The following table summarize the financial condition of all the 18 mining companies, which also will be divided into three sectors, metallic mineral mining, coal mining, and oil and gas mining:

Table 7

Financial Condition of Mining Companies

	Metallic Mineral Mining		**Coal Mining**		**Oil and Gas Mining**		**Total**
	In Financial Distress Condition	**Non-Financial Distress Condition**	**In Financial Distress Condition**	**Non-Financial Distress Condition**	**In Financial Distress Condition**	**Non-Financial Distress Condition**	**In Financial Distress Condition**
2011	1	5	1	5	4	2	6

	Metallic Mineral Mining		Coal Mining		Oil and Gas Mining		Total
	In Financial Distress Condition	Non-Financial Distress Condition	In Financial Distress Condition	Non-Financial Distress Condition	In Financial Distress Condition	Non-Financial Distress Condition	In Financial Distress Condition
2012	1	5	3	3	5	1	9
2013	2	4	3	3	5	1	10
2014	3	3	4	2	5	1	12

Table 7 illustrates the condition of 18 mining companies which are categorized under financially distressed and non-financially distressed. The results of Altman Z-score formula shows that in 2011 from 18 mining companies in general, there are six companies which are considered to be in financially distress condition and 12 are considered to be non-financial distress condition. The financial distress companies of mining in general keep increasing from then on, in 2012 from nine companies out of 18, to 10 companies for the next year in 2013, which then eventually reached 12 mining companies in general out of 18 in 2014.

Discussions

Based on the findings of the hypothesis testing result above the first hypothesis that state metallic mineral mining sector have a better Z-score ratio than oil and gas mining sector is supported, as 44.88 is more than 37.88 score. This is because even though the metallic sector have been in a declining period, the metallic mineral sector have a better financial condition post the global financial crisis due to the volume of oil lifting Indonesia continues to decline and a stronger price mineral commodities on the world market, in addition to the huge demand of the commodity minerals from China such as iron, nickel, bauxite and others led to the phenomenon of large-scale production at several mineral commodities and made Indonesia as the largest exporter of several mineral commodities (Soelistijo *et al*., 2015).

Furthermore, based on the result above, coal mining also have a better average Z-ratio compared to the oil and gas mining companies. This also supports the second hypothesis that state coal mining sector have a better Z-score ratio than oil and gas mining sector, as the score of Altman average of coal mining compared to oil and gas mining sector is 37.88>26.75. This is because coal have larger national coal reserves compared to oil and gas, as well as coal expected to be the main source of energy Indonesia in the long run. Coal is used as fuel power plants and other sources of energy thermal in the industry (coking coal). The future of coal beneficiation is to produce liquid coal to replace liquid fuel demand such as oil. National coal demand will be met from national coal reserves which is quite large. (Soelistijo *et al*., 2015).

With backup large enough, demand for coal to market in the country will be able to be supplied from production in country, and in comparison if compared to oil and gas mining sector, the coal industry have better future prospect and reserves. Imports of coal to date very little because it is only used for special purposes. Domestic demand for coal is used for final energy in the industrial sector and primary energy to power plant. The ever changing price of oil and gas mining is also one of the factors why oil and gas mining industry are fragile to the global financial crisis situation.

Moreover, according to the result of Kruskal-Wallis test, metallic mineral seems to have a better financial condition based on Altman Z-score ratio through the year of 2011-2014. This also support the third hypothesis that state metallic mineral mining have a better Z-score ratio than coal mining sector, as 44.88 is more than 37.88. The reason for this is because the existence of a particular category which gives an advantage of a better financial condition based on Altman Z-score, which is the gold mining category. Gold is never affected by inflation in the market, gold is also one of the most volatile category in metallic mining industry in terms of facing the unpredictable market situation. This view led to the value of gold that will continue to triumph in the long run. The value of gold will be boosted if there is an excess profits from the rise of sales in oil and coal prices, which eventually will lead to a growth of gold demand which makes the gold mining category even more promising. Because of this, the metallic mineral mining have a better financial condition compared to the other two sectors of mining, which are the coal mining and oil and gas mining sector.

Hence, even though in general mining industry had been in decline for the past four years, oil and gas mining sector seemed to be the sector that were experiencing financial difficulty the most compared to the other two sectors of metallic mineral and coal mining. Coal mining sector are in the second place of highest average of Z-score, while the metallic mineral mining sector is the most volatile sector after the global financial crisis in 2011 based on the Altman Z-score indicator.

In addition, the findings calculation of Altman Z-score shows above shows that the number of mining companies having financial distress vary between each sectors, with oil and gas mining sector have the highest number of companies experiencing financial distress situation and metallic mineral the lowest number that experience financial difficulty. Based on the figures, however, is that all of the three mining subsectors had a rise in financial distress companies year by year. Metallic mineral mining from only one company out of six through 2011-2012 to actually increased to two and three companies through 2013 and 2014 respectively. Coal mining sector also started from only one company which had financial distress signal in 2011, to actually increase to three companies in 2012 and 2013, with 2014 was the worst year for this coal mining sector in regards with having four companies out of six experiencing financial difficulty. The oil and gas sector, which holds the highest number of companies experiencing financial distress, started from four out of six companies experiencing financial distress in 2011. In 2012 until 2014, almost all of the six company in the exception of one company were experiencing financial difficulty. This further indicates that ever since the post global financial crisis, the mining industry in general, especially companies listed in Indonesian stock exchange through 2011-2014 were gradually experiencing an increase of financial difficulties.

Conclusions

The result of this study shows that based on the average score of Altman model through 2011-2014, it can be concluded that from the three subsectors of mining which are metallic mineral, coal, and oil and gas mining, metallic mineral have better Altman Z-score ratio than coal , oil and gas mining. This is because the metallic mineral sector have gold mining category which is volatile in a difficult market circumstances as well as a better financial state post the global financial crisis due to the volume of oil lifting Indonesia continues to decline and a stronger price mineral commodities on the world market, in addition to the huge demand of the commodity minerals from China such as iron, nickel, bauxite and others. It can

also be concluded that coal have better Altman Z-score ratio compared to oil and gas mining sector. This is because due to the declining oil and gas lifting and the condition where coal mining prices rises due enormous demand from industrialized countries.

The analysis result of Altman Z-score also shows that through the years of 2011-2014, there is an increase on the number of financial distress condition companies from only six companies out of 18 companies in 2011 to 12 companies out of 18 companies in 2014. It can also be concluded that the numbers of metallic mineral mining, coal mining, and oil and gas mining companies who were experiencing financial difficulties increased each year by year through 2011-2014. The reason for this is because of some difficult situation each of the sectors were experiencing as well as Indonesian mining sector is still trying to adapt the financial situation they are facing after the global financial crisis in 2011.

The limitation of this study is in the collection of the necessary financial data of the related mining companies processed using Altman Z-score. Some periods in 2011-2014, there are mining companies which do not have Altman Z-score calculation component such as sales, and short term obligations. Moreover, there is a limitation of trying to find three different subsectors of mining consisted of metallic mineral, coal, and oil & gas mining listed in Indonesian stock exchange consecutively from 2011-2014 period, which this research only limited to six of each three subsectors.

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