CORRELATION ANALAYSIS OF MARKET PERFORMANCE AND BANKRUPTCY RISK (CASE OF HEALTHCARE SUBSECTOR COMPANIES LISTED IN INDONESIAN STOCK EXCHANGE PERIOD 2015 - 2018)

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Abstract. *Financial distress is an essential problem that would cause some bad effects for the companies. The companies' management might not expect the risk earlier since their companies are in a good performance. However, financial distress can be happened to both of the good performance company and the bad performance company. Healthcare companies must focus on how they could attract more investors to be ready for the bankruptcy threat. Within the tough competition between companies, investors are also looking for the best company they could invest in and one of the perspectives in doing such decision is by observing the market performance. To solve the problem faced by both companies and investors, this study aims to develop the Altman's Z-score model as the depiction of bankruptcy probability by observing its relationship with companies' market performance using the correlation analysis by having stock price, share return and trading volume as the variables. The test result indicates that there are significant correlation between bankruptcy risk and return also bankruptcy risk and trading volume while there are no significant correlation between bankruptcy risk and stock price. Investors afterwards are recommended to use this findings to predict the condition of healthcare companies for preferred investments.*

Keywords: *Financial Distress, Bankruptcy, Healthcare, Market Performance, Altman's Z-score, Correlation Analysis*

INTRODUCTION

Healthcare is an industry that comprises of providers of diagnostic, preventive, remedial, and therapeutic services such as doctors, nurses, hospitals and other private, public, and voluntary organizations. The industry is considered one of the new subsector available for the buyers in the stock market. We can see from the Indonesian Stock Exchange (IDX) data that there are 4 private owned hospitals in Indonesia that has been listed which are Mitra Keluarga Karyasehat Tbk (Mitra Keluarga Hospitals), Sarana Meditama Metropolitan Tbk (OMNI Hospitals), Siloam International Hospitals Tbk (Siloam Hospitals) and Sejahteraraya Anugrahjaya Tbk (Mayapada Hospitals). There are still so many potentials lies ahead of the healthcare industry in Indonesia. Healthcare market is very promising that it is predicted the value of the industry would raise to $32.5 million in 2022 (Ken Research, 2018).

To take advantage of the very promising potential, it is very crusial for Indonesia to maintain positive momentums of the investment in the healthcare subsector (Fadil, 2018). Government has done some breakthrough to face the problem such as the ratification of the President's Instruction number 6 year 2016 about the development acceleration in the industry of pharmacy and health equipment. The minister of health affairs has also said that ambassadors overseas has to escort the positive trends in the investment of healthcare subsector.

Furthermore, Based on the previous statement of the importance of investment, there is one thing that has to be thought: the thing that could give impact to the investors decision in choosing the best industry or company to invest their money in. Investors personal behaviour played a part on implicating the decision, along side with the value of the corporation and its stock market performance (Fahlenbrach, 2009). These perspective that is used by investors are related to the company's financial condition, which are expected to portray the probability of the company to sustain in the business and therefore give the investors their expected return.

LITERATURE REVIEW

Financial Distress and Bankruptcy

Financial distress is a situation where insufficentcy of corporate operation cashflow is happening that the corporate's liability such as interest cost or trade credit could not be fulfilled therefore the corporate is subjected to do refinement (Wruck, 1990). Neglecting contracts, getting involved in restructuring stakeholders' finance (e.g. creditors or inter-company) and equity rights of investors' would be the cause of this situation. Financial distress could be corporate's early warning as a signal of matters. More extensive corporate liabilities means earlier experience of financial distress. Nevertheless, earlier experience of financial distress

may also favor the corporate that it gives more time to do reorganizing and restructuring in their own initiative. Yet, if the corporate can not relieve the situation, eventually it can lead to bankruptcy.

Altman's Z-score
In 1968, An Assistant Professor of Finance at New York University named Edward I. Altman developed a model of formula which is able to predict the bankruptcy probability of a firm within two until three years time period in advance. The model, called Altman's Z-score, measures the financial health of a business firm by implementing discriminant analysis and using five basic financial ratios as the inputs (Calandro, 2007). The model has been proven to be a trustworthy instrument in predicting the failure of various mix of business entities.

Previous Research
Mello-e-Souza (2001) explained the bankruptcy risk-return paradox based on Dichev's paradox (1998). The sample of the test is industrial firms incorporated in the United States, listed in NYSE, AMEX and NASDAQ, covering the period of 1973 to 1998 and empirically tested with the method of sorted portfolio and cross-sectional regression. He has discovered that in practice, a simultaneous decrease in the correlation between the market and portfolio as the probability of bankruptcy approaches one. This event is strong enough to produce a sharp decrease in systematic risk and in expected return, becomes a clear meaning of the inseparable association of the market and bankruptcy risk (Mello-e-Souza, 2001).

Hofer and Carton (2006) made a study in measuring organizational performance. They took the sample of US-stock exchange traded companies that must have financial information that is readily observable and used the split-half and test-retest method. The study was conducted by examining commonly used performance metrics such as return on assets, return on equity, sales growth rate, residual income, cash flow and expenses. The study stated that Altman Z-score was providing the greatest relative information about market-adjusted return to shareholders (Hofer & Carton, 2006).

He (2002) was doing an investigation about market behaviour and financial of small firms from the OTC market. the investigation also studies its contribution to the small firms business failures prediction by using the method of multivariate determinant analysis. The study which applies Shumway's model to small firms suggest that the market may recognize bankruptcy years before firms file for bankruptcy. Market continually downgraded the firm's value by increasing risk and decreasing return to reflect those unfavorable firm-specific factors (He, 2002).

Michel, Shaked and McHugh (2002) indicates that the market significantly and early differentiates between one- and two-time filers through a study of comparison of the return earned and operating results of those two firms. The firms tested are Tracor Inc. and Harvard Industries Inc. on 2002. The positive market results for one-time filers are surprising although poor operating results while negative market result for two-time filers shows that the market did not anticipate the extent of firm negative operating results. Cumulative returns differ largely and increasing overtime, with the increase for one-time filers and decline for two-time filers (Michel, Shaked, & McHugh, 2002).

In his paper, Ming (2002) explained the relationship between stock return and bankruptcy risk with the sample of 2028 Japanese firms in the period of 1980 to 2000 using Fama-MacBeth regression method. The study found and indicate that higher expected return have impact to the bankruptcy risk on average thus creating a significant positive relationship between bankruptcy risk and stock return (Ming, 2002).

Research Hypotheses
The researcher has made the following hypotheses based on the formulation of the problem:
H_1: Stock price has significant relationship on the Altman's Z-score of the healthcare companies listed in Indonesian Stock Exchange.
H_2: Stock return has significant relationship on the Altman's Z-score of the healthcare companies listed in Indonesian Stock Exchange.
H_3: Company's trading volume has significant relationship on the Altman's Z-score of the healthcare companies listed in Indonesian Stock Exchange.

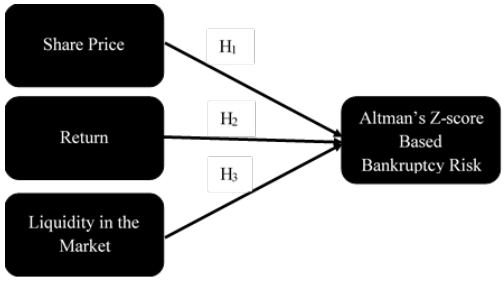

Figure 1. Research Framework

METHODOLOGY

Research Variables

There are a total of four variables in this research which are:

a. ***Z-score***

The Z-score of the four Indonesian healthcare companies are picked from the year 2015 to 2018. The fact that healthcare sector is considered as non-manufacturer sector becomes the reason the researcher used the revised Altman's Z-score model to find the score.

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

Equation 1. Altman's Z-score Model for Non-manufacturer Company (Altman, 1983)

Where

X_1 = Working capital / Total assets

X_2 = Retained earnings / Total assets

X_3 = Earnings before interest and taxes / Total assets

X_4 = Market value of equity / Book value of total liabilities

Z' = Overall Index

b. ***Stock Price***

Stock price is the price of a single saleable and buyable share of a firm, derivative or other financial asset and product. Eventhough unpredictable, many different perspectives of investors may be indicated through stock price, while most of the perspective is seeing the stock price as the present value of the firm's cash flow in the future followed by expected future earnings.

c. ***Stock Return***

Return is the total income (or loss) earned by an investment over a specific period and often expressed as a percentage of the invested amount. As well as stock price, different approach and perspective is used by different investor in defining and analyzing the stock return. Usually stock return provides the perspective and hint on how much income could be obtained in the future. The perspective of risk that follows the investment can also be depicted from the stock return.

d. ***Trading Volume***

Trading volume is the number of a stock (or a portfolio or even the entire market) that were traded in a period of time. The volume defines the firm's liquidity in the market. higher liquidity and better order execution can be portrayed by the higher volume.

Data Processing and Analysis

After collecting the data, the study may proceed by examining the Z-score of each period of time for each company being studied and then to be ranked by using the average Z-score over all of the result. Next, analyze the Z-scores using the SPSS statistic tools version 23 and conduct the Pearson's correlation analysis to discover the relation between each Z-scores of the spesific company with its market performance variables also to find how significant does the relation of each pair using their coefficient of correlation.

FINDINGS AND ARGUMENT

The Z-score during the period is being averaged to be used as a comparation between the companies' position regarding their bankruptcy score. The score can be classified into The Zones of Bankruptcy which consists of the Safe, Grey and Distress zone. When the Z-score lies above 2.6, it means that the company is considered to be in the safe zone. Meanwhile, the grey zone is when the score lies between 1.1 and 2.6 then finally below 1.1 is considered to be the distress zone.

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Table 1. Rank of Healthcare Companies Listed in IDX during 2015 – 2018 Based on Z-Score

Rank	Company	Average Z-Score	Zone
1	PT Mitra Keluarga Karyasehat	13.13	Safe
2	PT Siloam International Hospitals	5.21	Safe
3	PT Sarana Mediatama Metropolitan	2.46	Grey
4	PT Sejahteraraya Anugrahjaya	1.92	Grey

The correlation coeffient (Rs) between Z-score and stock price is recognized to be 0.057. From this number we can come up to several analysis regarding the research objectives. The correlation strength between the variables is classified as very weak since it is on the range of 0.00 to 0.19. The hypothesis testing shows us that the R table (0.482) is higher than the Rs (0.057), accepting the Ho meaning that the correlation between the variables is not significant. The determination coefficient means that Z-score is only affecting stock price by 0.32%. From the analysis we can sum up that the correlation between Z-score and stock price is not significant and very weak in strength.

The correlation coeffient (Rs) between Z-score and return is recognized to be -0.502. From this number we can come up to several analysis regarding the research objectives. The correlation strength between the variables is classified as moderate since it is on the range of 0.40 to 0.59. The hypothesis testing shows us that the Rs (0.502) is higher than the R table (0.482), rejecting the Ho meaning that the correlation between the variables is significant. The determination coefficient means that Z-score is affecting return by 25.20%, where another variable except Z-score contributed the remaining 74.80%. From the analysis we can sum up that the correlation between Z-score and return is significant and has a moderate strength.

The correlation coeffient (Rs) between Z-score and trading volume is recognized to be 0.700. From this number we can come up to several analysis regarding the research objectives. The correlation strength between the variables is classified as strong since it is on the range of 0.60 to 0.69. The hypothesis testing shows us that the Rs (0.700) is higher than the R table (0.482), rejecting the Ho meaning that the correlation between the variables is significant. The determination coefficient means that Z-score is affecting trading volume by 49.00%, where another variable except Z-score contributed the remaining 51.00%. From the analysis we can sum up that the correlation between Z-score and trading volume is strong and significant.

Table 2. Correlation Analysis Summary of Healthcare Companies Listed in IDX during 2015 – 2018

Variable	Rs	Correlation Strength	R Table	Significance	Determination Coefficient
Z-score and Price	0.057	Very Weak	0.482	Not Significant	0.32%
Z-score and Return	-0.502	Moderate	0.482	Significant	25.20%
Z-score and Trading Vol	0.700	Strong	0.482	Significant	49.00%

CONCLUSIONS

The correlation coefficient shows that correlation strength between Z-score and stock price is classified as very weak. The hypothesis testing shows us that the correlation between the variables is not significant. The determination coefficient calculation result of 0.32% means that Z-score is only positively affecting stock price by 0.32%. It can be concluded that the correlation between Z-score and stock price is not significant and very weak in strength, therefore both variables could not be used to predict each other.

The correlation coefficient shows that correlation strength between Z-score and return is classified as moderate. The hypothesis testing shows us that the correlation between the variables is significant. The determination coefficient calculation result of 25.20% means that Z-score is negatively affecting return by 25.20%. It can be concluded that the correlation between Z-score and return is significant and has a moderate strength, therefore both variables could be used to predict each other.

The correlation coefficient shows that correlation strength between Z-score and trading volume is classified as strong. The hypothesis testing shows us that the correlation between the variables is significant. The determination coefficient calculation result of 49.00% means that Z-score is positively affecting trading volume by 49.00%. It can be concluded that the correlation between Z-score and trading volume is strong and significant, therefore both variables could be used to predict each other.

Based on the observation and research, companies with good Z-score tend to be reflected by good financial condition. This should lead to the final verdict that improving financial performance and business activity is one of the essential effort that companies could do to diminish the risk of bankruptcy that would occur and in the same time increasing its value in the perspective of stakeholders, particularly the investors.

Financial condition of companies would also resembles its performance in the market as the market continuously gathers information about the companies. Highest benefit is fundamentally the prize that is seeked by investors therefore investments in such companies with healthy financial condition is suggested. Through this study, investors are given the recommendation to deftly predict the condition of a healthcare company by examining a single factor that is demonstrated to be either the bankruptcy risk which is displayed by the Z-scores or the market performance which is displayed by the return and trading volume.

Despite the results, further research on the particular subject should be considered on account several limitations of this study. First, this study only observes the healthcare subsector companies in Indonesia which record and data of their market activities are available completely through the four years of study therefore only four companies are qualified to be taken as subjects. Second, whilst quarter data would offer better output accountability, annual data are being used in the data processing stage and analysis due to the absence of certain quarter data that should have been provided publicly by a couple of particular companies.

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