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Industry Distress Level and Competitor's Annual Stock Return

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ABSTRACT
Previous studies show that bankruptcy announcements have a significant effect towards competitor's stock return around the bankruptcy announcement date. This study tries to fill the gap to investigate whether prior to bankruptcy, distressed firms already have significant effect on other players in the same industry. Thus, this research aims to examine the effect of industry distress level towards competitor's annual stock return in the same industry. This study uses Altman Z Score to measure financial distress and categorized the firms as "distressed" and "non distressed" firms. Moreover, this study employs panel data regression tests to 142 non-distressed firms in 2009-2018 listed in Indonesian Stock Exchange. The results suggest that the effect of industry distress level towards competitor's annual stock return is significant. These findings contribute to the literature on financial distress, contagion effect, financing and investment.

Keywords: *Financial distress, Intra-Industry Information Transfer, Contagion Effect, Financing And Investment.*

1. INTRODUCTION

Economic turbulence due to the United State and China trade war is causing volatility in the world economy. According to the International Monetary Fund (IMF), Indonesia is one of the most fragile countries in Asia's emerging market affected by the United States and China trade war with severe Rupiah depreciation in 2018-2019. Uncertainty in the global economic environment can impose firm fragility and distress levels. Learning from the Asian Financial Crisis in 1997-1998, many firms in Indonesia have gone bankrupt. Based on data from the Indonesia Central Bureau of Statistic (Badan Pusat Statistik), 8.8% of 22,386 Indonesian firms have gone bankrupt in 1997-1998. Moreover, the Global Financial Crisis has caused a slow down and distress in the global economy. Thus, global economic uncertainty is one of the risks that can impose firm distress and bankruptcy. Several prior studies [1], [2], [3], [4] have suggested that bankruptcy announcements can impact their competitor in the same industry by affecting their competitor's stock return.

Bankruptcy announcements are negative information received by the market. Some research shows that bankruptcy announcements not only have an impact on the firm itself but also have an impact on other firms in the same industry. This impact is due to intra-industry information transfer. Firth [2] revealed that this information transfer arises when there is a firm that announces information and at the same time non-reporter firms also get a reaction from the market. According to Kohers [5], extrapolation or transfer of information from reporter firms to competitor firms that are non-reporters in the same industry is caused by investors who have investments in competitor firms (non-reporters) using the available information as assumptions or references to assess the prospect of competing firms (non-reporters) in the same industry in the future.

Benmelech and Bergman [6] suggested that bankrupt firms can cause indirect costs to competing firms (non-reporters) that are healthy, for example by raising doubts among investors or suppliers to interact with firms in the same industry as the bankrupt firms. Investors tend to exercise more control over competitors which operate in the same industry as bankrupt firms. This is because firms in the same industry have similar characteristics so that there is a potential to have the same risk.

Several studies have shown that when there is intra-industry information transfer, there will be contagion effects in the industry. Akhigbe et al [1] found that there was a contagion effect when Enron experienced bankruptcy. Contagion effect that occured is indicated by a significant decline in share prices of Enron competitors in the same industry due to intra-industry information transfers. Kaspereit et al [3] also found that there was a transfer of information in the European banking industry due to operational losses information. Operational loss information is used by investors as an assumption that indicates a bad condition in the Europe banking industry. Lang and Stulz [4] also found that the market value of a weighted value portfolio of bankrupt firms competitors operating in the same industry would decline by an average of 1% at the time of bankruptcy announcements, especially in industries that had a high degree of leverage.

Previous studies [1-4] show bankrupt firms can impose cost to their competitors within the same industry by affecting stock return. However, financial distress in a firm is only a condition that can predict bankruptcy in the future. Thus, bankruptcy will not necessarily occur in firms that are in a distress condition and the question of whether firms that are experiencing financial distress can impact their competitors in the same industry still needs to be investigated.

This study only uses the Altman Z-Score as a reference to financial distress of the company which is one of many prediction models of financial distress using samples of firms from various non-financial industries listed on the Indonesia Stock Exchange during 2009-2018. Altman's model has become very popular and is widely used by researchers to predict bankruptcy. Researchers who use this model include Hayes, Hodge, and Hughes [7] who conducted the same research and applied it to several companies from various specialty retail industries that were carried out for two consecutive years. The results of the research by Hayes, Hodge, and Hughes [7] showed that the results reached an accuracy of 94%. Other studies that use the Altman Z-Score model are Altman, Danovi and Falini [8] to predict company bankruptcy in Italy between 2000 and 2010. Ali and Kim-Soon [9] predicted company bankruptcy in Malaysia for 2008 and 2009. The results of these previous studies show that the application of Altman Z-Scores in predicting bankruptcy is effective with an average accuracy rate of above 80%.

Other than Altman Z Score, bankruptcy can be predicted using other measurements such as the logistic regression model from Ohlson, Zavgren, and Stoskus which can evaluate rapidly changing economic environments. However, the precision when more than 1 year to bankruptcy remains is still lower than models based on discriminant analysis [10]. In addition, Altman Z Score will calculate a set of financial and economic ratios to get a distress prediction context using a multiple discriminant statistical methodology. This is to explore not only the quantifiable characteristics of potential bankrupts but also the utility of a much-maligned technique of financial analysis: ratio analysis [11]. This set of financial analysis is available from financial statements and accessible to the public. Hence, the bad news will be delivered more easily to the public. This study has limitations due to the use of the same Altman Z-Score to all non-financial industries in Indonesia in 2009-2018 so that differences in industry types cannot be controlled in the calculation of financial distress.

This paper attempts to fill the gap in previous studies by investigating whether prior to bankruptcy announcement, distressed firms can already impact their competitor in the same industry. Thus, the objective of this research is to examine the effect of distressed companies on the stock returns of their competitors in the same industry. This study will contribute to the literature by providing evidence of intra-industry contagion effects due to the presence of distressed firms in Indonesia.

The remaining of this paper is organized as follows. The literature review section discusses theoretical and empirical findings related to financial distress, intra-industry information transfer, and contagion effect. Data, samples, and the empirical model are covered in the methods section. The findings are presented in the result and discussions section, while the last section concludes the paper.

2. LITERATURE REVIEW

2.1 Financial Distress

Platt and Platt [12] explained that the risk of bankruptcy or liquidation is marked by a decrease in financial condition or financial distress where the firm is weak in generating profits or has a tendency to experience a deficit. Therefore, firms experiencing financial difficulties will have more difficulty to obtain external funding. Financial distress occurs as a prediction that bankruptcy will be experienced by the firm in the future. Foster (1988) defines financial distress as a severe liquidity problem that cannot be solved without changing the scale of the firm's operations or firm structure. Meanwhile, according to Hofer [13] the firm is experiencing financial distress if the firm suffers losses due to failure to run business operations and cash flow that is smaller than long-term debt for several years.

Altman found the popular model called Altman Z Score. Altman uses financial ratios that are considered the most suitable to predict financial distress in manufacturing companies in the United States. Next,

Altman made modifications to the model by adding several new indicators. From the changes that have been made, the Z Score model becomes more accurate so that it can be applied to companies other than the manufacturing industry. The Altman Z (Zeta) model discovered by Edward I. Altman in 2000 [11] is:

$$Z' = 0.717X1+0.847X2 +3.107X3 +0.420X4 +0.998X5 \quad (1)$$

Z = Zeta (Z-Score); X1 = Working Capital / Total Asset; X2 = Retained Earnings / Total Asset; X3 = Earnings before Interest and Tax / Total Asset; X4 = Book Value of Equity / Total Liabilities; X5 = Sales / Total Asset

And Altman Z Score [14] for Emerging market is:

$$Z' = 6,56X1 + 3,26X2 + 6,72X3 +1,05X4 \quad (2)$$

Z' = Zeta (Z-Score); X1 = Working Capital / Total Asset; X2 = Retained Earnings / Total Asset; X3 = Earnings before Interest and Tax / Total Asset; X4 = Book Value of Equity / Total Debt

Z Score interpretation are as listed below :

a. Z-Score > 2,90 means the firm is in healthy condition
b. 1,22 < Z-Score < 2,90 means the firm is in grey area (in the middle of healthy and distress condition)
c. Z-Score < 1,81 means the firm is experiencing financial distress

2.2 Intra-Industry Information Transfer

The occurrence of intra-industry information transfer is caused because there is a company in an industry announcing information and then another company in the same industry gets the same reaction from the market due to the announcement [2]. The information that was announced is used by investors for the prospects of the industry as a whole so that it had an impact on other companies in the same industry [5]. This is done by investors because they assume that companies operating in the same industry have a tendency to have similar characteristics with each other so that what happens in a company in the industry can occur in other companies in the same industry. Related companies engaged in the same industry have the possibility to have a similar pattern so that companies operating in the same industry have an indication of the similar situation with the company that announced the information. Therefore, investors use the assumption from that information to assess the condition of the industry in which the company carries out operations.

Intra industry information transfer can be divided into two types based on the direction of the reaction experienced by non-reporter companies, namely contagion effect and competitive effect. Contagion effects occur when non-reporter companies experience the same reaction as reporter companies [15]. For example, when a company declares bankruptcy, another company operating in the same industry experiences a negative reaction from the market due to the announcement. While competitive effects occur when non-reporter companies experience different reactions from reporter companies that go bankrupt. This reaction can be in the form of an increased market share due to the distribution of market shares (due to announcements) from reporter companies that went bankrupt to healthy non-reporter companies.

However, in 1996, Akhigbe and Madura [1] conducted a study and found that the magnitude of contagion and competitive effects on the healthy non-reporter companies in the same industry could be different because of several factors. Company size can be a measure of how much influence and strength of a reporter company in the industry [5]. An announcement made by a large company will give a greater signal to the market so that competitors in the same industry will get a more significant market reaction, both in the form of contagion and competitive effect. Akhigbe and Madura [1] also stated that information announcements made by large companies will have a greater effect on other players in the same industry so that investors who are aware of the information will assume that the conditions that occur in reporter companies with larger company size will occur to its competitors in the same industry in the future. In the end the conditions that occur are considered as conditions that describe the situation in the industry as a whole.

2.3 Contagion Effect

Laux et al [15] research concluded that contagion effect arises if the reaction received by a non-reporter competitor is the same as a company that announces information in the same industry. Contagion effect is caused by the same characteristics of companies operating in the same industry, for example the similarity of product and resource markets so that there is a tendency for conditions that occur in companies in one industry to be experienced by other players in the same industry. Lang and Stulz [4] state that the contagion effect on an industry arises because companies within the same industry also have the same cash flow characteristics as reporter companies. Laux et al [15] also explained that the contagion effect occurs because companies operating in the same industry usually have the same resources, production process, or labor. Therefore, the conditions experienced by one company in the industry have a tendency to be faced by other companies in the same industry as well. Laux et al [15] further explained that if an industry has imperfect competition, the contagion effect that occurs can also result in a shift or movement in the balance of competition in the industry.

Several previous studies concluded that the contagion effect is experienced by competitors operating in the same industry as a company that announces information. Lang and Stulz [4] conducted a study of an impact from bankruptcy announcement on stock prices and the results showed that after bankruptcy was announced, other companies in the same industry experienced losses in the form of a decline in share prices. Lang and Stulz's [4] research was carried out by taking samples of all bankruptcy announcements from January 1970-December 1989 from companies with debts more than 120 million dollars (59 announcements) taken from COMPUSTAT. This contagion effect occurs because investors use the announced information as an assumption that describes the condition of an industry as a whole. These investors' assumptions then caused a decline in the share prices of competitors (non-reporters).

Akhigbe et al [1] examined the impact of Enron bankruptcy and showed that there is an intra-industry information transfer in the industry where Enron is operating. This intra-industry information transfer is indicated by the decline in the share prices of other companies in the same industry as Enron in the United States. Kaspereit et al [3] research also concluded that there is an intra-industry information transfer due to the announcement of operational losses. Kaspereit et al [3] conducted research on the banking industry in Europe and found that the contagion effect that occurs due to intra-industry information transfer is in the form of negative stock returns experienced by competitors in the same industry. This is because operational losses are considered a bad condition that occurs in the banking industry.

3. RESEARCH METHODOLOGY

The contagion effect occurs because investors use the announced information as an assumption that describes the condition of an industry as a whole [1], [2], [3], [4]. In addition, due to having the same risks, competing companies operating in the same industry with companies experiencing bankruptcy also have the potential to experience decreased share returns due to intra-industry information that creates negative signals in the industry to investors. This investors' assumption then causes a decrease in the share price of competitor companies (non-reporter) with the potential contagion effect due to bankruptcy announcements as found in previous studies [1], [2], [3], [4]. Several prior studies [1], [2], [3], [4] proved that bankruptcy announcements can impact their competitor in the same industry by affecting their competitor's stock return and bankruptcy announcements serve as bad news within industry. The transfer of information within the industry is caused by a company in an industry announcing the information, then other companies operating in the same industry get a reaction from the market due to the announcement [2]. The announced information is used by investors for overall industry prospects so as to have an impact on other companies in the same industry [5].

Companies that experience financial distress are not necessarily declared bankrupt. However, it serves as bad news towards investors as well. The proportion of distress companies within each industry will determine the size of bad news received by investors. This is because financial distress in a company is a condition that predicts the occurrence of bankruptcy so that bankruptcy does not necessarily occur in companies that are in distress [12].

This study will examine further regarding contagion effects in an industry. The contagion effect that will be studied is the influence of the companies experiencing financial distress on the non-financial industry in Indonesia from 2009-2018 on the impact of stock return on competitor companies operating in the same industry in Indonesia.

This study tested 142 companies. The selection of the tested companies is done by dividing the two categories of population companies into the distress and non-distress categories using Altman Z Score. Companies included in the non-distress category in the non-financial industry in Indonesia during 2009-2018 will be selected and tested based on the research model which will be explained further in the next point. Companies that experience distress with Altman Z Score lower than 1.81 at least 1 time in the period 2009-2018 will be grouped into the distress category. While those who have never experienced a distress condition with Altman Z Score greater than 2.9 or between 1.22 and 2.90 during 2009-2018 will be grouped into the non-distress category. This study uses the same Altman Z-Score which was created for manufacturing firms for all non-financial so that the type of industry cannot be controlled in the calculation of financial distress. Then, we will calculate how much the proportion of companies included in the distress category in each non-financial industry from 2009-2018. The model to test the significance of the level of industrial distress on the annual stock returns of competitors operating in the same industry as follow:

$$\Delta Rijt = \beta 0 + \beta * distressijt + uijt \quad (3)$$

Where ΔR is the annual stock return of company i in year t and industry j and distress is the proportion of the number of companies that experience distress in each industry. Business success will also determine how much dividends are paid and the price of shares that will occur in the market. However, business success will be related to a broader scope, such as the economic and industrial environment in which the company does business (Bodie et al, 2009). Hence, other variables that

affect annual stock returns are the level of distress of the company itself, the size of the company, exchange rate, as well as Indonesia Gross Domestic Product growth so that these variables will be used as control variables (u).

Table 1. The result for model test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.408557	0.417377	-0.978867	0.3278
X1	-0.204299	0.180348	-1.132808	0.0257
C1	-0.003252	0.003103	-1.04802	0.2948
C2	-0.046758	0.039685	-1.178226	0.2389
C3	-2.163017	0.321478	-6.728348	0.0000
C4	23.49313	4.603611	5.103196	0.0000

Y = ΔR; X1 = *Industry distress level ;* C1= control variable: Altman Z Score ; C2= control variable: size ; C3= control variable: foreign exchange rate ; C4= control variable: Indonesia Gross Domestic Product (GDP) growth

The hypotheses that will be tested simultaneously in this test are as follows:

Ho: the proportion of distress in an industry does not have a significant effect on the annual stock returns of a competitor operating in one industry

H1: the proportion of distress in an industry has a significant influence on the annual stock returns of competitors operating in the same industry

4. RESULTS

Using Altman Z-Score 2000 and 2005, it was found the largest proportion of industrial distress was found in the infrastructure, utilities, and transportation industries in 2012-2015 with a proportion of 75%. The largest average from 2009-2018 was also found in the infrastructure, utilities, and transportation industries with 56% from a total of 24 companies. The average financial distress per year increased rapidly in 2011 to 38% from 0.0% in 2009-2010. Then since 2011 it was quite stable until 2014 even though it had experienced a surge in 2012 reaching 41%. The level of distress was higher in 2012 and decreased in 2013 and 2014. However, there was an increase back in 2015 to 41% and continued to increase until 2018 reaching 44% - 45% which is the highest distress level since the last 10 years.

The result for model test shows that the proportion of distress in an industry has a significant effect on the annual stock returns of competitors in the same industry.

5. DISCUSSION

Based on the results of this study by conducting a regression test of the level of industrial financial distress with annual stock returns, it is found that there is a significant effect. These results are in accordance with the hypothesis being tested. The negative direction of the industry distress level variable indicates that the higher the industry distress level, the stock returns of competing companies operating in the same industry will decrease and the effect will be significant if partially tested. This shows that investors use the assumption that financial distress information released by non-financial companies in Indonesia to assess the condition of the industry in which the company carries out operations. Information about financial distress that can be analyzed in the financial statements then causes a contagion effect in the non-financial industry in Indonesia. Contagion effects occur in the form of a significant influence on the stock returns of competing companies operating when several companies in the same industry are faced with financial distress.

Decision making regarding investment will be greatly influenced by the emotional condition or psychological condition of each investor. If we incorporate behavioral factors into the decision-making process, irregularities will occur, such as investor preferences, herding behavior, overreaction / underreaction, and so on. Therefore, the level of industry distress can be an information that affects the behavior of investors and ultimately investors predict that competing companies in the same industry tend to have the same conditions. In accordance with several previous studies, there is a transfer of information between industries which causes a contagion effect when more companies experience financial distress. Previous research has shown that bankruptcy information is used by market players such as investors to assess the prospects of competing companies in the same industry in the future [13]. This assumption is used because investors assume that companies in the same industry have the same characteristic tendencies and cash flow so that what one company is experiencing will happen to other companies in the near future.

This study uses 4 control variables in the model, namely the financial distress described by the Altman Z Score of each company, the size of the company, exchange rate, and Indonesia Gross Domestic Product growth. After being tested for significance, the two control variables in the model which are Altman Z Score of each company and size of the company do not have a significant influence to explain the annual stock returns of competitors in the same industry as companies that experience financial distress. This can be caused by the two control variables being the specific variables of each company's character, while stock return is influenced by other factors outside the company's own characteristic factors such as industry and macroeconomic conditions. The other two control variables, exchange rate and Indonesia Gross Domestic Product growth, have a significant impact on competitor's annual stock return. It is assumed that

external factors are more dominant in influencing investment activities in Indonesia during 2009-2018.

6. CONCLUSION

The results of this study shows that the level of distress in the non-financial industry in Indonesia has a significant effect on the annual stock returns of competitors in the same industry. These results are in accordance with research hypotheses and previous studies that the presence of distress information can affect the stock returns of competing companies operating in the same industry. The control variables used in this study are the financial health of each company as measured by the Altman Z Score, the size of the company as measured by total assets, exchange rate, and Indonesia Gross Domestic Product growth. However, the results of the study show that Altman Z Score and the size of the company variables cannot explain annual stock returns of competing companies operating in the same industry as companies that experience financial distress. While external factors such as exchange rate and Indonesia Gross Domestic Product growth have significant impact on annual stock return. This is allegedly due to factors that can influence the company's annual stock returns such as macroeconomic and global factors that can be a threat to investors and creditors to provide funds to the company.

Suggestions for further research include using another bankruptcy prediction model because this study only uses the Altman Z Score as a reference for the company distress level, which is one of the bankruptcy prediction models for a company. In addition, further research can be done on a broader population coverage, for example by comparing the conditions of Indonesia and other countries.

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