THE EFFECT OF BANKRUPTCY POTENTIAL ON STOCK PRICES OF MANUFACTURING COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE

Relita Lamriris[a], Poppy Nurmayanti[b], Azwir Nasir[c]
[abc]*Universitas Riau, Indonesia*
relita115@gmail.com

ABSTRACT

The purpose of this study is to analyze the impact of bankruptcy potential on stock prices of manufacturing companies listed on the Indonesian Stock Exchange with the use of the Zmijewski method (X-Score). The study methodology employed a quantitative descriptive approach, which was then processed and analyzed for concluding results. The study population comprises manufacturing companies listed on the Indonesian Stock Exchange between 2017 and 2021. The sample selection criteria were predetermined, resulting in 104 companies being selected over a 5-year observation period. The data analysis technique used a regression approach and processed using the Eviews program. The regression analysis of the panel data reveals a negative influence of the bankruptcy potential (X-Score) on stock prices with company size and the COVID-19 period as a control variable.

Keywords: Zmijewski (X-Score), Stock prices, Company size, Covid-19 Period

INTRODUCTION

The crucial turning point in the Indonesian stock market occurred when COVID-19 started spreading worldwide in early 2020, triggering negative sentiment among investors. The IHSG plummeted to its lowest level at around 3,900 in March 2020 due to concerns about the risks of a sharp economic slowdown. As time passed, the IHSG gradually recovered from the impact of Covid-19. However, the negative sentiment has not entirely dissipated as historically, the condition of the Composite Stock Price Index (IHSG) during the years 2020 and 2021 remains relatively volatile (able to suddenly rise and soon after fall). Adieb, M (2022) identified 4 industrial sectors most impacted during the COVID-19 pandemic which includes tourism, airlines, manufacturing, and SMEs. Manufacturing industry performance significantly declined with the Manufacturing PMI (Purchasing Managers' Index) plummeting from 51.9 to an all-time low of 27.5 in April 2020 (Anwar M, 2020). The decrease in PMI aligns with the report by Badan Pusat Statistik (2021) on the decline in the Composite Stock Price Index (IHSG) in the manufacturing sector, with the lowest figure occurring in March 2020.

The decline in stock prices and financial performance will have a far-reaching impact, causing Indonesia's economy to falter. The uncertain economic conditions in Indonesia result in a high risk for companies to experience financial difficulties or even bankruptcy. Incorrect predictions regarding the future sustainability of a company can have fatal consequences, such as loss of revenue or investments made in the company. Financial instability within a company can lead to investor skepticism in bidding high stock prices, causing them to avoid stocks of companies with indications of bankruptcy. Investors assume that companies with a potential for bankruptcy will generate lower profits from their purchased stocks. This practice is employed to avoid losses if the company fails to tackle financial issues and ultimately goes bankrupt (Warsono, 2010). Companies that have gone bankrupt will likely have low stock prices. It is essential for investors to avoid investing in companies that have suffered from bankruptcy and the resulting decrease in stock value (Safira, 2019).

Several models have been used by researchers (Altman E, Springate G, Zmijewski M, Ohlson J) to measure the level of financial distress in companies, namely the Altman Z-Score, Springate, Zmijewski, and Ohlson models. The Altman Z-Score model is one of the most frequently used models in studies to predict the occurrence of financial distress. According to Irama (2018), the potential for bankruptcy in the Altman Z-Score affects stock prices. This is further supported by Saraswati et al. (2020) who state that the potential bankruptcy of Altman Z-Score also affects stock prices.

However, Fadrul et al. (2020) argued that the prediction accuracy of the financial distress model X-Score Zmijewski, with a 100% accuracy rate, is higher than that of the Altman Z-Score and Springate models. According to the X-Score Zmijewski model, there were no errors in predicting companies experiencing financial distress. Research by Listyarini (2020) and Viciwati (2020) analyzing the accuracy of financial distress prediction models on companies listed in the Indonesian Stock Exchange also found the Zmijewski model to have a 100% accuracy rate. Lutfiyyah et al. (2021) found that Zmijewski's model had the highest accuracy rate in predicting financial distress in their analysis of soccer clubs. This is consistent with Gerritsen's (2015) previous research. There are three variables utilized as references for the computation in Zmijewski's model, including Return on Asset (ROA), Debt Ratio based on Total Liability to Total Assets, and Current Ratio based on Current Assets to Current Liability.

According to Wawo et al. (2020), using the Zmijewski model, companies experiencing financial distress are likely to experience stock price declines. Therefore, analysis is crucial in predicting the likelihood of a company experiencing bankruptcy. This is consistent with the findings of Darmayanti et al. (2020) and Gantino et al. (2020).

Based on the information provided and considering the significant role of the potential bankruptcy influence that can be measured by the Zmijewski Method on stock prices as an effort to prevent investors from experiencing losses due to choosing the wrong company stock, the author intent a study entitled "The Effect of Bankruptcy Potential on Stock Prices of Manufacturing Companies Listed on The Indonesian Stock Exchange during the period of 2017 - 2021".

Signaling Theory

Signal theory was first introduced by Spence (1973), who stated that the sender (information owner) would provide a signal in the form of information that reflects the company's condition for the receiver's benefit. Afterwards, Ross developed the signal theory in 1977. According to Ross (1977), executives with superior information about their company are incentivized to disclose it to potential investors to increase the company's stock price.

As explained by Brigham et al. (2011), the signal theory outlines the management's perception of the company's future growth, which will impact potential investor response. Jogiyanto (2015) defines signal theory as information released by a company in the form of announcements to provide signals for investors in making investment decisions. Based on the definition above, it can be concluded that signal theory discusses how signals (information) concerning the success and failure of management should be conveyed to company owners. One type of information that companies generate which can act as a signal to external parties is the annual financial report.

Signal theory can also be applied to discuss the fluctuations of stock prices in the stock market, thus affecting investment decision-making. The responses of investors to positive and negative signals will impact market conditions. Investors may react in various ways, such as observing and waiting for developments before making decisions.

Stock

According to the Securities Market Law No. 8 of 1995, a stock is a security that represents an individual's/institution's ownership in a company (commonly held by individuals/institutions in a company). When someone buys a company's stock, they become a shareholder or owner of that company.

Tandelilin (2017) defines a stock as proof of ownership of a company's assets that issues stocks. By owning shares of a company, investors gain rights to the income and assets of the company, after all of its liabilities have been paid. According to Fahmi (2016), shares are evidence of ownership participation in the capital/funds of a company. From the definitions mentioned above, it can be concluded that stocks are tradable securities of a company and stockholders have a role and interest in the issuing company.

Stock Prices

According to the Securities Market Law No. 8 of 1995, the price of shares essentially represents the significant sacrifice that every investor must make to participate in a company. Brigham, et al. (2011) define the stock price as "the value of shares that determines the wealth of stockholders. Maximizing the wealth of stockholders is translated into maximizing the stock price of the company." The price of stocks at any given time will depend on the expected future cash flow that the average investor will receive if they purchase stocks. Each stock, of course, has a different price. The stock price is the value of a stock listed on an exchange that can rise or fall rapidly, depending on transactions involving buyers and sellers of the stock (Jogiyanto, 2015).

According to Widoatmodjo (2012), there are two types of stock prices:

a. Nominal Price - the price stated in the stock certificate determined by the issuer to evaluate each share issued. The size of the nominal price gives significant meaning to the shares as the minimum dividend is usually set based on the nominal value.
b. IPO Price. The price represents the moment when the stock price is recorded in the stock exchange. Typically, the stock price in the primary market is established by the underwriter and the issuer. Therefore, it will be known how much the issuer's stock will be sold to the public, usually to determine the initial price.
c. Market price. The market price denotes the selling price between investors following a stock's exchange listing. In the secondary market, negotiations between investors and the issuing company resulting in a different price hardly ever occur. The market price is the daily price announced in newspapers or other media outlets.
d. The Opening Price. The opening price is the price requested by the seller or buyer when the stock market opens. It is possible that a transaction has already taken place for a particular stock at the beginning of the trading day, and the price matches what the seller and buyer requested. In such cases, the opening price may become the market price, and vice versa, the market price may become the opening price. However, this is not always the case.
e. The closing price is the price requested by the seller or buyer at the end of the trading day. In such circumstances, it is possible that a transaction may occur for a particular stock at the end of the trading day due to an agreement between the seller and the buyer. If this happens, the closing price becomes the market price. However regardless of this, the closing price remains the same for that day of trading.
f. The highest price of a stock is the highest price at which it is traded during a trading day. This price may occur multiple times for a single stock transaction at different prices.
g. The lowest price of a stock, on the other hand, is the lowest price at which it is traded during a trading day. This price can occur when a stock is traded more than once not at the same price. In other words, the lowest price is the opposite of the highest price.

Potential Bankruptcy

According to Altman (1968), a potentially bankrupt firm is one that is legally bankrupt. Whereas bankruptcy under the 1998 Law is where an institution is declared by a court decision if the debtor has two or more creditors and fails to pay at least one overdue debt that can be collected. According to Prihadi (2019), bankruptcy is a situation when a company faces financial difficulties and is no longer able to fulfil its obligations.

Darsono et al. (2006) describe that the causes of bankruptcy can broadly be divided into two categories: internal factors and external factors. Internal factors refer to those originating from the company's management. External factors can originate from outside factors that are directly related to the company's operations or factors.

Zmijewski Model

Zmijewski model conducted an extended study on bankruptcy prediction in 1984 by adding financial ratio validity as a method for detecting corporate financial failure. Zmijewski (1984) reviewed bankruptcy research studies from the previous 20 years and utilized liquidity and leverage ratio analysis to measure a company's performance. Zmijewski predicted from 1972 to 1978 with a sample of 75 bankrupt companies and 3,573 healthy ones. The F-Test indicator was used to compare the rate of return, liquidity, leverage turnover, fixed payment coverage, trend, firm size, and stock return volatility between healthy and unhealthy companies. The results showed significant differences between healthy and unhealthy companies. The Zmijewski X-Score model measurement is as follows (Zmijewski, 1984):

$$Z = -4.3 - 4.5ROA + 5.7DAR + 0.004CR$$

After obtaining the results from calculating Zmijewski X-Score equation, it will be adjusted based on the evaluation criteria or cut-off point as follows:

a) X < 0 (Safe Zone) indicates that the company is in a secure zone and is not at risk of financial difficulties or bankruptcy.
b) X> 0 (Distress Zone) indicates that the company is currently experiencing financial problems and is at risk of bankruptcy.

Company Size

A larger company size can improve a company's reputation, thereby attracting investors to invest in it and increasing the company's stock price. In this study, company size is a control variable represented by the symbol 'size', and measured by total assets. Specifically, we measure size = *Ln total asset*

Covid-19 Period

The study also incorporates control variables, including the period before the Covid-19 pandemic (2017-2019) and the Covid-19 pandemic period (2020-2021). These control variables are measured using dummy variables with a score of 0 for the pre-Covid-19 period and 1 for the pandemic period.

Based on these research theories, a framework for this research can be created, namely as follows.

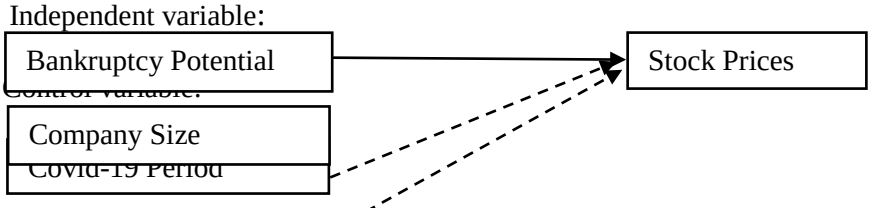

Figure 1. Research Framework

Based on the framework, the authors make hypotheses regarding this study. The following is the hypothesis in this study.

H1. Bankruptcy potential has a negative effect on stock prices

METHOD, DATA, AND ANALYSIS

This study employs a quantitative approach with numerical data to test hypotheses using specific populations and samples (Sugiyono, 2017). The independent variable utilized in this study is the potential for bankruptcy, measured through the Zmijewski model (X-Score). The dependent variable is the closing stock price, while the control variables consist of the company size, measured as the natural logarithm of the total assets, and a dummy variable indicating the Covid-19 period.
The population under investigation comprises all registered manufacturing companies on Indonesia Stock Exchange between 2017 to 2021. Sampling was conducted through purposive sampling. By implementing such a sampling technique, researchers can select samples that align with the desired criteria (Sekaran et al., 2016).

Table 1. Criteria for Selecting Research Samples

No.	Criteria	Sum
1.	Manufacturing companies listed on the Indonesia Stock Exchange (IDX) from 2017 to 2021.	214
2.	The manufacturing company that did not go public during the observation period.	140
3.	The manufacturing company that published comprehensive financial reports presented from 2017-2021 in Rupiah currency.	104
Total number of research samples		104
Observation Data (5 years)		520

Source: Personal Processed Data (2023)

At the data analysis stage, this study implements classic assumption testing and hypothesis testing through panel data regression analysis. The classic assumption test examines multicollinearity and heteroscedasticity phenomena in the study's variables. Before entering the hypothesis test, regression model testing is conducted using the Chow, Hausman, and Lagrange Multiplier tests to determine the best model to use. Finally, in the last stage, a panel data regression analysis was conducted to test the hypotheses using Eviews 12 software. The hypothesis testing included a t-test to examine the partial effects of the independent variables and a coefficient of determination (R^2) test to determine the ability of the independent variables to explain the dependent variable.

RESULT AND CONCLUSSION

Regression Model Selection

Table 2. Chow Test Results

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	6.023433	(103,413)	0.0000
Cross-section Chi-square	476.931079	103	0.0000

Source: Personal Processed Data (2023)

According to the Chow Test displayed above, the Chi-Square Statistic value with a probability of 0.000 (less than 5%) was obtained. Therefore, the appropriate model to use for panel data regression is the Fixed Effect Model based on statistical analysis.

Table 3. Hausman Test Results

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	3	1.0000

* Cross-section test variance is invalid. Hausman statistic set to zero.

Source: Personal Processed Data (2023)

Based on the Hausman test shown in the table below, the cross-section random probability value is 0.2866 > 0.05, indicating that the Random Effect Model (REM) is a more suitable model to be used.

Table 4. Lagrange Multiplier Test Results

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	259.7217	0.178125	259.8999
	(0.0000)	(0.6730)	(0.0000)

Source: Personal Processed Data (2023)

Based on the LM test results above, the Breusch-Pagan Both value is 0.0000 < 0.05, indicating that the Random Effect Model (REM) is more suitable to be used.

Multicollinearity Test

Table 5. Multicollinearity Test Results

	X1	K1	K2
X1	1	-0.0128	-0.1219
K1	-0.0128	1	0.0228
K2	-0.1219	0.0228	1

Variable Description
X1 = Bankruptcy Potential
K1 = Company Size (control variable)
K2 = Covid-19 Period (control variable)

Source: Personal Processed Data (2023)

Based on the results in Table 5, none of the correlations between independent variables have a value greater than 0.8. This means that there is no multicollinearity in this regression model, or in other words, there is no correlation between the independent variables in this model.

Heteroscedasticity Test

Table 6. Heteroscedasticity Test Results

	Coefficient	Std. error	t-Statistic	Prob.
C	-21.1153	72.9569	-0.2855	0.7754
X1	1.5285	7.2862	0.2097	0.8339
K1	2.3255	2.5910	0.8975	0.3698
K2	3.9053	5.0951	0.7664	0.4437

The variable descriptions follow those listed in Table 5.

Source: Personal Processed Data (2023)

Based on Table 6 above, which indicates that the independent variable's probability value is >0.05, the results show that the data is free from heteroscedasticity.

Panel Data Regression

Based on the Chow Test and the Hausman Test, a random effects model (REM) is more suitable for this study. The following table displays the results of the analysis of the panel data regression using the Random Effect Model (REM) to analyze the t-test, F-test, and the Coefficient of Determination (R^2).

Table 7. Panel Data Regression Equation Test Results

Variable	Coefficient	t-Statistic	Prob.	Conclusion
C	1355.942	4.0563	0.0001	
X1	-58.6687	-2.4574	0.0143	Significant
K1	-39.3648	-3.3603	0.0008	Significant
K2	-23.7405	-1.4889	0.1371	Insignificant
Adjusted R-square	= 0.03			
F-Statistic	= 6.361			
Prob (F-Statistic)	= 0.0003			
The variable descriptions follow those listed in Table 5				

Source: Personal Processed Data (2023)

Based on the results depicted in Table 7, the coefficient of determination test (R^2), as indicated by the adjusted R-Square value, was 0.03 or 3%. Therefore, it can be concluded that the variables of bankruptcy potential, company size, and Covid-19 period in this study cannot explain the stock price variable due to its value approaching 0. The partial significance test (t-test) indicates a probability value. X1 is equal to 0.0143 (less than 0.05) with a coefficient of -58.6687 (negative), indicating that the potential for bankruptcy has a partial negative effect on stock prices. Therefore, H1 is accepted.
Similarly, with control variable K1, the probability value is 0.0008 (less than 0.05) and the coefficient is -39.3648 (negative), meaning that the control variable, size of the company, has a partial negative effect on stock prices. As for variable K2, it displays a probability value of 0.1371 (> 0.05) with a coefficient of -23.7405, indicating that the partial effect of the Covid-19 period control variable does not have an impact on stock prices. Moreover, based on the results of the simultaneous significance test, a probability value (F-statistic) of 0.0003 was obtained, which is smaller than 0.05, it can be concluded that the three variables, namely bankruptcy potential, company size and covid-19 period simultaneously have a significant effect on stock prices in manufacturing companies listed on the IDX for the period 2017 - 2021.

Impact of Bankruptcy Potential on Stock Prices (H1)

Based on the first hypothesis, it is suggested that bankruptcy potential has a negative effect on stock prices. The research results indicate a significant value of bankruptcy potential at 0.0143, which is smaller than 0.05. Therefore, it can be concluded that the partial effect of bankruptcy potential (X1) influences the stock prices variable (Y). A negative sign on the regression coefficient indicates a negative relationship, meaning that if the predicted potential bankruptcy value is positive, then the company's stock price will decrease. This suggests that if a company is facing potential bankruptcy, there is a tendency for its stock price to decline.

Information is a fundamental need for investors in making decisions. The use of financial information through financial statements by external parties is utilized to make investment decisions in determining the resources to be invested. The disclosure of financial distress, which may lead to company bankruptcy, is likely to result in negative sentiment, whereas information related to improved performance is likely to result in positive sentiment. This is in line with signaling theory, which suggests that negative signals will lead to a decrease in stock prices, as affirmed by the findings of Wawo et al. (2020), Darmayanti et al. (2020), and Gantino et al. (2020). The potential for bankruptcy indicates poor financial conditions, which is negative information for the market, leading to a decrease in stock prices. Research indicates that the potential for bankruptcy has a negative impact on stock prices.

CONCLUSIONS

Based on the results of the hypothesis test, it can be concluded that the potential for bankruptcy has a negative impact on stock prices with company size and the COVID-19 period as control variables. This conclusion provides an understanding of the factors that influence stock prices in manufacturing companies, which is important for investors to make decisions.
This study has limitations, so future researchers are encouraged to make some improvements. Suggestions for future researchers include expanding the variables to be analyzed by considering macroeconomic factors that may affect stock prices. Since this study focuses on manufacturing companies, future research may consider a broader range of industries. By involving companies from different industries, researchers can identify factors that may be more specific to a particular industry and understand their influence on stock prices.

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