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Navigating Financial Distress: Altman Z-Score Predictive Power on Stock Performance

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ABSTRACT

The study aims to analyze the effect of the financial ratio component in the Altman Z-Score model on the stock price. The data used is the financial report data of the agro- and marine-industry companies listed on the Indonesian Stock Exchange from 2018 until 2020. The data is analyzed using panel data analysis methods. The calculation of the Z-Score value shows how many companies in the agro- and marine sectors are potentially bankrupt. Research results show that the RE/TA ratio has a positive and significant effect on the stock price, while the WC/TA, EBIT/TA, and MVE/BVL ratios have a negative effect on the stock price. The results of this research will imply that financial managers, auditors, lenders, and investors can make the Z-Score model a valuable instrumental indicator in making the right decisions in the face of financial distress.

Keywords : *Financial distress; Stock Price; Financial Ratio; Altman Z-Score*

ABSTRAK

Penelitian ini bertujuan menganalisis pengaruh dari komponen rasio keuangan dalam model Altman Z-Score terhadap harga saham. Data yang digunakan merupakan data laporan keuangan perusahaan industri Agro and Marine yang terdaftar di Bursa Efek Indonesia tahun 2018 sampai dengan 2020. Data dianalisis dengan menggunakan metode analisis data panel. Hasil perhitungan nilai Z-Score menunjukkan baberapa perusahaan sektor agro dan marine berpotensi mengalami kebangkrutan. Hasil penelitian menunjukkan bahwa rasio RE/TA berpengaruh positif dan signifikan harga saham, sedangkan rasio WC/TA, EBIT/TA dan MVE/BVL berpengaruh negatif terhadap harga saham. Hasil penelitian ini akan berimplikasi bagi manajer keuangan, auditor, pemberi pinjaman, investor yang dapat menjadikan model Z-Score sebagai indikator instrumental yang berharga dalam membuat keputusan yang tepat dalam menghadapi *financial distress*.

Kata kunci: Kebangkrutan; Harga saham; Rasio Keuangan; Altman Z-Score.

1. Introduction

Assessing the likelihood of business insolvency is a primary obstacle in contemporary economic and financial studies. The process of globalization makes it more difficult for a business to survive. The global financial crisis that started in 2008 led to a sharp rise in the number of businesses facing bankruptcy threats worldwide. The global financial crisis also demonstrated the necessity for even the finest businesses to regularly assess their financial condition (Korol, 2017).

Scholars and practitioners have focused a lot of attention on the potential funding risk, known as rollover risk, associated with the financial crisis that persisted until 2009. Some businesses are

unable to extend maturing debt because of illiquid credit markets during times of low credit availability. Following the start of the financial crisis, these worries were especially pressing (Altman, Hotchkiss, and Wang, 2019).

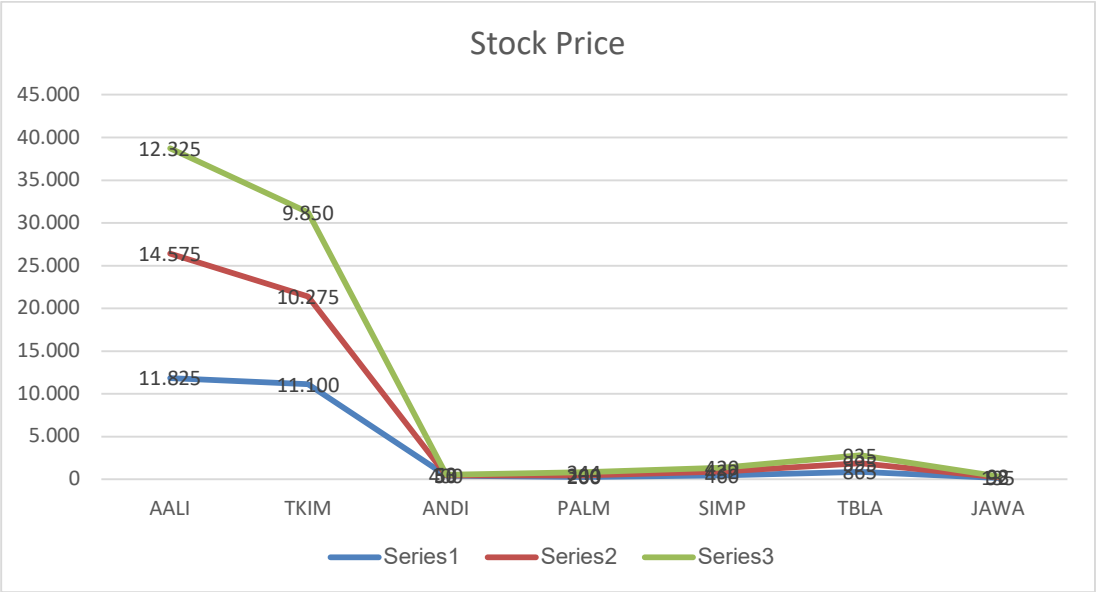

Figure 1. Share Prices of Companies in the Agro and Marine Industry Sector 2018–2020. Source: Data Processed (2023).

As seen in Figure 1, share prices among companies in the Agro and Marine Industry sector fluctuate. The state of the company's finances is one of the many variables that can affect share price changes. Given that financial issues are a sign of an unhealthy company, Altman Z-Score model study is necessary to forecast bankruptcy. Z-Score is a methodology for firm bankruptcy analysis that computes financial ratios. Of the seven financial ratios that were chosen, five are used in this Altman model (Sarumpaet & Sugianto, 2021). For many economists, predicting company insolvency has also been a prominent area of interest. The reason for developing and predicting a company's financial difficulties is to develop a prediction model that is used to predict the financial condition of a company.

The empirical evidence supporting Z-Score's impact on stock prices comes from a number of earlier studies. The findings of (Kadim & Sunardi, 2018) study indicate that while the RE/TA ratio has a negative impact on stock prices, the WC/TA, EBIT/TA, MVE/BVL, and S/TA ratios have positive effects. An additional investigation delves further into the influence of the financial ratios that comprise the Altman Z-Score on stock prices. A study by (Ardian & Khoiruddin, 2014) found that while the financial ratios that make up the Z-Score, such as WC/TA, RE/TA, EBIT/TA, MVE/BVL, and S/TA, concurrently have a positive and significant effect on stock prices, the Z-Score test results do not have a significant impact on stock prices.

According to Sukmawati (2014), EBIT/TA and MVE/BTL have quite a big influence on share prices, while WC/TA, RE/TA, and S/TA (sales to total assets) have little influence on stock prices. Research results (Prasetianto et al., 2021; Priambodo & Kurniasih, 2021) show that Z-Score has an effect on stock prices.

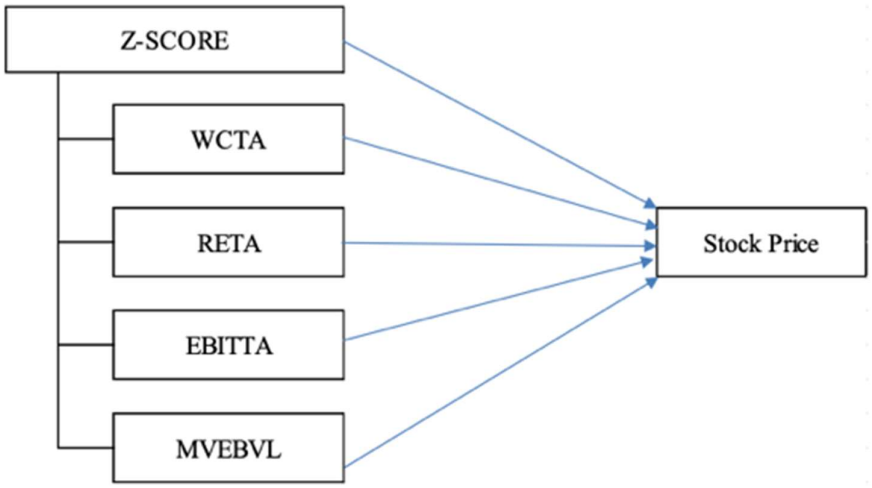

Figure 2. Framework

2. Research Methodology

This study used quantitative methods and was conducted on the Indonesian Stock Exchange. All agro-industrial and marine enterprises registered on the Indonesia Stock Exchange between 2018 and 2020 include the research population. Purposive sampling was used to determine the study sample, and 23 companies were selected to serve as research samples. In this study, 69 observations were made during the course of the three-year observation period. Panel data regression was used for data analysis, while eViews 12 was used for data processing.

Table 1 lists the variables used in this investigation along with their corresponding measures.

Table 1. Operationalization of Research Variables

No	Variable	Measurement	Scale
1	Stock Price (Y)	Harga saham penutupan pada akhir tahun	Ratio
2	WC/TA (X_1)	Working Capital/Total Asset	Ratio
3	RE/TA (X_2)	Retained Earnings/Total Asset	Ratio
4	EBIT/TA (X_3)	Earnings Before Interest and Taxes/Total Asset	Ratio
5	MVE/BVL (X_4)	Market Value of Equity/Book Value of Total Liabilities	Ratio

3. Results and Discussion

Descriptive Statistics

Table 2 displays descriptive data for every variable. According to Table 2, the variable of WC/TA (X_1) has a minimum value of -1,579800, a maximum value of 2,573200, a mean value of 0,087100, and a standard deviation of 0,543470.

The RE/TA's variable (X_2) minimum value of -11,32770, maximum value of 0,734400, mean value of -0,108590, and standard deviation of 1,476034 are all kept in relation to the total asset (RE/TA) of that analysis.

Table 2. Descriptive Statistics of Research Data

Variable	Minimum Value	Maximum Value	Mean	Standard Deviation
X_1	-1,579800	2,573200	0,087100	0,543470
X_2	-11,32770	0,735400	-0,108590	1,476034
X_3	-6,571400	0,494300	-0,087294	0,801050
X_4	0,001000	339,5811	8,834800	41,95542
Y	50	14.575	1.828,159	3.266,960

Source: Data Processed (2023).

The calculation of EBIT/TA (X_3) has a minimum value of -6,571400, a maximum valuation of 0.494300, a mean value of -0,087294, and a deviation standard of 0.802050. For variable MVE/BVL (X_4), the mean average value is -8,834800, the default deviation is 41,95542, the maximum value is 339,5811, and the minimum valuation is 0,001000.

PT. Gozco Plantations Tbk owns the minimum value of IDR 50 for the stock price variable in the years 2018, 2019, and 2020. The highest amount owned in 2019 is IDR 14,575. The survey's average stock value for the agro-marine industry company was 1,828,159, with a standard deviation of 3,266,960.

Table 3 displays the Z-Score calculations for firms in the agriculture and marine industries from 2018 to 2020.

Table 3. Result of Z-Score

No.	Company Code	Year	Z-Score	Prediction
1	AALI	2018	5,74	Safe
		2019	6,03	Safe
		2020	6,43	Safe
2	TKIM	2018	2,92	Safe
		2019	3,28	Safe
		2020	3,05	Safe
3	ANDI	2018	13,27	Safe
		2019	2,91	Safe
		2020	1,93	Grey Area
4	SMAR	2018	2,86	Grey Area
		2019	2,11	Grey Area
		2020	2,64	Grey Area
5	SGRO	2018	2,36	Grey Area
		2019	1,65	Grey Area

		2020	1,07	Bankrupt
6	FISH	2018	2,64	Grey Area
		2019	2,14	Grey Area
		2020	2,40	Grey Area
7	SSMS	2018	5,35	Safe
		2019	2,78	Grey Area
		2020	3,69	Safe
8	LSIP	2018	8,91	Safe
		2019	9,63	Safe
		2020	10,18	Safe
9	PALM	2018	5,59	Safe
		2019	5,94	Safe
		2020	19,06	Safe
10	SIMP	2018	1,24	Safe
		2019	0,83	Bankrupt
		2020	1,29	Grey Area
11	UNSP	2018	-8,80	Bankrupt
		2019	-17,38	Bankrupt
		2020	-17,28	Bankrupt
12	TBLA	2018	2,65	Grey Area
		2019	2,48	Grey Area
		2020	2,32	Grey Area
13	MGRO	2018	10,46	Safe
		2019	5,70	Safe
		2020	20,30	Safe
14	BWPT	2018	-0,07	Safe
		2019	-0,55	Bankrupt
		2020	-1,13	Bankrupt
15	GZCO	2018	-2,75	Bankrupt
		2019	-65,14	Bankrupt
		2020	-2,61	Bankrupt
16	DSFI	2018	-06,00	Bankrupt
		2019	4,22	Safe
		2020	0,98	Bankrupt
17	ANJT	2018	3,01	Safe
		2019	-3,20	Bankrupt
		2020	2,81	Grey Area
18	JAWA	2018	0,60	Bankrupt
		2019	-0,30	Bankrupt
		2020	-2,01	Bankrupt
19	MAGP	2018	-0,37	Bankrupt
		2019	-3,55	Bankrupt
		2020	-3,99	Bankrupt
20	BISI	2018	19,20	Safe
		2019	12,20	Safe
		2020	14,37	Safe
21	IIKP	2018	355,06	Safe

		2019	73,48	Safe
		2020	70,93	Safe
22	BTEK	2018	3,33	Safe
		2019	1,19	Bankrupt
		2020	-0,63	Bankrupt
23	DSNG	2018	1,73	Grey Area
		2019	1,30	Grey Area
		2020	2,10	Grey Area

Source: Processed Data (2023).

Table 4. Company Category

Year	Z-Score Category		
	Safe	Grey Area	Bankrupt
2018	11	6	6
2019	9	6	8
2020	8	7	8
Total	28	19	22

Source: Processed Data (2023).

Panel Data Regression Model Selection

Table 4 displays the pairing test results for the three data panel regression models used to create the regression equation estimating the effect of the ratios of WC/TA, RE/Ta, EBIT/TA, and MVE/BVL on stock price. Table 5 indicates that the Common Effect Model is the best estimate model for the first regression equation, which represents the impact of the ratios of WC/TA, RE/Ta, EBIT/TA, and MVE/BVL on the stock price.

Table 5. Panel Data Regression Model Selction

Testing	Probability/Sig. value	Conclusion
Chow Test	0,0437	Fixed Effect Model
Hausman Test	0,7222	Random Effect Model
Lagragge Multiplier (LM-test)	0,0742	Common Effect Model

Source: Processed Data (2023).

Table 6. Panel Data Regression Test Results - Common Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constanta	1.818,823	400,2408	4,544321	0,0000
X_1	-119,6023	875,2025	-0,136657	0,8917
X_2	2.052,758	909,3611	-10,91636	0,0274
X_3	-3.252,233	1.784,605	-1,822383	0,0731
X_4	-4,667700	9,296001	-0,502119	0,6173

R-*squared*	0,095515		
Adjusted R-*squared*	0,038985	Durbin-Watson Stat	1,324575
F-*statistic*	1,689622		
Prob (F-*statistic*)	0,163303		

Source: Processed Data (2023).

Table 6 allows for the creation of a panel data regression equation to determine how Z-Score affects stock price:

$$Y= 1.818{,}823 - 119{,}6063X_1 + 2.052{,}758\ X_2 - 3{,}252{,}233X_3 - 4{,}667700X_4 + e_{it} \quad (1)$$

It can be determined from the data panel regression equation above that:

1. A constant value of 1,818,823 means that the prediction of the stock price (Y) at the time of the fourth free variable is considered constant or of zero value, which affects the change in the average value of the share price.
2. The regression coefficient value for the variable WC/TA ($X_{1)}$ is -119,6063 and is negative. This means that there is an opposite relationship between the X1 variable (WC / TA) and the stock price, i.e. each increase in the WC/TA ratio will lower the share price by 119,6063 times.
3. The regression coefficient value for the variable RE/TA (X_2) is 2.052, 758 and is positive. This means that there is a correlation between the X2 variable (RE / TA) and the stock price, i.e. every increase in the RET/TA ratio, then it will increase the price of the stock by 2.052.758 times.
4. The regression coefficient value for the variable EBIT/TA (X_3) is -3.252.23 and is negative. This means that there is an opposite relationship between the EBIT/TA ratio, and the stock price, i.e. every increase in the EBIT/TA ratio will lower the share price by 3.252.23.
5. The regression coefficient value for the variable MVE/BVL (X_4) is -4.252,233 and is negative. This means that there is an opposite relationship between the variable MVE/BVL ratio and the price of the stock, i.e. every increase in the MVE/BVL ratio variable will lower the share price by 4.252.233 times.

Hypothesis Test Results

F-Test Result

The F test is a test that is useful for determining whether the independent variable of the dependent variable will affect simultaneously or together or not.

Table 7. F-Test Result Based on Common Effect Model

F-Statistic	1,689622
Prob (F-statistic)	0,163303

Source: Processed Data (2023).

The F value of the table can be seen in the statistical f table where df 1= 4 and df2 = n-k-1 or 69-4-1 = 64 with a significance of 0.05, then obtained the f value of the table

of 2.515 From these data, the statistical F value is greater than the F of the table 1,689 < 2,515.

As a result, H_0 is accepted and H_a is rejected, leading to the conclusion that the share price is unaffected by the ratios of WC/TA, RE/Ta, EBIT/TA, and MVE/BVL combined.

Partial Test (t-Test) Result

The results of a partial hypothesis test can be seen in Table 6. The table interpretation above is as follows:

1. The stock price is negatively affected by the WC/TA ratio, although not significantly.
2. The stock price is positively and significantly affected by the RE/TA ratio.
3. The stock price is negatively affected by the EBIT/TA ratio, although not significantly.
4. The stock price is negatively affected by the MVE/BVL ratio, although not significantly.

Discussion

Effect of WC/TA Ratio on Stock Price

The hypothesis test results demonstrated that the stock price had been negatively affected by the WC/TA ratio. Investors believed that a higher WC/TA ratio indicated improper working capital utilization by the company, which in turn decreased stock demand (Sarumpaet & Sugianto, 2021). Retained profits and other variables piqued the interest of investors more. Investors are more interested in other variables, such as profit and profit retained. These results differ from studies (Sarumpaet & Sugianto, 2021) and (Sareen & Sharma, 2022), where the WC/TA ratio has no effect on the stock price.

Effect of RE/TA Ratio on Stock Price

Among various Z-score ratios, the results of the hypothesis test indicated that RE/TA was one of the statistically significant affecting factors in forecasting the stock price. In order to grow its capacity through profit-generating activities, the company uses its retained profits to refinance such activities in accordance with its dividend policy (Sarumpaet & Sugianto, 2021). Its likelihood of going bankrupt decreases with an increase in the ratio of retained profits to total assets (Surwanti et al., 2022).

The results of this study are in line with the results of the study (Sarumpaet & Sugianto, 2021) which shows that there is an influence between RE/TA and the stock price.

Effect of EBIT/TA Ratio on Stock Price

The results of the test of the EBIT/TA ratio hypothesis showed a negative effect on the stock price. This study was not consistent with the findings of the research (Sarumpaet & Sugianto, 2021), (Sareen & Sharma, 2022) and (Utami et al., 2023), where the results showed that EBIT/TA had a significant effect on stock prices.

Effect of MVE/BVL ratio on Stock Price

The results of the hypothesis test showed that the MVE/BVL ratio had a negative effect on the stock price. The market value of a company tends to fluctuate every year, whereas the value of its debt books tends to be constant. The fluctuations in equity market value can be caused by the fluctuations in the company's stock market price (Surwanti et al., 2022).

The results of this study are inconsistent with the results of the studies (Sarumpaet & Sugianto, 2021), (Sareen & Sharma, 2022) and (Utami et al., 2023), where the results show that MVE/BVL has a significant effect on stock prices and there is a direct relationship between market value and stock price.

4. Conclusion and Suggestion

In the agricultural and marine sectors, the WC/TA, EBIT/TA, and MVE/BVL ratios have all had a negative impact on stock prices between 2018 and 2020; on the other hand,

the RE/TA ratio significantly influences stock variations in a positive way.
Further research suggested could develop bankruptcy predictive analysis using other methods such as the OSLO, Springate and Zmijewski models.

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