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Analysis of The Effect of Bankruptcy Predictions with Models Altman, Springate, Ohlson, Foster, Zmijewski, and Grover on The Return of Shares in Entertainment and Film Companies Listed on The Indonesia Stock Exchange in 2018-2021

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Abstract. A company will not be free from the risk of bankruptcy, especially when where the conditions of entertainment and movies are consumed at home, while producers' activities are disrupted because they usually produce in the field. This study aims to determine the effect of financial statements on bankruptcy prediction analysis, including financial ratios to stock returns in entertainment and film companies listed on the Indonesia Stock Exchange. This research uses a descriptive quantitative method with panel data and secondary data obtained on the Indonesia Stock Exchange from 2018 to 2021. Data analysis using the E-Views program. The results of the bankruptcy prediction from this study using the Altman, Springate, Ohlson, Foster, Zmijewski, and Grover models has no significant effect on stock returns, but this bankruptcy prediction must always be done periodically to avoid actual bankruptcy conditions and as an effort to save the company's performance, especially financial performance.
Keywords: Altman; Springate; Ohlson; Foster; Stock Return.

I. Introduction

A company will not be free from the risk of bankruptcy, especially when conditions are at home where entertainment and movies are consumed at home, while producers' activities are disrupted because they usually produce in the field, not to mention that many of the industry's competitors come from abroad who have previously take advantage of online networks that can be easily accessed from home with interesting content, in addition to the weakening of the economy causing income to decline, this is felt by MNC Picture and MD Entertainment, which are companies in the entertainment and film industry listed on the Indonesia Stock Exchange.

To find out the prediction of the company's bankruptcy, the Altman, Springate, Ohlson, Foster, Zmijewski, and Grover models are used so that companies and investors can find out the current conditions of various bankruptcy prediction models, besides that this study will also examine the effect of bankruptcy predictions from the model is on stock returns, because since this company was published, they have been suspended by the regulator.

II. Literature Review

Financial Statement

According to Titman et al. (2018), financial statements are divided into several types based on the presentation process.

1. The income statement is a record that shows the income generated through the company, the prices used to create the revenue, and the income earned over a certain period.
2. The balance sheet is a record containing information about the company's assets, liabilities, and capital.
3. A cash flow statement is a record that shows the company's cash inflows and outflows over a certain period.

Financial Distress

When a company faces liquidity problems, the company will likely experience financial difficulties, and if this is not resolved immediately, it can result in bankruptcy. Avoiding bankruptcy requires various policies, strategies, and external and internal stakeholders (Fahmi, 2018). Financial distress is a condition where the company cannot fulfill its obligations. Financial distress has two meanings. Financial distress is a very cruel natural selection that makes the company eliminated from the market if the company cannot control the situation so that the company will be in a state of default and bankruptcy. Then secondly, financial distress is a condition that can be profitable if the company manages it well, and then the situation becomes a reminder to deal with problems that arise (Kristianti, 2019).

Bankruptcy

Bankruptcy is one thing that all companies should avoid. Knowing the potential for bankruptcy is one of the objectives of balance sheet analysis. Companies that know the potential for bankruptcy can make long-term plans to prevent this situation (Wulandari et al., 2016). This bankruptcy begins with the occurrence of a default which is the culmination of financial distress where the company in this condition is unable to pay debts or interest to creditors when they fall due. With this, the company will find it difficult to get external funding.

Altman Model

The Altman Z-Score was proposed in 1968 by Dr. Edward I. Altman, professor of financial economics at NYU's Stern School of Business. Altman uses five financial indicators: working capital to assets, retained earnings to total assets, earnings before interest and taxes to total assets, book value of shares to book value of liabilities, and total sales assets using Multivariate Discriminant Analysis (MDA). Later, this model was redesigned by Altman. This new model makes it possible to predict the bankruptcy of private sector companies and manufacturing companies that have gone public (Wulandari et al., 2016).

Springate Model

The Springate model is a bankruptcy prediction model based on the research of G.I.V. Springate 1978, known as the Springate model or the Canadian model. This research was conducted in a process modeled by Altman. This process uses stepwise multiple discriminant analysis to select 4 of 19 financial ratios to correctly see the difference between healthy and insolvent companies (default) (Adji & Abdul, 2019).

Ohlson Model

Ohlson Score was discovered by James Ohlson in 1980. When he found this model, Ohlson questioned the Multiple Discrimination Analysis (MDA) model found by Altman (1968). For comparison, Ohlson uses logistic regression in his calculation formula. Ohlson's model provides three formulas for predicting bankruptcy, namely one year before bankruptcy, two years before the bankruptcy, and predictions in one and two years before bankruptcy (Wulandari et al., 2016).

Foster Model

Foster was created by George Foster through research conducted to predict the bankruptcy of US railroad companies from 1970 to 1971 (Nasri et al., 2018). In predicting bankruptcy, Foster uses a univariate model with two ratios where the first ratio shows the amount of operating expenses related to income, and the second ratio shows the amount of operating profit compared to the interest paid.

Zmijewski Model

Zmijewski has a sample consisting of 840 companies, 40 companies experiencing financial difficulties and 800 companies not experiencing financial difficulties. Data were collected from 1972 to 1978. The statistical model used by Zmijewski is the same as Ohlson's statistical model, namely logit regression (Adji & Abdul, 2019).

Grover Model

Grover was created by Jeffrey S. Grover by designing and reassessing the Altman Z-Score model. Grover argued that a company with a score of 0.02 indicates that the company is bankrupt, then with a score of 0.01 the company is not bankrupt and if the company is between these two limits, the company is in the gray area (Effendi, 2018).

III. Research Method

This research method uses quantitative methods. The purpose of this research is to use descriptive research. This research uses a descriptive quantitative method with panel data and secondary data obtained on the Indonesia Stock Exchange from 2018 to 2021. Financial reports will be retrieved through the official website of the Indonesia Stock Exchange (www.idx.co.id), Yahoo Finance (finance.yahoo.com), and Google Finance (google.com/finance) from 2018 to 2021 for each company. There are 2 companies that will be used as samples in this study, namely, MD Pictures and MNC Studios International. In this study, there are dependent variables and independent variables. The dependent variables in this study are Altman (X1), Springate (X2), Ohlson (X3), Foster (X4), Zmijewski (X5), and Grover (X6) models, and then the independent variable is a stock return (Y). Data analysis using the E-Views program.

IV. Results and Discussion

Results

Prediction Bankruptcy

Prediction Altman Model Bankruptcy

Based on results from Altman Z-Score calculation shows that there are 22 calculations company no bankrupt in the period time certain or on the whole period (1st quarter of 2018 - 3rd quarter of 2021) and in predictable companies are in the gray area there are 8 calculations company in period time certain.

Prediction Springate Model Bankruptcy

Based on results from calculation prediction Springate Model bankruptcy show that There are 12 calculations which company the enter in category companies that have potency in experience bankruptcy in the period time certain or on the whole period (1st quarter of 2018 - 3rd quarter of 2021). Then, 18 calculations other company enter in category no bankrupt in the period time certain or on the whole period (1st quarter of 2018 – 3rd quarter of 2021).

Prediction Ohlson Model Bankruptcy

Based on results from calculation prediction The Ohlson Model bankruptcy shows that there are 28 calculations company no bankrupt in the period time certain or on the whole period (1st quarter of 2018 - 3rd quarter of 2021) and there are predictable company is at bankrupt there are 2 calculations company in period time certain.

Prediction Foster Model Bankruptcy

Based on results from calculation prediction Foster Model bankruptcy shows that there are 26 calculations no bankrupt in the period certain or on the whole period (1st quarter of 2018 – 3rd quarter of 2021) and in predictable companies bankrupt there are 4 calculations company in period time certain.

Prediction Zmijewski Model Bankruptcy

Based on results from calculation prediction Zmijewski model bankruptcy, it shows that there are 30 values calculation enter in category companies that have potency in experience overall bankruptcy period (1st quarter of 2018 – 3rd quarter of 2021). Because the value of $X < 0$, then company in condition bankrupt.

Prediction Grover's Model Bankruptcy

Based on results from calculation prediction Grover Model bankruptcy shows there are 30 values calculation enter in category companies that have potency no bankrupt overall period (1st quarter of 2018 – 3rd quarter of 2021). Since the value of $G > 0.01$, then company in condition no bankrupt.

Research Results Stock *Return*

Stock return movement show that company entertainment and movies experience fluctuation where that movement of stock returns in the period 1st quarter of 2018 – 3rd quarter of 2021. Stock returns highest owned by MNC Studios International in the period 3rd quarter of 2021 amounted to 0.54 and stock returns Lowest owned by MNC Studios International in the period 3rd quarter of 2018. Calculation results from stock return movement this seen existence fluctuation increase or drop stock return value from period 3rd quarter 2018 to 3rd quarter of 2021.

Assumption Test Classic

On the results of the assumption test classic there is four testing, the first could be seen in the normality test carried out using the Jarque-Bera test could concluded that all residual data used in data processing on six variable X to variable Y is normally distributed. Second, the results of the autocorrelation test using the Breusch-Godfrey Serial Correlation LM Test can also be concluded that all data used in data processing on six variable X to Y variable is not occur problem with autocorrelation. Third, the results of the Multicollinearity test concluded that correlation between variable X is not occur multicollinearity problem. Finally, Heteroscedasticity is carried out using the Glejser test could concluded that all data used in data processing on six variable X to Y variable is not occur problems with heteroscedasticity.

Panel Data Regression Test

This t-test will do to know connection six prediction models bankruptcy to *return* stock. This t-test can also use for verifying truth or hypothesis (H0). On retrieval the decision is based on statistical test value obtained from data with provision testing hypothesis as following.

1. If significant value > 0.05, then H0 is accepted which means with method Partial variable dependent no influence variable independent by significant.
2. If significant value > 0.05, then Ha is rejected which means with method Partial variable dependent no influence variable independent by significant.

Following this is hypothesis t-test regarding influence prediction bankruptcy to stock return.

Influence Prediction The Altman (X1) Model Bankruptcy on stock return (Y)

Based on the tests that have been done, the model used in this panel data regression is *common effects models* to know the effect of Altman Model on stock returns. Following this is results testing panel data regression for t-test.

Table 1. t-test Altman Model

Dependent Variable: RETURNSAHAM
Method: Panel Least Squares
Date: 03/24/22 Time: 15:51
Sample (adjusted): 3/01/2018 9/01/2021
Periods included: 15
Cross-sections included: 2
Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.059516	0.046043	1.292606	0.2067
Altman	-0.000295	0.002013	-0.146483	0.8846

Source: E-Views Output

Based on Table 1, the results of the Altman Model panel data regression t-test that has done show that the significant value of Altman Model is 0.8846 where significant value > 0.05. Based on a provision in testing hypothesis, if significant value > 0.05, then H0 is accepted and can be concluded that significant Altman model not influential to stock return.

Influence Prediction Springate Model Bankruptcy (X2) on stock return (Y)

Based on the tests that have been done, the model used in this panel data regression is *common effects models* to know the influence of the Springate Model on stock returns. Following this is results testing panel data regression for t-test.

Table 2. t-test Springate Model

Dependent Variable: RETURNSAHAM
Method: Panel Least Squares
Date: 03/24/22 Time: 17:08
Sample (adjusted): 3/01/2018 9/01/2021
Periods included: 15
Cross-sections included: 2
Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.075628	0.038526	1.963047	0.0596
Springate	-0.023051	0.024369	-0.945929	0.3523

Source: E-Views Output

Based on table 2, the results of the panel data regression t test that has been done show that the significant value of Springate Model is 0.3523 where significant value > 0.05. Based on provision in testing hypothesis, if significant value > 0.05, then H0 is accepted and can be concluded that significant Springate Model no influential to stock return.

Influence Prediction the Ohlson Model Bankruptcy (X3) on stock return (Y)

Based on the tests that have been done, the model used in this panel data regression is *common effects models* to know the influence of the Ohlson Model on stock returns. Following this is results testing panel data regression for t-test.

Table 3. t-test Ohlson Model

Dependent Variable: RETURNSAHAM
Method: Panel Least Squares
Date: 03/24/22 Time: 17:12
Sample (adjusted): 3/01/2018 9/01/2021
Periods included: 15
Cross-sections included: 2
Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.088281	0.064383	1.371189	0.1812
Ohlson	0.006042	0.010062	0.600523	0.5530

Source: E-Views Output

Based on Table 3, the results of the panel data regression t-test that has been done this show that the significant value of Ohlson Model is 0.5530 where significant value > 0.05. Based on provision in testing hypothesis, if significant value > 0.05 then H0 is accepted, and it can be concluded that significant Ohlson model is not influential to stock return.

Influence Prediction Foster 's Model Bankruptcy (X4) on stock returns (Y)

Based on the tests that have been done, the model used in this panel data regression is *common effects models* to know the influence of the Foster Model on stock returns. Following this is results testing panel data regression for t-test.

Table 4. t-test Foster Model

Dependent Variable: RETURNSAHAM
Method: Panel Least Squares
Date: 03/24/22 Time: 17:16
Sample (adjusted): 3/01/2018 9/01/2021
Periods included: 15
Cross-sections included: 2
Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.060393	0.034114	1.770312	0.0876
Foster	-4.17E-06	8.83E-06	-0.472365	0.6403

Source: E-Views Output

Based on Table 4, the results of the panel data regression t-test that has been done show that the significant value of Foster Model is 0.6403 where significant value > 0.05. Based on a provision in the testing hypothesis, if significant value > 0.05, then H0 is accepted, and it can be concluded that significant Foster Model is not influential to stock return.

Influence Prediction Bankruptcy of the Zmijewski Model (X5) on stock return (Y)

Based on the tests that have been done, the model used in this panel data regression is *common effects models* to know the influence of the Zmijewski Model on stock returns. Following this is results testing panel data regression for t-test.

Table 5. t-test Zmijewski Model

Dependent Variable: RETURNSAHAM
Method: Panel Least Squares
Date: 03/24/22 Time: 17:35
Sample (adjusted): 3/01/2018 9/01/2021
Periods included: 15
Cross-sections included: 2
Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009410	0.145263	0.064780	0.9488
Zmijewski	-0.013013	0.040747	-0.319373	0.7518

Source: E-Views Output

Based on Table 5, the results of the panel data regression t-test that has been done show that values significant of Zmijewski model is 0.7518 where significant value > 0.05. Based on a provision in testing

hypothesis, if significant value > 0.05 then H0 is accepted and can be concluded that significant Zmijewski model no influential to stock return.

Influence Prediction Grover Model Bankruptcy (X6) on stock return (Y)

Based on the tests that have been done, the model used in this panel data regression is *common effects models* to know the influence of Grover Model on stock returns. Following this is results testing panel data regression for t-test.

Table 6. t-test Grover Model

Dependent Variable: RETURNSAHAM
Method: Panel Least Squares
Date: 03/24/22 Time: 17:39
Sample (adjusted): 3/01/2018 9/01/2021
Periods included: 15
Cross-sections included: 2
Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.089793	0.067512	1.330040	0.1942
Grover	-0.050756	0.086038	-0.589928	0.5600

Source: E-Views Output

Based on Table 6, the results of the panel data regression t-test that has been done show that the significant value of Grover Model is 0.5600 where significant value > 0.05. Based on a provision in testing hypothesis, if significant value > 0.05 then H0 is accepted and can be concluded that significant Grover model is not influential to stock return.

Discussion

Based on the results of calculations that Altman Z-Score, there are 22 calculations of companies that are not bankrupt in a specific period or the entire period (1st quarter of 2018 – 3rd quarter of 2021) and in companies that are eight predicted to be in the grey area for a specific period. The Springate Model bankruptcy prediction calculation results show that there are 12 calculations in which the company is included in the category of companies that have the potential to experience bankruptcy in a certain period or the entire period (1st quarter of 2018 - 3rd quarter of 2021). Then, in 18 other calculations, the company is included in the category of not going bankrupt during a certain time or the whole period (1st quarter of 2018 – 3rd quarter of 2021).

The results of the Ohlson Model bankruptcy prediction calculation show that there are 28 calculations of companies that are not bankrupt in a specific period or the entire period (quarter 1 of 2018 - quarter 3 of 2021) and in companies that are predicted to be bankrupt there are 2 calculations of companies in a specific period. The results of the calculation of the bankruptcy prediction of the Foster Model show that there are 26 calculations of not going bankrupt in a specific period or the entire period (quarter 1 of 2018 - quarter 3 of 2021) and in companies that are predicted to go bankrupt there are 4 calculations of companies in a specific period.

The results of the Zmijewski Model bankruptcy prediction calculation show that 30 calculated values fall into the category of companies that have the potential to experience bankruptcy in the entire period (1st quarter of 2018 – 3rd quarter of 2021). Because the value of X < 0, the company is in default. The results of the calculation of the bankruptcy prediction of the Grover Model show that 30 calculated values fall into the category of companies that have the potential to not go bankrupt in the entire period (1st quarter of 2018 – 3rd quarter of 2021). Because the value of G > 0.01, the company is not in a state of bankruptcy. Stock return movement show that company entertainment and movies experience fluctuation where that movement of stock returns in the period 1st quarter of 2018 – 3rd quarter of 2021.

Stock returns highest owned by MNC Studios International in the period 3rd quarter of 2021 amounted to 0.54 and stock returns lowest owned by MNC Studios International in the period 3rd quarter of 2018. Calculation results from stock return movement this seen existence fluctuation increase or drop stock return value from period 3rd quarter 2018 to 3rd quarter of 2021. The results of the Altman model panel data regression t-test can be seen in Table 1 shows that the Altman Model significant value is 0.8846 where the significant value is > 0.05, then H0 is accepted, and it can be concluded that the Altman Model significantly does not affect stock returns.

The Springate model shows that the significant value of the t-test results is 0.3523, where a significant value > 0.05 can be seen in Table 2, then H0 is accepted. It can be concluded that the Springate model significantly does not affect stock returns. The results of the t-test of the Ohlson Model in Table 3

show that the significant value is 0.5530 where the significant value is > 0.05, then H0 is accepted, and it can be concluded that the Ohlson Model has no significant effect on stock returns.

The Foster model in Table 4 shows that the significant value of the t-test results is 0.6403 where the significant value is <0.05, then H0 is accepted, and it can be concluded that the Foster Model significantly does not affect stock returns. Table 5 shows the results of the Zmijewski Model t-test of 0.7516 where the significant value is > 0.05, then H0 is accepted, and it can be concluded that the Zmijewski Model significantly does not affect stock returns. The results of the t-test of the Grover Model in Table 6 show that the significant value is 0.5600 where the significant value is > 0.05, then H0 is accepted, and it can be concluded that the Grover Model significantly does not affect stock returns.

V. Conclusions

The results of the bankruptcy prediction from this study using the Altman, Springate, Ohlson, Foster, Zmijewski, and Grover models has no significant effect on stock returns, so to see the condition of a company is not enough to examine financial statements; but can pay attention to external factors that affect stock returns, including the country's economic conditions, natural conditions, politics, government regulations and issues originating from within or outside the country.

This research is expected to provide knowledge and insight, especially in the field of financial management, namely the analysis of the ability of financial managers to the Analysis of the Effect of Bankruptcy Predictions with the Altman, Springate, Ohlson, Foster, Zmijewski, and Grover models of Stock Returns in Entertainment and Film Companies Listed on the Stock Exchange. Indonesia in 2018-2021. Based on the research that has been done, the author is very aware that this research still has limitations. For further research, it is expected to be able to analyze on different samples.

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