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Influence of bankruptcy prediction and residual income on company share prices in various industry sectors

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ABSTRACT

Research use the panel data regression analysis model aims to determine the predictions of bankruptcy with the Altman Z-Score model and residual income influence the stock prices of companies listed in the Indonesian Syariah Stock Index (ISSI) in the period 2014 to 2018. Research This is a quantitative study using secondary data in the form of annual financial statements published by companies, with sampling using purposive sampling to obtain a sample of 23 manufacturing companies engaged in various industrial sectors. The research method uses the fixed effect model approach. The analysis said that the bankruptcy prediction using the Altman Z-Score model showed a significant negative effect on stock prices, while residual income had no effect on stock prices. In addition, the Altman Z-Score shows that many companies enter the gray area cut-off point and even go bankrupt, thus making shareholders reduce their share prices for the safety of their shares in the capital market.

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Pengaruh prediksi kebangkrutan dan residual income terhadap harga saham perusahaan sektor aneka industri. Penelitian dengan menggunakan model analisis regresi data panel ini memiliki tujuan untuk mengetahui prediksi kebangkrutan dengan model Altman *Z-Score* dan *residual income* memberikan pengaruh terhadap harga saham perusahaan-perusahaan yang terdaftar dalam Indeks Saham Syariah Indonesia (ISSI) pada periode 2014 sampai dengan 2018. Penelitian ini merupakan penelitian kuantitatif dengan menggunakan data sekunder berupa laporan keuangan tahunan yang diterbitkan perusahaan, dengan pengambilan sampel menggunakan *purposive sampling* sehingga didapatkan sampel sebanyak 23 perusahaan manufaktur yang bergerak pada sektor aneka industri. Metode penelitian menggunakan pendekatan fixed effect model. Hasil analisis mengatakan bahwa prediksi kebangkrutan menggunakan model Altman *Z-Score* menunjukkan pengaruh yang negatif signifikan terhadap harga saham, sementara r*esidual income* tidak berpengaruh terhadap harga saham. Selain itu Altman *Z-Score* menunjukkan banyak perusahaan yang masuk ke dalam cut off point *grey area* bahkan bangkrut, sehingga membuat para pemegang saham menurunkan harga sahamnya demi keselamatan saham mereka di pasar modal.

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1. Introduciton

Investment is a commitment to a number of funds or other sources of funds made at this time with the aim of obtaining a number of benefits in the future. The term investment can be related to various activities. Investing a number of funds in *real assets* (land, gold, machinery, or buildings) or *financial assets* (deposits, stocks, or bonds) is a common investment (Yudiana, 2012).

Investing in shares lately is increasingly preferred by the people of Indonesia. Data of *Kustodian Sentral Efek Indonesia* or abbreviated as KSEI also shows, young people aged 21 to 31 years dominate the number of investors in the stock market at this time which is 34.08%. According to Sani, Soewito, and Bagus (2011), stock is one type of investment that promises high returns to investors because it is high risk-high return. But stock prices also have a fluctuating nature, which is easy to change, so in investing investors need to know the factors affecting stock prices.

Discussing of stocks, of course also discuss its return. *High Risk High Return*, *risk* and *return* are conditions experienced by companies, institutions and individuals or investment decisions have been made, both in the form of losses and profits, in an accounting period. In the investment world, there is a strong relationship between *risk* and *return*. Both have a linear relationship.

Changing stock prices pose risks. Prices are too low can make the value of the company is also low. Unlike if the stock price is high then the value of the company is also high. High company value will make the market believe not only in the company's current performance but in the company's prospects in the future. The higher the share price, the higher the shareholder prosperity (Sambora, Handayani, & Rahayu, 2014). From here it can also be seen the risk of bankruptcy that might occur. Bankruptcy potential can be analyzed by predicting bankruptcy, which is calculating financial ratios using the formula from the Altman *Z-Score* model.

The price of share itself was influenced by external and internal factors of the company. External factors are directly related to the condition of the company but from external factors such as interest rates, inflation rates, foreign exchange rates and so forth. While internal factors are factors directly related to the performance or condition of the company can be seen from the company's operational financial statements. With this information it can be seen the movement of stock prices and to determine shareholders in deciding whether to sell or buy shares (Agustina & Sumartio, 2014).

In addition to the company's value, predicting stock prices can also be used by the company's performance. Company performance is used in finding the *Residual Income* Model. This model is one method can be used to measure a company's financial performance. Measuring financial performance is important because good financial performance is a benchmark for potential investors to invest in a company (Sani et al., 2011). *Residual Income* itself is obtained from reducing the company's net profit with the imposition of investment.

Research from Higgins (2011) said the *Residual Income Model* (RIM) has been widely accepted as a theoretical framework for valuing equity based on fundamental information from accounting data. The successful RIM application contributes in a fundamental perspective to pricing decisions, measuring abnormal income as a difference between analysis estimates and capital costs. Whereas the *residual income* model examined by Sani et al. (2011), said that partially *residual income* does not have a significant effect and has a negative relationship with stock prices, this shows that *residual income* is still less relevant in predicting stock prices.

Companies have assessed the performance of their companies using the *Residual Income* model also need to maintain a *going concern* opinion or the viability of their company. With the going concern, a business entity is considered to be able to maintain its business activities in the long term, it will not be liquidated in the short term. To maintain the survival assumption of a business entity

one needs to do one of them by predicting the potential for bankruptcy, revealed by Wibisono (2013). This is important for the sake of a good valuation predicate for investors.

In addition to maintaining the assumption of a company's survival, bankruptcy predictions can also be used to predict the stock price of a company. One of the models used to predict bankruptcy is using the Altman *Z-Score*, this is because the level of accuracy of this model is the highest compared to other models, namely the Springate model and the Zmijewski model (Juliana, 2012).

The selection of the Altman Z-Score model is to determine the potential for bankruptcy because this model is a model has 100% accuracy. The Altman Z-Score model analyzes all aspects of ratios in financial statements, such as activity ratios, liquidity ratios, profitability ratios, and solvency ratios so as to make the bankruptcy prediction method the most effective model compared to other models (Savitri, 2012).

In line with what said Juliana (2012) in her research, namely that the model that predicts bankruptcy is the best Altman *Z-Score* model, because the highest bankruptcy prediction is 15 companies starting from 2009-2011, then followed by the Springate model of 7 companies, whereas for the Zmijewski model did not find companies that were predicted to go bankrupt or all companies that were predicted to be in good health. The high number of companies that are predicted to go bankrupt based on the Altman *Z-Score* model because Altman applies more cautious principles than the other two prediction models so that the analysis results obtained on the Altman *Z-Score* tend to always lead to bankruptcy of the company.

Research Jainur, Ruwanti, and Iranita (2016) said the results of the research partially showed that the Altman *Z-Score* variable had a significant effect on stock prices with a determinant coefficient (*adjusted Rsquare*) of 0.530. This shows that 53% of the share price variable can be explained by the Altman *Z-Score* variable. And there are differences in stock prices between healthy and unhealthy companies. This is inversely proportional to what is said by Ardian and Khoiruddin (2014) that the results of a simple regression analysis show the value of *Z-Score* has no effect on stock prices.

In this study, the authors want to examine the potential for bankruptcy and *residual income* of companies that are members of ISSI. The choice of shares entered into ISSI because ISSI is an overall sharia stock index on the Indonesia Stock Exchange, whereas if a research sample is taken from JII, this is a sample for liquid company shares which is ensured to have the highest average daily transaction value on the regular market this means the company's performance they are good so that bankruptcy predictions are obtained at healthy levels (www.idx.co.id).

Based on the explanation above, the writer wants to know whether the calculations of the *Residual Income* Model and prediction of bankruptcy using the Altman *Z-Score* model can affect the price of the shares of companies listed on the Indonesian Syariah Stock Index.

2. Literature Review

Indonesian Sharia Stock Index

The Indonesian Sharia Stock Index (ISSI) was launched in 2011 to be a reference for investors investing in stocks, especially sharia stocks. Even this index will be the main indicator that can describe the performance of all Islamic stocks listed on the Indonesia Stock Exchange (IDX). In the same year the *Shariah Online Trading System* was also launched. This system is based on the criteria and principles of Islamic sharia where *margin trading* and *short selling* are prohibited, transactions must be cash, separate portfolios, and not transact on illicit shares but only transact on sharia shares (Soemitro, 2009).

Bankruptcy Predictions for Share Prices

In a study conducted by Hikmah (2018) The test results show that the Altman *Z-Score* variable: 1) *Working capital to total assets*, 2) *Retained earnings to total assets*, 3) *Earning before interest and taxes to total assets*, 4) *Market value of sequity to book value of total debts*, and 5) *Sales to total assets* have a positive and significant effect on share prices in the sub-sector of metal and as similar on the Indonesia Stock Exchange, the average company is in the *greyarea* position.

The results of the study partially showed that the Altman *Z-Score* variable significantly influenced the stock price with a determinant coefficient (*adjusted Rsquare*) of 0.530. This shows that 53% of the share price variable can be explained by the Altman *Z-Score* variable. And there are differences in stock prices between healthy and unhealthy companies (Jainur et al., 2016).

The results of this study find evidence that the Ohlson prediction model and the Altman modification are the dominant prediction models having a positive effect on the stock prices of coal companies in Indonesia. This indicates that the bankruptcy prediction model can be used to predict stock price movements and financial performance of the coal industry in Indonesia (Syamni, Majid, & Siregar, 2018).

Based on research presented by Hikmah (2018); Jainur et al. (2016); Syamni et al. (2018) uniformly said that predicting bankruptcy by using the Altman *Z-Score* model produced a positive effect in influencing stock prices, thus forming the first hypothesis namely as follows,

H1: Bankruptcy prediction has a positive effect on the stock prices of companies listed on ISSI.

***Residual Income* to Share Prices**

For the purpose of valuing equity, it is important to assess the factual fundamental economic strength of a company. Over the past decade, the *Residual Income Model* (RIM) has been widely accepted as a theoretical framework for valuing equity based on fundamental information from accounting data. The RIM application was successfully used to contribute in a fundamental perspective to the pricing decision, the results of the test said it had a positive effect on stock prices (Higgins, 2011).

Other findings show that the *residual income* model and Ohlson's version can influence the empirical relationship between stock prices and accounting figures. The researcher also said that finally there was another opportunity to identify variables other than income and book value by using the Ohlson model and *residual income*. Both can provide a strong theoretical foundation for future research (Pirie & Smith, 2006).

Higgins (2011); Pirie and Smith (2006) concluded in their research that *Residual Income* has a positive influence on stock prices, thus forming the second hypothesis of this writing, namely,

H2: *Residual income* has a positive effect on the stock prices of companies listed on ISSI.

As for the Research Framework as shown in Figure 1.

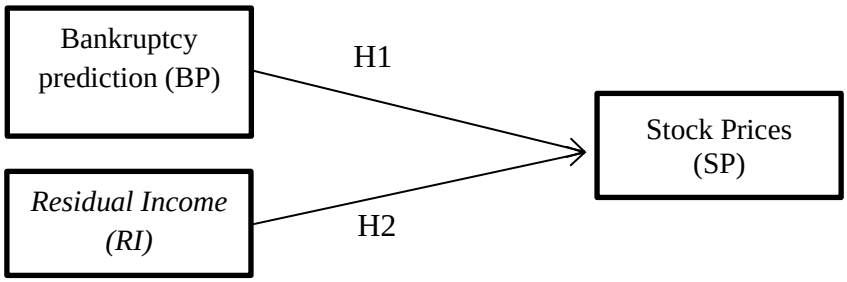

Figure 1. Research Framework

3. Research Method

This research uses descriptive quantitative research. Quantitative descriptive research that refers to numbers and empirical data from a variable examined through statistical procedures in order to obtain evidence and results from existing hypotheses (Indriantoro & Supomo, 2009).

This research was conducted by looking at and taking Indonesian Sharia Stock Index data on the official website of the Indonesia Stock Exchange, www.idx.co.id and annual financial reports published by companies which shares are listed on ISSI. To analyze bankruptcy prediction and *residual income* for the company, the financial statements will take data in the form of total assets, current assets, current debt, working capital, retained earnings, EBIT (*Earning Before Interset Tax*), total capital, total debt, and sales of a company. The data collection and collection carried out in August 2019. The detailed definition of the variable is as follows.

Bankruptcy Prediction Altman Z-Score Model

This model uses discriminant analysis which classifies research into one of several groups based on individual characteristics of the study. The Altman model uses financial ratio, namely liquidity ratio, solvability ratio, activity ratio, and profitability ratio to be analyzed. Altman then formulated his calculation model as follows (Oktaviandri, Firli, & Iradianty, 2015):

$$Z\text{-}Score = 1.2X_1+1.4X_2+3.3X_3+0.6X_4+1.0X_5$$

Note.

Z : *Bancrupty Index*
X1 *: Working Capital to Total Assets*
X2 *: Retained Earning to Total Assets*
X3 *: Earnings Before Interest and Taxes(EBIT) to Total Assets*
X4 *: Market Value of Equity to Book Value of Total Liabilities*
X5 : *Sales to Total Assets*

Cut off point:

Z<1,80 *: bankrupt,*
-1,8<Z<2,99 *: grey area,*
-Z>2,99 *: Area for healthy companies*

Residual Income

According to Sani et al. (2011) residual income is the company's profit less the burden of investment. The greater the profits of the company, the value of *residual income* will be higher.

The *Residual Income* calculation formula will be used in this study is as follows (Romadhani, Endang, & Sulasmiyati, 2016):

RI =*NOPAT*– Capital costs
=*EBIT(1-t)*–(*WACC* × Total assets)

Note:

NOPAT : operating profit after tax
EBIT : profit before interest and taxes
t : level of tax
WACC : weighted average of capital costs

Stock price

In general, shares are securities or proven of ownership of a company, in which there is a claim for income and profits from the company's operations (Atmadja, Saputra, & Vijaya, 2014). The share price used in this study is the *closing price*. In the Indonesia Stock Exchange, there are several forms of prices, there are opening prices (*pre-opening*), stock prices, and closing prices (*closing price*). In this study, the writer will take the closing price as the dependent variable. According to

the KBBI the closing stock price is the price of the securities traded at the end of the trading day's work.

The population in this study itself is a company which shares are listed in the Indonesian Sharia Stock Index (ISSI). While the criteria used in selecting samples are companies issuing financial statements. The sample is in the form of financial statements of companies listed on the Indonesian Sharia Stock Index for the period 2014 to 2018.

The sampling method used was *purposive sampling*. Like what was expressed by Atmadja et al. (2014), *purposive sampling* is a sampling technique by considering certain considerations. And the type of *purposive sampling* used is judgment sampling, which is a sampling technique by considering certain things and adjusted to the needs of the research conducted. After going through *purposive sampling*, the following data samples are obtained; 1) A total of 409 companies from various sectors are included in the Indonesian Sharia Stock Index group. 2) There are 79 manufacturing companies included in the Indonesian Syariah Stock Index group. 3) There are 33 manufacturing companies as research samples focused on the *Mis-Industry (Miscellaneous Industry* or various industries) sector registered with ISSI. 4) A total of 23 manufacturing companies engaged in various industrial sectors having complete data until 2018 were sampled in this study.

Using secondary data in the form of financial performance from financial statements published by companies listed on the Indonesian Sharia Stock Index (ISSI). This research is also supported by references in the form of books and journals in the library and the internet.

Data analysis method in this research uses panel data regression analysis model. Regression Analysis is the study of the dependence of one variable, namely the dependent variable, on one or more other variables (Gujarati & Porter, 2010). Panel data is a combination of time series data (between time) and cross-section (between individuals or spaces) (Gujarati & Porter, 2010). The panel data model estimation in general has three approaches namely *Common Effect*, Fixed effect, and Random effect (Iskandar et al., 2019; Mohammad & Firmansyah, 2018; Rofiuddin et al., 2019). Panel regression equation model with the general approach as follows:

$$LogHS_{it}=\beta_0+\beta_{1it}BP+\beta_{2it}RI+ut_{it}$$

Note:

LogHS : Logarithm of stock prices
BP : Bankruptcy prediction
RI : *Residual income*

With the intention that this study is also able to provide the coefficient (slope) of the same independent variable for each individual, the approach used in this study uses the *Fixed Effect Model*. This approach assumes the coefficient (slope) of the independent variable does not differ for each individual or between time. The *fixed effect* model technique is a technique for estimating panel data by using *dummy* variables to capture intercept differences. This estimation model is often called the *Least Squares Dummy Variables* technique.

4. Result and Discussion

Description of Research Object

Descriptive statistical test results indicate that the value of bankruptcy prediction is 7.546000, and the lowest is -0.190000. The highest Residual Income is 1.73E + 11 and the lowest is -3.40E + 11. While the highest share price is 16000, and the lowest is 50. The complete results of the descriptive statistics are as in Table 1.

Table 1. Result of Statistics Test of Data Descriptive

	BP	RI	HS
Mean	2.752522	-2.43E+10	1804.174
Median	2.421000	-52618449	790.0000
Maximum	7.546000	1.73E+11	16000.00
Minimum	-0.190000	-3.40E+11	50.00000
Std.Dev.	1.548939	6.36E+10	2559.223

Regression of panel data

Based on the *Fixed effects* approach the model produces estimates as shown in Table 2.

Table 2. Result of Estimation of *Fixed effects* model approach

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	7.134598	0.194155	36.74691	0.0000
BP	-0.192969	0.052215	-3.695657	0.0004
RI	1.11E-12	1.05E-12	1.053601	0.2949
R-squared	0.825654	F-statistic		17.75896
Adjusted R-squared	0.779162	Prob(F-statistic)		0.000000

Determination Coefficient Test

The results of the coefficient of determination test can be seen in Table 2, which shows the R-Squared of 0.825654 or 82.5654%. This means that stock prices can be explained by two independent variables, namely bankruptcy predictions and *residual income*. The remaining of 17,4346% is influenced by other factors. For *Adjusted R-Squared* has a value of 0.779162.

The results of the coefficient of determination test at the same time also shows that the stock price of companies listed in ISSI can be explained by 82.5654% by the independent variables namely bankruptcy predictions and *residual income*. The greater remaining of 17.4346% can be explained by other independent variables outside this study

Statistic F Test

Based on Table 2, the results of the statistical test f show that the independent variable is the prediction of bankruptcy and *residual income* has a significant effect on the stock prices of companies listed on ISSI because of the large probability of statistical f is equal to 0.000000 which is smaller than 0.05.

Statistical analysis f is used to determine whether there is a significant effect of the independent variable on the dependent variable. Evidenced by the statistical F probability smaller than 0.05. Therefore, it can be said that the bankruptcy prediction variable and *residual income* simultaneously influence the stock price.

Significant Test of Individual Parameters (t Test)

T test is used to determine whether the change in each independent variable can explain the change in the dependent variable. This method is carried out on the regression equation obtained from the relationship of each independent variable partially to the dependent variable by comparing the coefficient values in the significant column according to each independent variable. The results of the t test in detail are as in Table 3.

Table 3. Result of Statistic t Test

Variable	Coefficient	Std.Error	t-Statistic	Prob.	Remark
BP	-0.192969	0.052215	-3.695657	0.0004	Significant
RI	1.11E-12	1.05E-12	1.053601	0.2949	Insignificant

Effect of Bankruptcy Prediction on Stock Prices

Based on Table 3 the first hypothesis can be stated that bankruptcy predictions have a significant negative effect on stock prices. Shown with a coefficient of -0.192969 and a probability value of 0.0004. This is because the probability is 0.0004 which is smaller than 0.05 (0.0004 <0.05), therefore it can be seen that the prediction of bankruptcy partially has a significant effect on stock prices. While the negative coefficient causes bankruptcy predictions to have a negative effect on stock prices.

Thus, it can be explained that bankruptcy predictions have a negative and significant effect on stock prices, so the higher the bankruptcy prediction, the lower the stock price. This can be seen in the period of the research year 2014 to 2018, many companies were studied included in the category of grey area and even went bankrupt, so from that it caused doubts from potential investors that it could reduce stock prices. When a company goes bankrupt or grey area, the actions of investors will sell their shares at a low price to save the shares.

The results of the study partially showed that the Altman *Z-Score* variable had a significant effect on stock prices. with a determinant coefficient (*adjusted R square*) of 0.530. This shows that 53% of the share price variable can be explained by the Altman *Z Score* variable. And there are differences in stock prices between healthy and unhealthy companies (Jainur et al., 2016). Empirically these results are not in line with research conducted by Hikmah, (2018); Jainur et al. (2016), as well as Syamni et al. (2018), whose explain that bankruptcy predictions produce a positive influence in influencing stock prices.

Effect of *Residual Income* on Stock Prices

Answering the second hypothesis, is there any effect of *residual income* on stock prices can be seen in Table 3, that *residual income* does not affect stock prices. Shown with a coefficient of 1.11E-12 and a probability value of 0.2949. This is because the probability value is greater than 0.05 (0.2949> 0.05) so that *residual income* partially does not have a significant effect on the dependent variable, namely stock prices.

This is due to the sample of companies studied over a span of 5 years many show negative results, this means that the *residual income* of a company has decreased so as to cause a decrease in dividends to be distributed to shareholders. Thus this study shows that *residual income* does not affect stock prices, so the greater the *residual income*, it does not have an impact on the high or low stock prices.

Residual income which shows a positive number, basically indicates that the company has a lot of *residual income* or has increased, causing investors to be interested in investing their shares in the company. Thus the shareholders will increase the price of their shares. However, this condition does not apply, because the results of this study *residual income* does not affect the stock price. Empirically this study is not in line with research by Higgins (2011); Pirie & Smith (2006) who found that *Residual Income* had a positive influence on stock prices.

5. Conlusions

The results of the research showed that bankruptcy prediction with the Altman *Z-Score* had a significant negative effect on the stock prices of companies listed on ISSI, so that a high bankruptcy prediction had an effect on stock prices being low. While *Residual Income* (RI) has no influence on stock prices, even though it has a positive coefficient value does not have any impact on the condition of stock prices.

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