

CHAPTER III

OBJECT AND RESEARCH METHODS

3.1 Object of the Research

The object of the research is basically the targeted data that the researcher wishes to use. According to Sugiyono (2011:38) the definition of object of research is “ the object of research is an attribute or nature or value of a person, object or activity which may have certain variations applied by researcher to learn and then draw conclusions”. Objects of research are what are going to be investigated during a research.

This research uses a particular approach to financial management. The effect of the Stock Price with regards to the financial ratios on manufacturing companies. Investors analyses the performance of the companies by the use of financial statements. The Stock Prices that are going to be used are the closing prices for the years closing 2011 to the year closing 2015 as listed in the stock exchange. The objective of this research is to analyse the effect of the Price Earning Ratio, Debt to Equity Ratio, Return on Assets, Price to BookValue and the Earning per Share on the Stock Price of those manufacturing companies that are listed in the Indonesian Stock Exchange.

3.2 Operational Variables

Operational variables are the elements that will be observed in this research that will lead to the concept of measuring, quantifying and validating indexes for the variable that will be used. Not all variable are easily measured. This research uses two variable which are independent variables and dependent variables.

The independent variables in this research are the Price Earning Ratio (X_1), Debt to Equity Ratio (X_2), Return on Assets (X_3), Price to Book Value ratio (X_4) and the Earning per Share (X_5), whereas the dependent variable is the Stock Price (Y).

1. Independent Variables

a. Price Earning Ratio (X_1)

This shows how much money an investor is willing to pay for every rupiah of profit that will be reported.

b. Debt to Equity Ratio (X_2)

This measures the percentage of funds that will be given by creditors. The amount of debt that the company will owe.

c. Return on Assets (X_3)

This ratio measure the rate of return on the total assets of the company. It shows how profitable a company is relative to its total assets.

d. Price to Book Value (X_4)

This describes the ratio in the market of the stock price to the book value. It compares the market price to the book value.

e. Earning per Share (X_5)

This is the measure of the amount of payback for every one share invested. It serves as an indicator of the company's profitability.

2. Dependent Variable

Dependent variables are usually influenced by the independent variables. In this research the dependent variable is only one which is the Stock Price (Y). The price that is used in this research is the closing price of stock in the market.

The table below will describe the different variables and their measure of scale.

Table 3.1
Operational Variabe

No.	Variable	Definition	Scale	Formula
1.	Stock Price	The price at which a share is bought in the market.	Rupiah	Historical Prices as Found in the Stock Exchange.
2.	Price Earning Ratio	PER is a valuation measure that compares the level of Stock Prices to the level of profits of the company.	Ratio	Price Per Share / Earnings Per Share (EPS)
3.	Debt to Equity Ratio	Expressed as a percentage, it shows the proportion of equity and debt a firm is using to finance its assets, and the ability for shareholder equity to fulfill obligations to creditors in	Percentage	Total Liabilities / Total Shareholders' Equity

No.	Variable	Definition	Scale	Formula
		the event of a business decline.		
4.	Return on Assets	It is an indicator of how profitable a company is relative to its total assets. It gives an idea as to how efficient management is at using its assets to generate more earnings.	Ratio	$\text{Net Income} / \text{Total Assets}$
5.	Price to Book Value	PBV compares a stock's market value to its book value.	Ratio	$\text{Stock Price} / (\text{Total Assets} - \text{Intangible Assets And Liabilities})$
6.	Earning per Share	This is the portion of a company's profit that is allocated to each outstanding share of common stock.	Ratio	$(\text{Net Income} - \text{Dividends on Preferred Stock}) / \text{Average Outstanding Shares}$

Source: prepared by Researcher

3.3 Population and Sample

Population in research can be defined to be the complete set of elements that possess some common characteristics that are used in a research. The population of this research is manufacturing companies that are listed in the Indonesia Stock Exchange from the year 2011 to 2015. The companies that will be used in this research are all manufacturing companies that are listed in the Indonesia Stock Exchange, a total of 487 companies. The data is taken on yearly basis for a period of 5 years. For the amount of data that is required it is described in the table below:

Table 3.2
Total Amount Of Data per Year

No.	Instrument	Total data
1.	Price Earning Ratio	487
2.	Debt to Equity Ratio	487
3.	Return on Assets	487
4.	Price to Book Value	487
5.	Earning per Share	487
6.	Stock Price	487

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Total	2890
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Source :idx.co.id

. In order to meet the objectives of this research, the data that will be used includes the Stock Price, Price Earnings Ratio, Debt to Equity Ratio, Return on Assets, Price to Book value and the Earning per Share. The data that is used to on yearly basis.

3.4 Sampling Technique and Source of Data

Sampling is part of the population that is used as the subject of the research which shows the number of elements that were used. No sampling technique was used in this research because it will use all the companies that are listed in the IDX. Thus, this research consists of all manufacturing companies that are listed in the Indonesia Stock Exchange in the years 2011 – 2015.

The type of data being used in this research is secondary data. Secondary data is data that is not obtained directly from the sources. In this research, the secondary data is obtained from the balance sheet and the income statement of the companies and data calculated by the researcher and the historical prices as seen in the Indonesia Stock Exchange from the years 2011 – 2015. The method of collecting data include documentation of the financial statements and historical Stock Prices.

The table below will show a descriptive source of the data.

Table 3.3
Source Of Data

No.	Data	Site
1.	Stock Price	www.idx.co.id
2.	Price Earning Ratio	www.idx.co.id
3.	Debt to Equity Ratio	www.idx.co.id
4.	Return on Assets	www.idx.co.id
5.	Price to Book Value	www.idx.co.id
6.	Earning per Share	www.idx.co.id

Source : Prepared by Researcher

3.5 Analysis of Data

The historical data used in this research is then processed by reference to the similarities that exist in the previous chapters. Since the data is a lot and complex, there is need to have the help of a statistical computer program the SPSS. The data analysis

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technique is a way to measure, process and analyze the data in order to test the hypothesis. The purpose of data processing is to provide useful information, as well as to test the hypothesis that have been formulated in the study. The research design uses descriptive statistics and verification. Descriptive statistics for quantitative variables and verification for testing the hypothesis by using classic assumption test.

3.6 Classic Assumption Test

Classic assumption test is used to test the data on a research using regression analysis techniques. The assumption is that if there is an aspect of autocorrelations, heteroscedasticity and multicollinearity among independent variables in the regression. Once these models that need to be tested meet the classical assumption test, and regression, the next step performed is either the t test or the f test.

3.6.1 Normality Test

Normality test aims to test whether the data that will be used in the regression model has a normal distribution or not. Normality test tests the effect of the independent variable to the dependent variable. The test results indicate whether you should reject or fail to reject the null hypothesis that the data come from a normally distributed population. If it is below 0.05, the data significantly deviates from the normal distribution.

3.6.2 Heteroscedasticity Test

This test aims to test whether the regression model has any inequality or variance from one observation to another observation. A good regression is when it is homoscedasticity or when heteroscedasticity has not occurred. The presence of heteroscedasticity in regression can be determined in number of ways one of which is the Glesjer test. If the independent variables shows a statistically significance influence on the dependent variable, then it shows that there is presence of heteroscedasticity. If the level of significance is more than 5%, then there is no presence of heteroscedasticity.

3.6.3 Multicollinearity Test

Multicollinearity test aims to test whether the regression model shows any relation between the independent variables. A good model should not show any correlation between the independent variables. If the independent variables shows any

correlation, then they are not orthogonal (statistically independent). When the correlation between independent variables is equal to zero (0), then they are orthogonal variables. To detect the presence or absence of multicollinearity in the regression model, the following will be considered;

- a. Variance inflation factor or the tolerance value where if there is an absence of multicollinearity then, tolerance value will be more than ($>$) 0.1 and the VIF will be less than ($<$) 10.
- b. If the correlation bet the independent variables is more than ($>$) 0.5, then it shows that there is a problem of multicollinearity and the vice versa is true.

3.6.4 Auto-correlation

This test aims to check whether in a linear regression model, there is no correlation between the standard error in a period t with an error in previous period $t-1$. To detect autocorrelation, the model to be used is the Durbin Watson test (d^2) with the formula:

$$d = \frac{\sum_{i=2}^n (e_i - e_{i-1})^2}{\sum_{i=1}^n e_i^2}$$

Where n is the number of observations. Since d is approximately equal to $2(1-r)$, where r is the sample autocorrelation of the residuals, $d = 2$ indicates no autocorrelation. The value of d lies between 0 and 4. If the value is less than 2, then there is evidence of positive serial correlation. If the value is more than 2, then there is evidence of a negative serial correlation.

TABLE 3.4
DURBIN – WATSON TEST d

Positive Autocorrelation	Inconclusive	No Autocorrelation	Inconclusive	Negative Autocorrelation
←→	←→	←→	←→	←→

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0 d_L d_U 2 $4 - d_U$ $4 - d_L$ 4 Source:
 Prepared by Researcher

TABLE 3.5
RESULTS FOR AUTOCORRELATION

Value of statistics d	Results
Positive Correlation	
$d < d_{L,\alpha}$	There is a statistical evidence that the error terms are positively autocorrelated.
$d > d_{u,\alpha}$	There is no statistical evidence that the error terms are positively autocorrelated.
$d_{L,\alpha} < d < d_{u,\alpha}$	The test is inconclusive.
Negative Correlation	
$(4 - d) < d_{L,\alpha}$	There is a statistical evidence that the error terms are negatively autocorrelated.
$(4 - d) > d_{u,\alpha}$	There is no statistical evidence that the error terms are negatively autocorrelated.
$d_{L,\alpha} < (4 - d) < d_{u,\alpha}$	The test is inconclusive.

Source: www.wikipedia.com

3.7 Discussion of Test Models

The models that are going to be used in this research are merely for the purpose of determining whether the test models can be relied and also to measure the ability of the independent variables. The test models also help in explaining the variations that might be seen with the dependent variable the Stock Price.

1. The coefficient of determination (R^2)

The coefficient of determination (R^2) essentially measure how much is the ability of the models of independent variables PER, DER, ROA, PBV and EPS in explaining the variations in the dependent variable Stock Price. The value of coefficient is between zero (0) and one (1). When the results of R^2 is small, it means that if the researcher uses the independent variable in order to ascertain the variations with the independent variable (Stock Price), then it will be

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difficult. The analysis will be limited. On the other hand, a value that is close to one (1) means that the independent variable (PER, DER, ROA, PBV and EPS) provides all the information that is need in order to predict the variations of the dependent variable.

The drawbacks that come with the model is that the use of coefficient of determination is based on the number of independent variables in the intended model. With every additional one independent variable, then the R^2 will not have any change whether the variables significantly influence the dependent variables or not. Therefore, many researchers advocate for the use of Adjusted R^2 when evaluating with the best regression model. Unlike R^2 , the value of the Adjusted R^2 may rise or fall when one independent variable is added to the model. For data processing using this model, researchers usually use a computer application program Microsoft Excel.

2. The F-Test

Testing hypothesis with the F-test aims to determine the significance regression, so as to know whether the model can be relied. With this model, the researcher can see the significance of the influence of independent variables on the dependent variable simultaneously with $\alpha = 0.05$.

The acceptance or rejection of the hypothesis with the use of this test is in accordance to the results below:

a. Formulation of hypothesis

$H_0 : \beta_1, \beta_2, \beta_3, \beta_4, \beta_5 = 0$: No significant effect between the independent variables PER, DER, RoA, PBV and EPS on the dependent variable Stock Price.

$H_0 : \beta_1, \beta_2, \beta_3, \beta_4, \beta_5 \neq 0$: There is a significant effect between the independent variables PER, DER, RoA, PBV and EPS on the dependent variable Stock Price.

b. Conclusion

H_α : accepted if $\leq \alpha = 0.05$

H_α : rejected if $< \alpha = 0.05$

3. Multiple Linear Regression

Since there will be more than one independent variables to be tested to determine the effect on the dependent variable, the process of regression analysis is performed. The multiple regression analysis is used to determine the effect of these independent variables on the dependent variable on the change each increase or decrease in the independent variable that will affect the other variables.

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5$$

Where:

Y	=	Stock Price
a	=	Constant
b	=	Regression coefficient
X ₁	=	PER _{t-1} (Price Earning Ratio)
X ₂	=	DER _{t-1} (Debt to Equity Ratio)
X ₃	=	RoA _{t-1} (Return on Assets)
X ₄	=	PBV _{t-1} (Price to BookValue Ratio)
X ₅	=	EPS _{t-1} (Earning per Share)