CHAPTER III

RESEARCH METHODOLOGY

3.1 Population and Samples

Population is all of element that shows the special characteristic that can use for creating the conclusion (Sanusi, 2013). The research population is all of firm that listed in the Indonesia Stock Exchange (IDX). Base on the data of companies that have been listed until year 2016, there are 525companies.

Based on research of AndiSupangat (2007) in AniRachmawati (2013), Sample is the part of population that using as a research objects that taking from the population as the representative of the population. From the population, it will be sampled. The sample method that used in this research is using purposive sampling. Purposive sampling is the sampling method that used some criteria to select the samples (Amalia and Kristjiadi, 2003). The criteria that used in this research are:

a) Manufacturing company has been listed in the Indonesia Stock Exchange in period 2010-2015.

b) The company has been published their financial statement in period 2010-2015.

c) The company has completed data of financial statement in the Indonesia Stock Exchange (IDX).

3.1.1 Company as Sample

a) The manufacturing that listed on Indonesian Stock Exchange are 534 companies.

b) The manufacturing company that listed on the Indonesia Stock Exchange (IDX) from year 2010-2015 are 51 companies.

c) The companies that use as sample on this research are 29 companies that fulfill the financial report from year 2010-2015.

Table 2
List of 29 Manufacture Companies as Samples

AMFG	Asahimas Flat Glass Tbk
ASII	Astra International Tbk
AUTO	PT Astra OtopartsTbk
BATA	Sepatu Bata Tbk
BRAM	Indo KordsaTbk
BRNA	PT BerlinaTbk
CTBN	PT Citra TubindoTbk
DLTA	Delta Djakarta Tbk
EKAD	PT Ekadharma International Tbk
GDYR	Goodyear Indonesia Tbk
GGRM	PT GudangGaramTbk
HMSP	HM SampoernaTbk
IGAR	PT Champion Pacific Indonesia Tbk
INTP	PT Indocement Tunggal Prakarsa Tbk
KAEF	Kimia Farma (Persero) Tbk
KLBF	Kalbe FarmaTbk
LION	Lion Metal Works Tbk
LMSH	PT Lionmesh Prima Tbk
MAIN	MalindoFeedmillTbk
MRAT	MustikaRatuTbk
MYOR	Mayora Indah Tbk
SCCO	Supreme Cable Manufacturing & Commerce Tbk
SMSM	SelamatSempurnaTbk

SQBB	PT Taisho Pharmaceutical indonesiaTbk
TKIM	PabrikKertas Tjiwi Kimia Tbk
TOTO	PT Surya Toto Indonesia Tbk
UNIC	PT Unggul Indah CahayaTbk
UNTR	PT United Tractors Tbk
UNVR	Unilever Indonesia Tbk

Source : www.idx.com

3.2 Data and Data Gathering

3.2.1 Type of Data

This research is using secondary data as main data which means the data have been processed and published by partly entailed (Supranto, 1987). Secondary data that used in this research are getting from the data that have been processed and published by Jakarta Stock Index (IDX)

3.2.2 The Data Use in the Research

Every research exactly has variable as the item that will be run in the research. In this research the variable that will run are the independent variable and the dependent variable. As usually, the relation of these two variables is the dependent variable is influence by the independent variable. The independent variable is the capital structure. There are five the proxy of capital structure in this research, which is Debt to Equity Ratio (DER), Debt to Equity Ratio, Debt to Assets Ratio (DAR), Tangibility, Interest Coverage Ratio (ICR), and Financial Leverage Multiplier (FLM). The dependent variable that use in this research is the firm value, whereas the proxy of firm value is Price to Book Value. The data that use in this research are Total Debt and Total Equity that need to find the Debt to

Equity Ratio, Total Liabilities and Total Assets that use to find Debt to Assets Ratio, Total Fixed Assets and Total Assets that use to find the Tangibility, Earning Before Interest & Tax and Interest Expense to find the Interest Coverage Ratio, and the last are Total Assets and Share Capital that use to find The Financial Leverage Multiplier.

3.2.3 Source of Data

The data that will run is secondary data that can be finding from the website of the Indonesia Stock Index (IDX). The website address is www.idx.co.id. The IDX's website will provide the data for every each year.

3.3 Research Variable

The research variables can be separate into two parts which is independent variable and dependent variable. Independent variable is variable that influence the related variable. And the dependent variable is the variable that influenced by the independent variable.

3.3.1 Independent Variable

The independent variables are variable that varied or manipulated by the researcher. And independent variable is the presumed cause, whereas the dependent variable is the presumed effect (Dependent and Independent variable). And the independent variable of this study is the capital structure. The proxy of capital structure is Debt to Equity Ratio (DER), Debt to Assets Ratio (DAR), Tangibility, Interest Coverage Ratio (ICR), and Financial Leverage Multiplier (FLM).The Debt to Equity Ratio

is finding from Total Debt divided by Equity of share holder. The Debt to Asset Ratio is finding from Total Debt divided by Total Assets. The Tangibility is finding from Total Fixed Asset divided by Total Assets. The Interest Coverage Ratio (ICR) is finding from Earning before Interest and Taxes (EBIT) divided by Interest Expenses. The Financial Leverage Multiplier (FLM) is finding from Total Assets divided by share capital.

The formula of the independent variables:

- **Debt to Equity Ratio** $= \dfrac{Total\ Liabilities}{Equity}$

Source : http://www.accountingtools.com/

- **Debt to Asset Ratio** $= \dfrac{Total\ Liabilities}{Total\ Assets}$

Source : JahirulHoque, Ashraf Hosshain, Kabir Hossain, (2015)

- **Tangibility** $= \dfrac{Total\ Fixed\ Assets}{Total\ Assets}$

Source : JahirulHoque, Ashraf Hossain, Kabir Hossain, (2015)

- **Interest Coverage Ratio** $= \dfrac{EBIT}{Interest\ Expense}$

Source : JahirulHoque, Ashraf Hossain, Kabir Hossain, (2015)

- **The Financial LeverageMultiplier** $= \dfrac{Total\ Assets}{Share\ Capital}$

Source : JahirulHoque, Ashraf Hossain, Kabir Hossain, (2015)

3.3.2 Dependent Variable

The dependent variable is the respond that is measured. The dependent variable in this study is the firm value whereas the firm value proxy is Price to Book Value. The price to book value can be getting from the comparison of Market price per share and Book value per share.

The formula of the dependent variable:

- **Price to Book value** =

$$\frac{Market\ Price\ per\ Share}{Book\ Value\ per\ Share}$$

Source :http://www.financeformulas.net/

3.4 Method of Analysis and Hypothesis Testing

3.4.1 Multiple Linear Regressions

Analysis technique that used in this study is multiple linear regressions. Model of equation can be written as follows (Fisher, 1922)

$$PBV = \alpha + \beta_1 DER + \beta_2 DAR + \beta_3\ TAN + \beta_4\ ICR + \beta_5\ FLM$$

Where:

PBV : Price to Book Value

DER : Debt to Equity Ratio

DAR : Debt to Assets Ratio

TAN : Tangibility

ICR : Interest Coverage Ratio

FLM : Financial Leverage Multiplier

e   : error

Multiple linear regressions is important as the basis for the analysis, considering fundamental research. This method of analysis is technique to find the relation among the variable. This means that if the coefficient b is positive (+), it will give a one direction impact between the independent variable with the dependent variable, any increase in the value of independent variable will lead to increase the dependent variable. Vice versa, if the coefficient value of n is negative (-), it indicates a negative effect which increase the value of the independent variable will result in impairment of the decrease in the dependent variable.

3.4.2 Classical Assumption Test

The test will test the statistic of the data based on the multiple linear regression using Ordinary Least Square (OLS) that generate Best Linear Unbias Estimator (BLUE). To identify and emphasize the relation of the data, the data of the research must be following the Classical Assumption Test. whereas: (Novi RehulinaSitepu, 2015)

1. Normality Test

This will test the residual value of that generate from the regression have a normal distribution or not. This test common use in the parametric statistic analysis good regression model will have residual value that distributed normally. To do the normality test the analysis is histogram, probability plot, and also Kolmogorov-Smirnov Z test. With knowing the normality of the data distribution we will know that the data centered in

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the average and median. We could know the normality from histogram Figure by seeing the form of the Figure if it forms a mountain then the distribution is normal. In the P-P Plot Figure, if the dot spreading near the diagonal the data is normal. Using Kolmogorov-Smirnov Z the significance should higher than 0.05.

2. Autocorrelation

Autocorrelation is the condition where in the regression model there are correlations between residual in the t period with residual in the period before (t-1). Good regression model is the regression that do not have autocorrelation problem. This test will be conduct by using Durbin Watson test. Autocorrelation test to test there are any error in the t period with error in the t-1 (Durbin,J and Watson, G.S, 1950).

Table 3
Durbin Watson Table

Durbin Watson	Explanation
0 –dL	Positive auto correlation
dL–dU	Doubt
dU - (4-dU)	There are no auto correlation
(4 - dU) - (4 - dL)	Doubt
(4 - dL) – 4	Negative auto correlation

3. Multicollinearity Test

Multicollinearity is the condition where in the regression model there are perfect correlations or perfect approach among the independent variable. In the good regression model it should be no perfect correlation. Statistic tool that often use to test the disruption of multicollienearity are Varian inflation factor (VIF), person correlation among independent variable, or seeing the eigenvalues and condition index (CI). Test Multicollinearity using tolerance and variant inflation factor (VIF) in the regression model or by compare the individual coefficient determinant (r^2) with the determinant value all at one (R2). To test the multicollinearity we could see from the tolerance and VIF. Tolerance will measure the variability of independent variable that not be explained by the other independent variable. So the low tolerance levels same with the high VIF. Cutoff value that commonly use to show there are multicollinearity is tolerance <0.10 or same with VIF>10. (Ghozali, 2006).

4. Heteroscedasticity Test

Heteroscedascity test aims to test whether the model regression occur inequality residual variance of one observation to other observation. A good regression model is going homocedasticity or that are no hetercedasticity. Detect the heterocedasticity done by seeing Figure plots from the value prediction of the dependent variable with the residual. With basic analysis:

1. If there are certain patterns, such as dots that form a pattern particular, regular (corrugated, wide, and narrowing), it has been indicated heterocedasticity.

2. If there is no particular pattern and the points spread above and below zero on the Y axis, there will be no heterocedasticity.

Analysis of the Figure plot has significant drawbacks because the number of observation affects the result plot. More and more small number of observations, the more difficult to interpreted the Figure plot.

3.5 Hypothesis Testing

Hypothesis testing is the use of statistics to determine the probability that a given hypothesis is true.

1). Thehyphothesis formula will be used to examine the hyphothesis of this research are;

H_0 : The Capital Structure does not impact the Firm Value

H_1 : The Debt to Equity Ratio has positive impact on Firm Value

H_2 : The Debt to Assets Ratio has negative impact on Firm Value

H_3 : The Tangibility has positive impact on Firm Value

H_4 : The Interest Coverage Ratio has positive on Firm Value

H_5 : The Financial Leverage Multiplier has positive impact on Firm Value

The examination will use the multiple Regression Analysis result. The condition of examination will be used to approve or reject the H_1, H2, H3, H4, H5.

If $p < \alpha$ the $H_{1,2,3,4,5}$ will be approve and H_0 will be rejected; but if $p > \alpha$ then H_a will be rejected and H_0 will be approve.

Where the alpha is 0.05 that the observed effect is statistically significant, the null hypothesis is ruled out, and the alternative hypothesis is valid.

2). t-Value Testing

T-Value Testing is using to test the influence of independent variable to the dependent variable partially. This testing method use to compare the t-count to the t-table.

3). F-Value Testing

F-Value Testing is using to test the influence of independent variable to the dependent variable simultaneously. This testing method use to compare the F-count to the F-table.

4). Adjusted R^2

Coefficient Determination (R^2) used to measure the ability of the model in explaining the variation in the dependent variable. The coefficient of determination can be searched by the formula (Gujarati, 1999):

$$R^2 = \frac{ESS}{TSS} = 1 - \frac{\sum ei^2}{\sum Yt^2}$$

Coefficient determination is between 0 and 1. R^2 values are small, means that ability of the independent variable in explaining the dependent variable is very limited (Ghozali, 2005). Value close to 1 means that the independent variable gives almost all the information needed to predict the variation of the variable dependent.