

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Object General Description

The objects of the research that will be taken for the research are all the companies listed in the IDXENERGY and LQ45 from the first quarter of 2020 to the third quarter of 2021. There are 7 periods which are: March 31st 2020, June 30th 2020, September 30th 2020, December 31st 2020, March 31st 2021, June 30th 2021, and September 30th 2021. According to IDX Classification Guideline (2021), the companies listed in the energy sector offers products and services related to extraction of energy. The earning of the companies is directly affected by commodity prices. Alternative energy is not an exception to the definition. IDXENERGY was launched on January 25th, 2021, as an index measuring the performance of all stocks in the Energy Sector based on the IDX Industrial Classification.

The LQ45 Stock Index is an index that investors also known as an index that measures the performance of 45 stocks in terms of price with the highest liquidity and the largest market capitalization, and is also supported by good company fundamentals. The LQ45 index covers 70% of the stock market capitalization and transaction value of the Indonesian stock market. This figure is considered to have represented the stock market as a whole so that it was used as the research population

The criteria needed for a stock to be included in the LQ45 Stock Index are as follows:

1. Included in the 60 stocks with the highest average transaction on the regular market for the last 12 months.
2. Of the 60 stocks, 45 stocks were selected based on market capitalization, transaction value, number of trading days, and frequency of transactions in the regular market for the last 12 months

3. The shares must be included in the calculation of the Jakarta Composite Index (JCI)
4. The shares have been listed on the Exchange for at least 3 months
5. The shares must have good financial condition, good growth prospects, high frequency of trading and transactions in the regular market

3.2 Research Method

The method used in this research is casual study. Casual Study (Sekaran & Bougie, 2019) is a study used to analyze the causal relationship between the independent variable and the dependent variable, as well as the influence between the two variables. The casual relationship seen is the correlation of profitability, asset tangibility, and firm size on leverage.

3.3 Research Population and Sample

3.3.1 Population

The research populations are all companies listed in IDXENERGY and LQ45. There are 73 listed companies in IDXENERGY and 51 listed companies in LQ45 during the period 2020-2021.

3.3.2 Sample

The sample are filtered from the population mentioned using the non-probability purposive sampling. This is a method that uses specific criteria (Sugiyono, 2013). These criteria are:

1. The annual report of the companies must be available from the first quarter of 2020. This indicates that the companies listed before 2020 are not included in the sample.
2. In addition to providing a clear picture of a company's value, market capitalization helps diversify portfolios with companies of varying sizes (Praveen Kumar & Manoj Kumara, 2021). Thus, these companies are considered very less likely to be risky. Large cap companies are considered to have a market value of a minimum \$10 billion. This implies to the capital market in

Indonesia, which according to Indonesia Stock Exchange (2021), the large cap has a market value of minimum IDR 10 billion. Based on the criteria above, the research used the data from large cap companies from IDXENERGY

3. The companies listed in LQ45 must be listed consecutively for 4 periods from 2020 to 2021.
4. Some companies in IDXENERGY are listed in LQ45. Thus, the companies listed in IDXENERGY will not be included for LQ45.

Based on the criteria mentioned, there are 11 companies listed as sample for IDXENERGY which results in total of 77 data. There are 34 companies listed as sample for LQ45 which results in total of 238 data.

Table 3.1 IDXENERGY Sample and Population

IDXENERGY Index			
No	Ticker	Company	Market Cap (Billion Rp)
1	BYAN	Bayan Resources Tbk.	144,486
2	ADRO	Adaro Energy Tbk.	86,360
3	TCPI	Transcoal Pacific Tbk.	51,625
4	PTBA	Bukit Asam Tbk.	37,901
5	PGAS	Perusahaan Gas Negara Tbk.	33,937
6	DSSA	Dian Swastatika Sentosa Tbk	33,880
7	ITMG	Indo Tambangraya Megah Tbk.	32,148
8	HRUM	Harum Energy Tbk.	28,922
9	GEMS	Golden Energy Mines Tbk.	28,528
10	MCOL	Prima Andalan Mandiri Tbk.	14,433
11	MEDC	Medco Energi Internasional Tbk	13,950
12	INDY	Indika Energy Tbk.	11,670
13	BSSR	Baramulti Suksessarana Tbk.	9,836
14	TOBA	TBS Energi Utama Tbk.	8,733
15	HITS	Humpuss Intermoda Transportasi	5,361
16	MBAP	Mitrabara Adiperdana Tbk.	5,325
17	BUMI	Bumi Resources Tbk.	4,308
18	ENRG	Energi Mega Persada Tbk.	4,195
19	MYOH	Samindo Resources Tbk.	4,015
20	SGER	Sumber Global Energy Tbk.	4,014

21	AKRA	AKR Corporindo Tbk.	3,673
22	DOID	Delta Dunia Makmur Tbk.	3,500
23	SMMT	Golden Eagle Energy Tbk.	3,386
24	BIPI	Astrindo Nusantara Infrastrukt	3,359
25	SURE	Super Energy Tbk.	2,957
26	PTRO	Petrosea Tbk.	2,752
27	SHIP	Sillo Maritime Perdana Tbk.	2,733
28	PSSI	Pelita Samudera Shipping Tbk.	2,557
29	TRAM	Trada Alam Minera Tbk.	2,482
30	MBSS	Mitrabahtera Segara Sejati Tbk	2,363
31	ELSA	Elnusa Tbk.	2,160
32	BULL	Buana Lintas Lautan Tbk.	2,109
33	KKGI	Resource Alam Indonesia Tbk.	2,050
34	TAMU	Pelayaran Tamarin Samudra Tbk.	1,875
35	BESS	Batulicin Nusantara Maritim Tb	1,643
36	MTFN	Capitalinc Investment Tbk.	1,592
37	DWGL	Dwi Guna Laksana Tbk.	1,585
38	APEX	Apexindo Pratama Duta Tbk.	1,516
39	RMKE	RMK Energy Tbk.	1,484
40	SOCI	Soechi Lines Tbk.	1,440
41	SUGI	Sugih Energy Tbk.	1,241
42	DEWA	Darma Henwa Tbk	1,180
43	TPMA	Trans Power Marine Tbk.	969
44	TEBE	Dana Brata Luhur Tbk.	919
45	GTSI	GTS Internasional Tbk.	918
46	INPS	Indah Prakasa Sentosa Tbk.	878
47	RAJA	Rukun Raharja Tbk.	778
48	ARII	Atlas Resources Tbk.	758
49	WINS	Wintermar Offshore Marine Tbk.	732
50	SMRU	SMR Utama Tbk.	625
51	ITMA	Sumber Energi Andalan Tbk.	509
52	MITI	Mitra Investindo Tbk.	493
53	CNKO	Exploitasi Energi Indonesia Tb	448
54	FIRE	Alfa Energi Investama Tbk.	434
55	KOPI	Mitra Energi Persada Tbk.	397
56	ARTI	Ratu Prabu Energi Tbk	392
57	BBRM	Pelayaran Nasional Bina Buana	268
58	UNIQ	Ulima Nitra Tbk.	248
59	LEAD	Logindo Samudramakmur Tbk.	206
60	RIGS	Rig Tenders Indonesia Tbk.	206
61	GTBO	Garda Tujuh Buana Tbk	188
62	JSKY	Sky Energy Indonesia Tbk.	181

63	BOSS	Borneo Olah Sarana Sukses Tbk.	168
64	RUIS	Radiant Utama Interinsco Tbk.	152
65	SEMA	Semacom Integrated Tbk.	139
66	PTIS	Indo Straits Tbk.	125
67	WOWS	Ginting Jaya Energi Tbk.	124
68	CANI	Capitol Nusantara Indonesia Tb	114
69	PKPK	Perdana Karya Perkasa Tbk	104
70	AIMS	Akbar Indo Makmur Stimec Tbk	62
71	ETWA	Eterindo Wahanatama Tbk	60
72	ADMR	Adaro Minerals Indonesia Tbk.	0
73	BSML	Bintang Samudera Mandiri Lines	0

Table 3.2 LQ45 Sample and Population

LQ45		
No	Ticker	Company
1	ACES	Ace Hardware Indonesia Tbk
2	ADRO	Adaro Energy Indonesia Tbk
3	AKRA	AKR Corporindo Tbk
4	ANTM	Aneka Tambang Tbk
5	ASII	Astra International Tbk
6	BBCA	Bank Central Asia Tbk
7	BBNI	Bank Negara Indonesia (Persero) Tbk
8	BBRI	Bank Rakyat Indonesia (Persero) Tbk
9	BBTN	Bank Tabungan Negara (Persero) Tbk
10	BMRI	Bank Mandiri (Persero) Tbk
11	BRPT	Barito Pacific Tbk
12	BSDE	Bumi Serpong Damai Tbk
13	BTPS	Bank BTPN Syariah Tbk
14	CPIN	Charoen Pokpand Indonesia Tbk
15	CTRA	Ciputra Development Tbk
16	ERAA	Erajaya Swasembada Tbk
17	EXCL	XL Axiata Tbk
18	GGRM	Gudang Garam Tbk
19	HMSP	HM Sampoerna Tbk
20	ICBP	Indofood CBP Sukses Makmur Tbk
21	INCO	Vale Indonesia Tbk
22	INDF	Indofood Sukses Makmur Tbk
23	INKP	Indah Kiat Pulp & Paper Tbk
24	INTP	Indocement Tunggal Prakarsa Tbk
25	ITMG	Indo Tambangraya Megah Tbk

26	JPFA	JAPFA Comfeed Indonesia Tbk
27	JSMR	Jasa Marga Tbk
28	KLBF	Kalbe Farma Tbk
29	LPPF	Matahari Department Store Tbk
30	MDKA	Merdeka Copper Gold Tbk
31	MEDC	Medco Energi International Tbk
32	MIKA	Mitra Keluarga Karyasehat Tbk
33	MNCN	Media Nusantara Citra Tbk
34	PGAS	Perusahaan Gas Negara Tbk
35	PTBA	Bukit Asam Tbk
36	PTPP	PP (Persero) Tbk
37	PWON	Pakuwon Jati Tbk
38	SCMA	Surya Citra Media Tbk
39	SMGR	Semen Indonesia (Persero) Tbk
40	SMRA	Summarecon Agung Tbk
41	SRIL	Sri Rejeki Isman Tbk
42	TBIG	Tower Bersama Infrastructure Tbk
43	TINS	Timah Tbk
44	TKIM	Pabrik Kertas Tjiwi Kimia Tbk
45	TLKM	Telkom Indonesia (Persero) Tbk
46	TOWR	Sarana Menara Nusantara Tbk
47	TPIA	Chandra Asri Petrochemical
48	UNTR	United Tractors Tbk
49	UNVR	Unilever Indonesia Tbk
50	WIKA	Wijaya Karya (Persero) Tbk
51	WSKT	Waskita Karya (Persero) Tbk

3.4 Data Collection Method

The data are collected for the research is secondary data. These are public disclosed data, which can be accessed by anyone. The data taken is in the form of financial report data taken from <https://www.idx.co.id/>

3.5 Operational Variable Table

Table 3.3 Operational Variable Table

Variable	Definition	Measurement	Scale	Reference
Dependent Variable				
Leverage	Debt used to measure the	$Leverage = \frac{Total\ Debt}{Total\ Assets}$	Ratio	Neves et al. (2020)

	ratio between total debt and total assets.			
Independent Variable				
Return on Asset	A ratio to show the portion of contribution to asset upon generating net profit.	$\text{Return On Asset} = \frac{\text{Earning Before Interest and Tax (EBIT)}}{\text{Total Assets}}$	Ratio	Heri (2015), Wijaya (2019)
Asset Tangibility	Asset Tangibility is defined to be related to amount of asset which can be converted to collateral in order to reduce the risk for the creditor.	$\text{Asset Tangibility} = \frac{\text{Tangible Fixed Assets}}{\text{Total Assets}}$	Ratio	Antao & Bonfim (2012)
Firm Size	A firm's size can be determined from its revenue and total assets which is based on the financial report or the amount of labor.	$\text{Firm Size} = \ln(\text{total assets})$	Ratio	Jaya (2020)

3.6 Data Analysis Technique

3.6.1 Descriptive Analysis

According to Ghozali (2018), descriptive statistics provide an overview or description of a data that is seen from the mean, standard deviation, maximum value, minimum value, range, kurtosis and also skewness. This study uses the mean,

standard deviation, range, maximum and minimum values as description information. The mean is obtained by adding up all the numbers which are then divided by the total data (n). Standard deviation is a measure of deviation. Range is the difference between the maximum and minimum values, where the maximum value is the data with the largest value and the minimum value is the data with the smallest value.

3.6.2 Normality Test

Normality test is a test that aims to see whether in a model has a normal distribution. The normality test was carried out using the Kolmogorov-Smirnov statistical test by first determining the test hypothesis. According to Ghozali (2018), this test is carried out by making the following hypotheses:

H0 = Data normally distributed

H1 = Data is not normally distributed

The decision-making basis for the Kolmogorov-Smirnov test is:

1. If the significance result is greater than 0.05, then the data is normally distributed and H0 is accepted
2. If the result of significance is lower than 0.05, then the data is not normally distributed and H0 is rejected

3.6.3 Classical Assumption Test

The classical assumption test is carried out to meet the basic assumptions before testing the hypothesis. Assumption test consists of multicollinearity test, autocorrelation test and heteroscedasticity test

3.6.3.1 Multicollinearity Test

According to Ghozali (2018), the multicollinearity test aims to test whether the regression model finds a correlation between the independent variables. Multicollinearity can be detected by analyzing the correlation matrix of the independent variables. Multicollinearity can be seen from the tolerance value and Variance Inflation Factor (VIF). Tolerance measures the selected independent variable which is not explained by other variables. The value that is generally used

is the tolerance value ≤ 0.10 or the same as the VIF value ≥ 10 . If this value is met, then multicollinearity occurs in the independent variable.

3.6.3.2 Autocorrelation Test

According to Ghozali (2018), the autocorrelation test tests whether in the linear regression model there is a correlation between the confounding error and the period in period t with the confounding error in the previous period. If there is a correlation, it is called an autocorrelation problem. This problem arises because the residual is not independent from one observation to another. A good regression model is a regression that is free from autocorrelation. By using the Durbin Watson test, autocorrelation problems can be detected, namely:

Table 3.4 Durbin Watson Test Criteria

H0	Decision	Statistic Criteria
There is no positive autocorrelation	Reject	$0 < d < dl$
There is no positive autocorrelation	No decision	$dl \leq d \leq du$
There is no negative autocorrelation	Reject	$4 - dl < d < 4$
There is no negative autocorrelation	No decision	$4 - du \leq d \leq 4 - dl$
There is no positive autocorrelation	Not rejected	$du < d < 4 - du$

Source: Ghozali (2018)

3.6.3.3 Heteroscedasticity Test

According to Ghozali (2018), the Heteroscedasticity Test aims to test whether in the regression model there is an inequality of variance from one observation residual to another. If the variance is constant, it is called homoscedasticity, and if it is different, it is called heteroscedasticity. A good regression model is one with homoscedasticity or no heteroscedasticity, by looking at the graph in the form of a scatterplot between the predicted value of the related (dependent) variable using ZPRED and the residual SRESID. To detect the presence or absence of heteroscedasticity, it can be done by looking at the presence or absence of certain patterns in the scatterplot between ZPRED and SRESID. If there is a certain pattern, such as dots forming a wavy pattern, widening and then narrowing, it is a sign that heteroscedasticity has occurred. If there is no clear

pattern, as well as points that spread above and below the number 0 on the Y axis, then there is no heteroscedasticity.

3.6.4 Hypothesis Test

Due to more than one dependent variable to be studied, the analysis method used is multiple linear regression. According to Ghozali (2018), regression analysis is a study of the dependence of variables that are tied to one or more explanatory variables with the aim of estimating and or predicting the population average or the average value of the dependent variable based on the known value of the independent variable. This method is to know how significant the effect of Return on Asset (ROA), Asset Tangibility and Firm Size to Leverage (Debt to Asset).

The following is the multiple linear regression equation used, namely:

$$LEV = \alpha + \beta_1 ROA + \beta_2 ATG + \beta_3 FSZE + e$$

Note:

LEV = Leverage

α = Constanta

$\beta_1, \beta_2, \beta_3, \beta_4$ = Regression coefficient of each independent variable

ROA = Return on Asset (ROA)

ATG = Asset Tangibility

FSZE = Firm Size

e = Standard Error

3.6.4.1 Coefficient of Determination (R^2)

According to Ghozali (2018), the Coefficient of Determination aims to measure how far the model's ability to explain the variation of the dependent variable. The value of the coefficient of determination is between zero and one which means that if it has a small value, then the ability of the independent variable in explaining the variation of the dependent variable is very limited, whereas if the

value of the coefficient of determination is large or close to one, then the independent variables can provide almost all information needed to predict the variation of the dependent variable. However, there is a fundamental weakness in the use of the coefficient of determination, namely the bias towards the number of independent variables included in the model. Each addition of one independent variable, the coefficient of determination increases regardless of whether the variable has a significant effect on the dependent variable, so it is recommended to use Adjusted R² to evaluate a good regression model. This value can increase or decrease if one independent variable is added to the model. If the empirical test found Adjusted R² is negative, then this value is considered to be zero.

3.6.4.2 Simultaneous Significant Test (Statistical Test F)

According to Ghozali (2018), the F statistical test is used to determine whether the independent variable simultaneously affects the dependent variable. In addition, the F test can also be used to measure the accuracy of the sample regression function in estimating the actual value. The level of significance used to make decisions is a significance value of 0.05. If the value of F (p-value) is below 0.05 then the alternative hypothesis (H_a) is accepted, which shows that all independent variables simultaneously and significantly affect the dependent variable. This test can also be done to test the feasibility of the model. Regression models can be used to predict the dependent variable if the calculated F value is greater than F table.

3.6.4.3 Individual Parameter Significant Test (T-Statistical Test)

According to Ghozali (2018), the T statistical test aims to show how far the influence of one independent variable is partially in explaining the variation of the independent variable. In the T statistical test, the significance level used to make decisions is a significance level of 0.05. In this test, if the significance value is below 0.05, then the alternative hypothesis or H_a will be accepted, which indicates that the independent variable partially affects the dependent variable significantly.