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Analysis the Effect of Fundamental Financial Ratio of CAR, LDR, LAR, Bank Size, OPE and NIM on Non-Performing Loans (NPL) of Banking Listed on the Indonesia Stock Exchange in 2012 - 2018

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Abstract:- This research aims to find out empirical evidences on the effect of Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Loan to Asset Ratio (LAR), Size Bank, Operational Efficiency Ratio (OPE), and Net Interest Margin (NIM) on Non-Performing Loans (NPL). Population of the study uses banking sector in Indonesia Stock Exchange for the period of 2012-2018. The sampling method used is purposive sampling. Forty (40) banks meet the criteria to be the sample. The method of analysis in this study is Pooled Data Regression. The model of Pooled Data used is Fixed Effect Model. The research uses secondary data of annual report ratios with 280 observations. The results of partial test show that Size Bank and OPE have positive and significant effect on Non-Performing Loans (NPL). This study also finds that CAR, LDR, LAR, and NIM do not have effect on Non-Performing Loans (NPL). The results of simultaneous test show that CAR, LDR, LAR, Size Bank, OPE, and NIM have significant effect on Non-Performing Loans (NPL).

Keywords:- *CAR, LDR, LAR, Size Bank, OPE, NIM, NPL.*

I. INTRODUCTION

The bank is one of the financial institution which have an important role in society. The function of the bank is as a financial intermediary which supports related development efforts in various fields. The role of the bank are collecting fund from the public and distributing them back to the community in credit form. The role of fundraiser is done by the bank by serving the public who want to save their money in the bank.

The banking world is one of the institution which play an important role in the economy of a nation, especially in the field of economic financing. A bank in carrying out its function requires fund to finance banking activities. It can be said as the heart of a country, especially for developing countries. The bank accepts deposits from the public (third party funds) through savings, current accounts, and deposits.

Credit disbursement, which is carried out as one of the main sources of bank revenue, is not merely going to always benefit. Credit distribution also does not rule out the possibility of experiencing a credit risk which can harm the bank. The large amount of credit granted will result in a large amount of risk by the bank concerned due to the amount of problem loans which occurs in a bank. The level of occurrence of non-performing loans is usually reflected by the ratio of Non-Performing Loans (NPL) which occurs at the bank which is used to measure the ability of bank to overcome the risk of default on loan by debtor.

The greater the amount of credit granted, the greater the risk which must be handled by the bank. Non-Performing Loans (NPL) is a ratio used to measure the ability of the bank to cover the risk of failure to repay loan by debtor. NPL reflects credit risk, the higher the level of NPL, the greater the credit risk borne by the bank (Ali, 2004). Bank always faces Non-Performing Loans (NPL) risk because its main function is as a financial intermediary. Many ways are taken by the bank to prevent NPL. Prudent credit policies, strict credit risk management, and competency development or technical training for credit managers are few examples of policies implemented by a bank to reduce NPL to a minimum.

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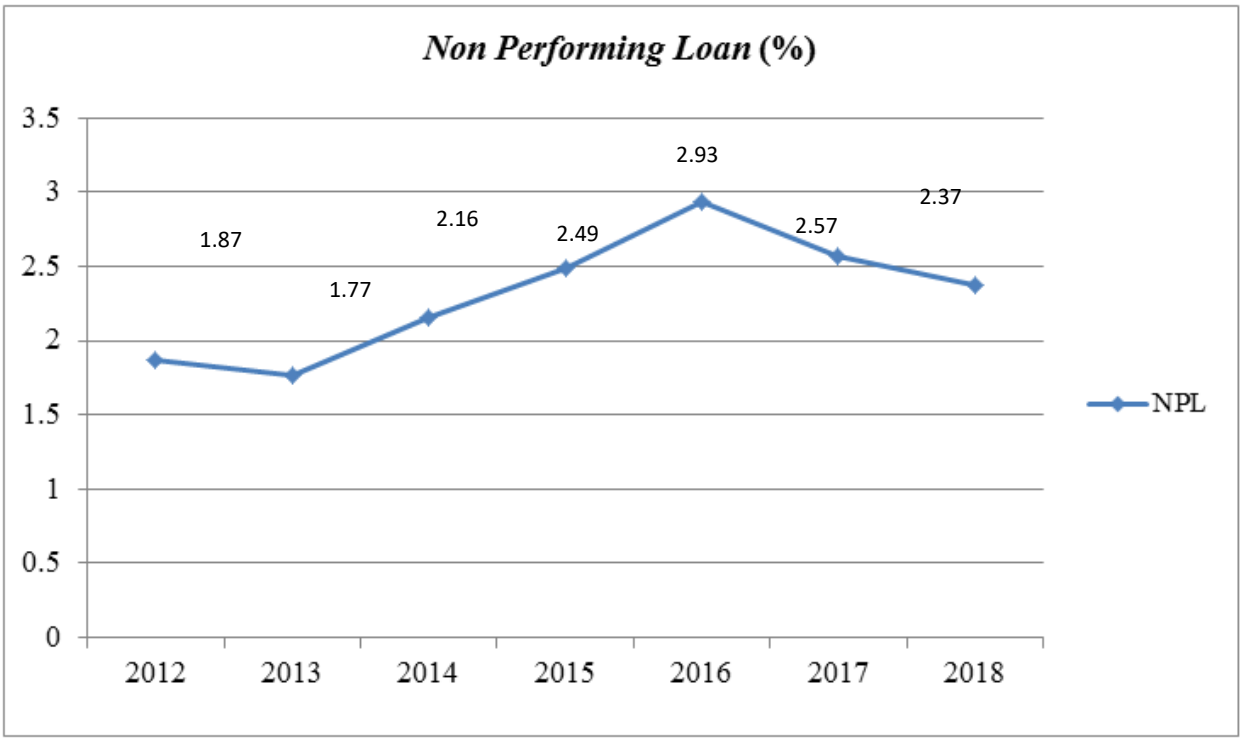

Fig 1:- Gross Non Performing Loan (%)
Source : www.ojk.go.id

Based on Fig 1. below, the initial non-performing loans is initially declined from 2012 to 2013. Then, in 2013 up to 2016 there is a steadily increased. In 2016 up to 2018 there is a significant decreased in the level of non-performing loans. Some of the variables are used to be independent variables are as follows:

VARIABLE	YEAR						
	2012	2013	2014	2015	2016	2017	2018
CAR (%)	17,43	18,13	19,57	21,39	22,93	23,43	22,97
LDR (%)	83,58	89,7	89,42	92,11	90,7	90,07	94,78
LAR (%)	63,11	66,15	65,18	65,95	64,84	64,04	65,70
Size (%)	35,95	36,10	36,22	36,31	36,40	36,50	36,58
OPE (%)	74,10	74,08	76,29	81,49	82,22	78,63	77,86
NIM (%)	5,49	4,89	4,23	5,39	5,63	5,32	3,31

Table 1:- Independent Variabel
Source: www.ojk.go.id (data is reprocessed)

Based on fig 1 and table 1 below, it can be seen in the CAR of 2012-2018 that there is a difference in trend in NPL and CAR, namely the CAR value always increase from 2012 to 2017, but decreases in 2018. Besides that, in the LDR, the LDR value of the trend is fluctuated. LAR's trend fluctuates from 2013 to 2014 decreased, then from 2014 to 2015 increased and from 2015 to 2017 decreased again and increased again in 2018. Then, Size in 2012 up to 2018 is always increased. In OPE, the trend always increased from 2013 to 2017 but from 2016 up to 2017, it is decreased. At NIM, it experiences fluctuated trends. The same thing also happens to inflation that experiences a fluctuated trend from 2013 to 2017.

$$\frac{NS + D + BD}{\text{Total Credit}}$$

II. THEORETICAL REVIEW

A. *Efficiency Theory*

Farrell (1957) has suggested that the efficiency of a company consists of 2 (two) components, namely: (1) technical efficiency and (2) allocative efficiency. Technical efficiency describes the company's ability to choose the optimal input combination at a certain price and technology level. While allocative efficiency reflects the company's ability to optimize the use of its inputs, with its price structure

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and production technology. These two measures are then combined into economic efficiency.

B. Agency Theory

Agency theory is described by Jensen and Meckling (1976). Agency problem arises because of the development of a company which is initially only as a private company then change into a public company where the ownership and management of the company are separate. This agency problem arises among interested parties with the company or can also be referred to as stakeholders. Brigham and Houston (2014: 184) explain that every investor and manager has the same information about a company's prospects. This condition is called symmetric information.

C. Non-Performing Loans

The definition of Non-Performing Loans is a condition where a customer is no longer able to pay part or all of his/her obligations to the bank as promised. (Kuncoro and Suhardjono, 2011: 420)

According to Selamet Riyadi (2006: 160) Non Performing Loan is a comparison between the amounts of credit granted with a collectivity level of 3 to 5 compared to the total loans given by bank, namely: Non-Smooth (NS), doubtful (D) and bad debt (BD).

NPL = X100%

D. Capital Adequacy Ratio

Capital Adequacy Ratio (CAR) is a ratio which shows how far all bank's assets which contain risks (loans, investments, securities, bills at other banks) are also funded from the bank's own capital funds, beside obtaining funds from sources outside the bank , such as funds from the community, loans and others (Dendawijaya, 2009: 121).

$$CAR = \frac{capital}{ATMR} \times 100\%$$

E. Loan to Deposit Ratio

Loan to Deposit Ratio is a ratio to measure the composition of the amounts of credit given is compared to the amounts of public funds and self -investment used. (Kasmir, 2012: 319)

Meanwhile, according to Dendawijaya (2001: 101), interpreting the Loan to Deposit Ratio is how far the bank's ability to refinance withdrawal of funds by depositors with relying on loans provided as a source of liquidity. The number of third-party funds raised by a bank is directly proportional to the amount of credit issued, meaning that the more third-party funds, the more credit issued.

$$LDR = \frac{\text{Credit Total}}{\text{Third Party Funds}} \times 100\%$$

F. Loan to Asset Ratio

Loan to Asset Ratio (LAR) can be used to measure the level of bank liquidity which shows the ability of bank to fill up credit demand by using total assets owned by bank. (Lukman Dendawijaya, 2009: 117)

$$LAR = \frac{\text{Total Credit}}{\text{Total Asset}} x100\%$$

G. Bank Size

Firm size is shown or valued by total assets, total sales, total profits, tax expenses and others. (Brigham & Houston, 2010: 4). According to Hartono (2008: 14) firm size is the size of a company which can be measured by the total assets/large assets of the company by using the logarithm value calculation of total assets. The size of a bank can be assessed from the total assets owned by the bank. Banks with large assets possess the possibility to generate greater profits if it is followed by the results of their activities.

Size = Ln(Total Asset)

H. Operational Efficiency Ratio (OPE)

According to Kuncoro and Suhardjono (2012: 524), Bank Indonesia is used to use OPE as a proxy for operational efficiency. It is stated that, Operational Efficiency Ratio (OPE) is the ratio of operating costs to operating income, which is a proxy for operational efficiency as commonly used by Bank Indonesia. OPE is a ratio used to measure the ability of bank management in controlling operational costs towards operating income (Hariyani, 2010: 54). The ratio of operating costs is used to measure the level of efficiency and the ability of bank to carry out its operations. Considering that the principal activities of a bank is acting as intermediaries, namely collecting and distributing funds, the costs and operating income of bank are dominated by interest costs and interest yields (Dendawijaya, 2009: 111).

$$OPE = \frac{\text{operational expenses}}{\text{Operational Income}} \times 100\%$$

I. Net Interest Margin

Net Interest Margin is a ratio used to measure the ability of bank management in managing its productive assets to generate net interest income. Net interest income is derived from interest income reduced with interest expense. The greater this ratio, it increases the interest income on productive assets managed by the bank so that the possibility of the bank in a problematic condition is smaller. (Ftrianto and Pandia, 2012: 71)

$$NIM = \frac{\text{interest income}}{\text{the average of productive assets}} X\ 100\%$$

This figure shows the relationship that occurs between CAR, LDR, LAR, Bank Size, OPE and NIM to NPL.

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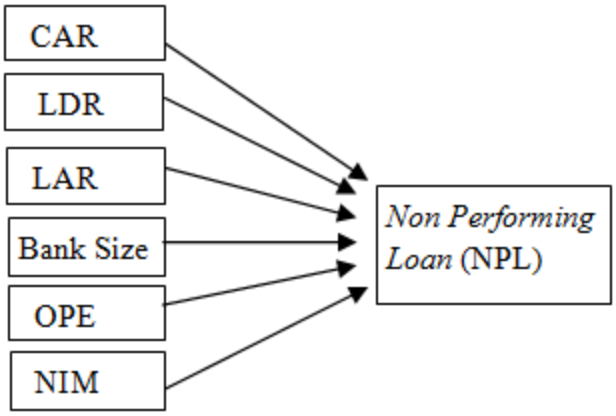

Fig 2

Based on the framework, the hypothesis on research were as follows:

H1: CAR has a significant effect on NPL
H2: LDR has a significant effect on NPL
H3: LAR has a significant effect on NPL
H4: Size has a significant effect on NPL
H5: OPE has a significant effect on NPL
H6: NIM has a significant effect on NPL

III. RESEARCH METHODOLOGY

The population in this study that is the object of research is the banking listed on the IDX and continuously publish annual reports for the period 2012 - 2018, which is a number of 44 banks. Samples that met the purposive sampling were 40 banks. Where the reporting period from 2012 - 2018 or as many as 7 years, so the number of reports is 40 x 7 reports of 280 reports. The sample can be presented as follows:

No	Creteria	Amount
1	Banking listed on IDX in 2012 - 2018	44
2	Islamic banking listed on the IDX in 2012 – 2018	(1)
3	Annual Report 2012 - 2018 not available	(3)
	Total banks as samples.	40

Table 2:- Research Sample

Data collection is collected by using secondary data by conducting content analysis Annual Report from 2012 to 2018.

In this study, independent variables used are Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Loan to Asset Ratio (LAR), Bank Size, Operational Income Operating Costs (OPE), and Net Interest Margin (NIM).

The dependent variable is variable which is affected or which is due to the independent variables. The dependent variable used in this study is the Non-Performing Loans (NPL).

Method of data analysis in this study uses panel data, which is a combination of time series data and cross section data. This study using regression analyst Panel Data with Eviews 10. With this approach, it will be known how much influence the variables Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Loan to Asset Ratio (LAR), Bank Size, Operational Income Operating Costs (OPE), and Net Interest Margin (NIM) on Non-Performing Loans (NPL) in banking listed on the Indonesia Stock Exchange (IDX). From 3 model regression panel data : Common Effect Model (CEM) , Fixed Effect Model (FEM) and Random Effect model (REM), to estimate right regression panel data model is using 2 test : Chow test and Hausman test while LM test do not need to conduct because with this 2 test above has already estimated the right model for this study.

The method describes the type or design of the study, variables and measurements, population and sampling techniques, types of data and ways of data acquisition, and data analysis techniques.

IV. RESULT AND DISCUSSION

- Descriptive Analysis

Descriptive analysis helps to get a general picture of the object of research, namely Non Performing Loans (NPL), Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Loan to Asset Ratio (LAR), Bank Size, Operational Costs Operating Expenses (OPE) and Net Interest Margin (NIM).

	NPL	CAR	LDR	LAR	SIZE	OPE	NIM
The mean	2.823429	19,541	85,08668	65.37357	30,87314	88.19864	5.275464
Median	2,395	18.31	86.18	66.76	30,685	87,225	5.1
Maximum	15.75	66.43	145.26	86.95	34.8	195.7	16.64
Minimum	0.08	8.02	42.02	37.7	26.96	8.97	0.24
Std. Dev	2.076981	6.651567	13,391	8,654388	1.910169	19,56516	2.128399
Skewness	2,091504	2.870995	-0.0766	-0.92241	0.127436	1.493931	1.37732
Kurtosis	10.63618	17.0539	5.859056	3.866605	2,092355	10.28023	7.364689
Jarque-Bera	884.4368	2688,962	95,63945	48,46765	10,3691	722,503	310.7831

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Probability	0.000000	0.000000	0.000000	0.000000	0.005602	0.000000	0.000000
Sum	790.56	5471.48	23824.27	18304.6	8644.48	24695.62	1477.13
Sum Sq. Dev	1203,565	12343.89	50029.98	20896.66	1018	106800	1263,893
Observations	280	280	280	280	280	280	280

Table 3:- Descriptive Statistics
Source : Output Eview 10 (2019)

Standard deviation as a measurement to measure the distribution of data or shows the data that fluctuates. The largest value of the standard deviation with the OPE variable is 19.56516 which means that the OPE variable has a higher level than other variables. While the NPL variable has the lowest quality level, which is 2.076981 .

This study that used panel regression data for the period 2012-2018 concluded that with $\alpha = 0.05$, which means that the display and data are normally distributed. Skewness is a measure of the asymmetric distribution of statistical data taught on average (mean). The slope of the signal through symmetrically (normal distribution) is zero. The positive slope indicates that the spread of data has a long tail on the right side (right tail length) and negative slope has a long tail on the left side (long tail left). For LDR and LAR variables, the score has a negative value, while the other variables, NPL, CAR, SIZE, OPE and NIM have positive values.

- Regression Panel Data Model

The Regression Model and Selecting of Panel Data Model, From 3 model regression panel data : Common Effect Model, Fixed Effect Model and Random Effect model:

The regression model selection is taken to choose the best panel data model. There are three tests to select the best panel data model for research data, namely: Chow Test, Hausman Test, and Langrange Multiplier. From the result of chow test a probability smaller value of α (5%), 0.0000 <0.05. Therefore FEM is the right model. From the result of Hausman test a probability smaller value of α (5%), 0.001 <0.05. Therefore FEM is the right model.

Variable	Common Effect	Fixed Effect	Random Effect
C	-25.57609 0.0004	-45.13315 0.0006	-26.5432 0.0010
CAR	-0.012032 0.5894	0.050968 0.0535	0.029523 0.1964
LDR	0.010884 0.4920	-0.008273 0.7016	0.001457 0.9346
LOG(LAR)	1.584616 0.3037	1.487079 0.4968	1.807196 0.3031
SIZE	0.122099 0.0813	0.958850 0.0020	0.199799 0.0349
LOG(OPE)	4.008994 0.0000	2.793170 0.0000	3.546389 0.0000
LOG(NIM)	-0.333331 0.2390	-0.368120 0.3939	-0.529302 0.1091
R-Square Adj R-Square	0.235558 0.218757	0.547997 0.461073	0.164709 0.146351

Table 4:-The Test Result of Data Panel Model
Source: Output Eviews 10 (2019)

Based on the test, it is chosen that Fixed Effect Model is the best data model.

Description	Coefficien	Probability	Note
Chow Test	147.127918	0.0000	FEM
Hausman Test	22.090410	0.0012	FEM

Table 5:- Test Result of Selected Panel Data Model
Source : Data Eviews 10 (2019)

The Chosen best model in this research is the Fixed Effect Model with the following result output.

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Description	Coefficient	t-statistics	Prob
C	-45.13315	-3.459683	0.0006
CAR	0.050968	1.940455	0.0535
LDR	-0.008273	-0.383602	0.7016
LOG(LAR)	1.487079	0.680573	0.4968
SIZE	0.958850	3.128021	0.0020
LOG(OPE)	2.793170	4.871650	0.0000
LOG(NIM)	-0.368120	-0.854097	0.3939
R-squared	0.547997		
Adjusted R-squared	0.461073		
F-statistics	6.304348		
Prob(F-statistik)	0.000000		

Table 6:- The Result Fixed Effect Model
Source : Output Eview 10 (2019)

By choosing the Fixed Effect Model, than a panel data regression equation is formed that can be formulated as follows:

$$NPL_{it} = -45.13315 + 0.050968\ CAR_{it} - 0.008273\ LDR_{it} + 1.487079\ LOG(LAR)_{it} + 0.958850\ SIZE_{it} + 2.793170\ LOG(OPE)_{it} - 0.368120\ LOG(NIM)_{it} + \epsilon_{it}$$

➢ *Determination Coefficient (R^2)*

R-Squared (R2) values is 0.547997. It means that the variation in dependent variable of Firm Value can be explained by the variation of the independent variables 54.79%, while the remaining 45.21% is explained by other factors outside from this research's.

➢ *F Test*

Based on the data in the table F-test, it can be seen that the probability (p-value) is equal to 0.0000. This value is smaller than 5%, so it can be concluded that a confidence level of 95% ($\alpha = 5\%$) H0 can be rejected. This means independent variables CAR, LDR, LAR, SIZE, OPE and NIM affect on Non -Performing Loans (NPL) simultaneity.

➢ *Test t*

The t test (partial test) is conducted to show how far each effects independent variables CAR, LDR, LAR, SIZE, OPE and NIM individually or partially influence or explain dependent variable NPL (Non -Performing Loans)

The effect of Capital Adequacy Ratio (CAR) on Non-Performing Loans (NPL): CAR probability of 0.0535 is greater than 0.05, so this variable is on area of H0 acceptance. It means that CAR has no significant effect on NPL of the banking listed in the Indonesia Stock Exchange from 2012 to 2018. This research's result can be correlated with agency theory that the management can maximize the value of company equity, company size, profitability and minimize risk to the invested capital through increasing CAR. CAR provisions of at least 8% were used by Bank Indonesia that stipulates the Bank's Minimum Capital Requirements in Bank Indonesia Number 14/18 / PBI / 2012 about Minimum Capital Requirements for Commercial Banks. Banks with high CAR value seem that they are able to handle the potential risk of losses caused by bank activity such as non-performing loans. The result of this study is related with research by Ali Shingjergji (2013) and Kilugala Malimi (2017) stating that the CAR has no significant effect on NPL.

The effect of Loan to Deposit Ratio (LDR) on Non-Performing Loans: LDR probability of 0.7016 is greater than 0.05, so this variable is on area of H0 acceptance. It means that the LDR has no significant effect on NPL of the banking listed in the Indonesia Stock Exchange from 2012 to 2018. According to Bank Indonesia, the lower limit of a bank's LDR is around 78%. But the upper limit of the LDR is 92%. It can be concluded that the LDR explains how far the banks capability to balance the amount of lending to customers with the amount of third-party funds. Loan to Deposit Ratio describes how far the bank's capability to refinance the withdrawals fund by depositors with relying on loans provided as a liquidity source. In this theory, it is explained that the ability of banks to repay obligations to customer who has invested fund by relying on loans provided as a liquidity source. The result of this study is in line with research by Daisy Firmansari (2015), Deasy Dwihandayani (2017) and Vasiliki Makri, Athanasios Tsagkanos & Athanasios Bellas (2013) who state that the LDR has no significant effect on NPL.

The Effect of Loan to Asset Ratio (LAR) on Non-Performing Loans: LAR probability of 0.4968 is greater than 0.05 so this variable is on area of H0 acceptance. It means that LAR has no significant effect on NPL of the banking listed in the Indonesia Stock Exchange in 2012 – 2018. Loan to Asset Ratio (LAR) is a comparison the amount of credit given by bank to the amount of total assets owned by bank. This ratio measures the level of bank's liquidity. Loan to Asset Ratio can be used to measure the bank's liquidity level. It can show the ability to fulfil the credit demand using the total assets owned by bank. The result of this study is in line with the research of Septiono Budi Santosa, Sudarto & Bambang Sunarko (2013), Deasy Dwihandayani (2017) and Carolina and Madyan (2015) stating that the LAR has no significant effect on NPL.

The Effect of SIZE on Non-Performing Loans: Size probability of 0.0020 is smaller than 0.05 so that this variable is on the rejection area of H0. It means that Size has a significant positive effect on NPL of the banking listed in the Indonesia Stock Exchange in 2012 – 2018. Banking size describes the size of a bank. Determination of large or small scale can be determined based on total assets. Moreover, the risk is the greater lending of the bank. This loan distribution does not effect in problem loans if the composition of fund is sufficient. If the bank's assets do not managed and used optimally for the bank's operational activities, the bank will have potential to spend greater asset management costs. The result of this study is in line with research by Andreas (2016)

and Barus & Erick (2016) who state that Size has a significant positive effect on NPL.

The Effect of Operational Efficiency Ratio (OPE) on Non-Performing Loans: OPE probability of 0.0000 is less than 0.05, so this variable is on the rejection area of H0. It means that OPE has a significant positive effect on NPL of banking listed in the Indonesia Stock Exchange from 2012 to 2018. Operational Efficiency Ratio is the ratio that compares operating expenses with operating income, with the aim to find out how much the banks ability to manage operating expenses so as not to well. In banking OPE also has big influence in measuring the level of efficiency and also the ability of banks to run their operational activities. The banking institution that have efficiency, especially cost efficiency will obtain maximal profit level, additional funds are distributed, more competitive costs, improvement of customer services, increasing the security and health banking. Moreover, it can be obtained by good cost efficiency. The result of this study is in line with the research of Iqbal (2014) and Prizes (2018) who state that the Operational Efficiency Ratio (OPE) has a significant positive effect on NPL.

The Effect of Net Interest Margin (NIM) on Non-Performing Loans: NIM probability of 0.3939 is greater than 0.05, so that this variable is in the area of H0 acceptance. It means that the NIM has no significant effect on NPL of the banking listed in the Indonesia Stock Exchange from 2012 to 2018. Net Interest Margin is a ratio that used to analyze how much net interest income is compared to a banks productive assets. Based on the theory of performance, the greater ratio will increase interest income on earning assets managed by banks and problematic conditions will be smaller. This ratio is very necessary in the management of banks properly, so that the banks experiencing problems can be minimized. Thus, the risks that often cause problems in banks can be avoided. However, good management in each of the banks operational activities is indeed very much needed so that the banks can be in accordance with safer. The result of this study is in line with research by Radivojevic (2012) and Dahlia Wati (2017) stating that the NIM has no significant effect on NPL.

V. CONCLUSION

The conclusions obtained from the results of this research and discussion are:

- CAR has no significant effect on NPL of banking listed on the IDX in 2012 - 2018.
- LDR has no significant effect on NPL of banking listed on the IDX in 2012 - 2018.
- LAR has no significant effect on NPL of banking listed on the IDX in 2012 - 2018.
- Size has a positive and significant effect on NPL of banking listed on the IDX in 2012 - 2018.
- OPE has a positive and significant effect on NPL of banking listed on the IDX in 2012 - 2018.
- NIM has no significant effect on NPL of banking listed on the IDX in 2012 - 2018.

Based on the results of the discussion and conclusion, the author tries to convey some suggestions for consideration as follows:

- For investors who want to invest in banking companies are advised to choose company with complete disclosure of information both business risk information, corporate governance and company sustainability information.
- The company should pay attention to the right funding source to run the business, both the capital costs and risks. So those things can minimize the possibility of risk that can hamper the process of investment growth and optimize corporate profits.
- Next, researchers can use longer study periods and more samples to get more valid results.

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