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Capital, Bank Size, Credit Risk and Bank Performance

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Abstract:- The purpose of this study is to obtain empirical evidence of the effect of capital, bank size on credit risk and bank performance. The sample using the bank that publishes financial statements in full during the years 2010-2017 and falls into the category of Group of Business Activities (BUKU) 3 and 4 related to business activities and office networks based on the core capital of banks in Indonesia. Data analysis techniques in this study are path analysis. The results show that capital does not have a significant effect on credit risk, Bank size is proven to have a positive and significant influence on credit risk. Capital, bank size proved to have a positive and significant influence on bank performance. Credit risk is proven to have a negative and significant influence on bank performance. Capital has proven to have an indirect positive influence on bank performance through credit risk. while bank size does not have an indirect influence on bank performance that is significant through credit risk.

Keywords:- *Capital, Size Banks, Credit Risk, Bank Performance.*

I. INTRODUCTION

Banks play an important role in the economy, sound banking is a requirement for sustainable economic development. The Banking Sector performs important economic functions in providing financial intermediation and economic acceleration by converting public funds in the form of deposits into productive assets such as loans needed for economic activities (Menicucci & Paolucci, 2016). From this important role, banks are required to have good performance.

A measure to assess the financial performance of a bank is one of them by looking at the level of profitability. The main objective of bank activities is to achieve maximum levels of profitability (Vernanda & Widyarti, 2016). Profitability is a bank's expertise to generate or earn profits effectively and efficiently. If you want to achieve an efficient financial system, financial institutions must record increased profitability, increase the volume of funds flowing from depositors to borrowers, and better quality services for customers. The importance of bank profitability in the economy can be assessed both micro and macro. (Menicucci & Paolucci, 2016).

This study calculates profitability with a Return on Asset (ROA) ratio. According to. Menurut (Margaretha, 2006), (Nurul Fatimah Rofiatun, 2016) ROA has a very important role in the financial performance of a company or banking. The good and bad condition of a company can be seen quickly through ROA position, if the value of ROA is large enough, the it will have an impact on the bank's profits that are getting bigger and the better the position of the bank in terms of asset use. Based on Bank Indonesia Circular Letter in 2004, good ROA is worth more than 1.25%.

There are several factors that can affect bank profitability, these factors consist of internal factors and external factors beyond the control of the company or bank. Some previous studies found that the factors that determine the bank's profitability are regulatory capital, bank size, and non-performing loans. Previous research entitled The determinants of bank profitability: empirical evidence from the European banking sector. The findings revealed that the size and capital ratio of the significant company-level determinants of bank profitability in Europe. (Menicucci & Paolucci, 2016). Furthermore, research (Ntow & Alu, 2016) found that problem loans had a negative effect on bank ROA and ROE. The research also found that banks with large capital took more credit risk in the form of non-performing loans while an increase in bank size led to low non-performing loans. Furthermore, inflation and industrial concentration are not significant in determining non-performing loans.

Another study from (Adelopo, Lloydking, & Tauringana, 2018) who examined the relationship between bank-specific, macroeconomic factors and bank profitability before (1999-2006), during (2007-2009), and after (2010-2013) financial crisis. The results showed that there was a significant relationship between bank-specific determinants (size, cost management, and liquidity) and bank profitability (ROA) before, during, and after the financial crisis. However, the relationship between other bank-specific determinants (capital strength, credit risk, and market

strength), macroeconomics (gross domestic product and inflation) is sensitive to both analysis periods (before, during, and after the financial crisis) and bank profitability.

Research conducted by (Tran, Lin, & Nguyen, 2016) This study examines the reciprocal relationship between liquidity creation, regulatory capital, and profitability of US bank banks. The findings of the study indicate that regulatory capital and the creation of liquidity positively influence each other after controlling the bank's profitability. However, this relationship was largely driven by small banks and especially during the non-crisis period. This is also sensitive to the capital level of bank regulations and how they are measured. In addition, we find that banks that create more liquidity and show higher liquidity risk have lower profitability. Finally, the relationship between regulatory capital and bank performance is not linear and depends on the level of capitalization. Regulatory capital is negatively related to bank profitability for banks with high capital but is positively related to profitability for banks with lower capital. Therefore, changes in regulatory capital have a different impact on bank performance.

Research (Putrianingsih & Yulianto, 2011) found that NPL negatively affected profitability. CAR has a negative effect on profitability. Research (Vernanda & Widyarti, 2016) Variable Capital Adequacy Ratio (CAR) has a significant positive effect on ROA. BOPO has a significant negative effect on ROA. Loan to Deposit Ratio (LDR), NPL, Bank size does not significantly influence ROA. The results of the study (Ambarawati & Abundanti, 2018) show that the CAR has a positive and significant effect on ROA. NPL have a negative and significant effect on ROA. The LDR has a positive and significant effect on ROA.

Profit is an important prerequisite of competitive banking institutions. This is not only a result but also a requirement for a successful business in a period of increasing competition in financial markets. Therefore, the basic goal of bank management is to realize profits, as a critical condition for running any business. The existence, growth, and survival of business organizations largely depends on the benefits that can be obtained. At the macro level, the profitable banking sector is better able to deal with negative shocks and contribute to financial system stability. Given the relationship between the health of the banking sector and economic growth (G. Rajan & Luigi, 1995), the study of the performance of the banking sector is very prominent in developed countries. Thus, an understanding of the determinants of bank profitability is very important and important for economic stability because the welfare of the banking sector is very important for economic welfare in general. (Menicucci & Paolucci, 2016)

Based on the above background, the formulation of the problem in this research is whether capital, bank size affects credit risk and bank performance. The purpose of this study is to obtain empirical evidence of the effect of capital, bank size on credit risk and bank performance.

II. LITERATURE REVIEW AND "HYPOTHESES" DEVELOPMENT

A. Theory of Economies of Scale

Economics scale in economics refers to the cost advantages associated with business expansion. According to Gozali (2009) (Vernanda & Widyarti, 2016) economies of scale point to the low-cost benefits derived from the expansion of operational activities in a company and are one way to achieve low-cost advantages in order to create competitive advantage. Economies of scale can be obtained from the development process and work efficiency in operational activities in all departments in the company. In addition, companies with a variety of sizes can enjoy economies of scale benefits during the scale of production is increased.

B. The Bad Luck Hypothesis, the Bad Management Hypothesis, and the Moral Hazard Hypothesis

This section provides an overview of some research on determinants of problem loans and bank profitability. (Berger & Deyoung, 1997) in their paper, they have found formulas that have been tested in causal relationships in relation to credit quality, cost efficiency, and banking capital. Their hypothesis is often used as a basis for assumptions by other researchers such as (Klein, 2014), (Ghosh, 2015) dan (Gunawan. & Sudaryanto, 2016) The formula is based on the following hypotheses.

The bad luck hypothesis explains that the increase in Non-Performing Loans can be influenced by external factors that cannot be controlled by bank management, such as the global condition of the economy. When a loan has expired, the bank must pay additional costs to deal with the problem. These costs include (1) additional supervision costs for troubled borrowers and collateral value, (2) cost of analyzing and negotiating agreements, (3) costs for maintaining and selling collateral when there is a default, (4) additional costs to maintain records the soundness of the bank to the banking and market supervisor, and (5) the distraction of senior management's attention to solving other operational problems.

The bad management hypothesis explains that low-cost efficiency can signal a bad bank management practice. The assessment is based on the behavior of the management of a substandard loan portfolio. Bank management may not practice adequately regarding loan underwriting, monitoring, and controlling. As bad management, there are certainly many weaknesses such as (1) skills that are low in credit scoring and only see high loans without seeing that there is a negative present value, (2) low competency in overseeing loans such as valuing collateral against loans, and (3) having difficulty monitoring and controlling the debtor. In contrast to reducing costs in direct efficiency, underwriting and poor credit monitoring will cause a high number of problem loans only after some time has passed.

The moral hazard hypothesis is a classic problem of excessive risk-taking when the other party participates in risk but the party cannot easily take the risk. Based on this

hypothesis, banks with relatively low capital will increase the risk level of credit portfolios, which will result in higher non-performing loans in the future. Although this hypothesis does not directly describe the relationship between efficiency costs and loan problems, (Berger & Deyoung, 1997) consider this moral hazard problem important. The reason is (1) moral hazard provides an alternative explanation for bad credit, that the effect of cost-efficiency measured on non-performing loans can be biased if the potential effect of capital is ignored. (2) The effect of moral hazard can increase the effect of the other 3 hypotheses and the hypothesis can be the main problem of reduced capital and moral hazard incentives.

C. Effect of Capital on Credit Risk

Capital variables that indicate the capacity of banks (assets and capital) in carrying out operational activities including credit activities. The proxy used is the Capital Adequacy Ratio (CAR). CAR is a ratio that shows how far all risk-bearing bank assets (credit, participation, securities, bills on other banks) are also financed from the bank's own capital funds in addition to obtaining funds from sources outside the bank, such as funds from the public, loans, and others (Dendawijaya, 2003). From this understanding means that the bank's own capital is used to finance assets that contain risks. The higher the capital owned by the bank, the easier it will be for banks to finance assets that contain risk. Likewise, if credit is not accompanied by sufficient capital, it will potentially lead to non-performing loans so it can be concluded that the higher the CAR will be able to reduce credit risk faced by banks (Gunawan. & Sudaryanto, 2016). According to the moral hazard hypothesis, low capital encourages companies to engage in risky lending practices which generally contain credit scoring and poor monitoring (Berger & Deyoung, 1997). So that low capital can interfere with activities, especially in determining the standards of prospective debtors who are eligible to receive credit loans. This is in accordance with the results of the research that has been done (Ntow & Alu, 2016) and (Gunawan. & Sudaryanto, 2016).

- Hypothesis 1: Capital (CAR) has a negative effect on NPL

D. Bank Size Influence on Credit Risk

The variable size in this study uses the proxy of total assets more precisely the natural logarithm (ln) of total assets. This is because the amount of the total assets of each bank is different and has a far different. Banks with large assets are indeed able to generate large profits if they are balanced with good operational activities. One of the banking operational activities is to provide credit to the community. Large banks generally channel large loans as well. This can increase the potential for problem loans if the supervision is not done properly. The moral hazard hypothesis (Berger & Deyoung, 1997) can explain that banks that have large assets tend to be more courageous to take risks by channeling large amounts of credit and tend to be used by inappropriate debtors. The reason is that the impact of market discipline cannot be imposed on banks that expect government protection in the event of default (Stern dan Fieldman, 2004). The impact of large banks can increase the drive to increase the amount of credit channeled and this tends to be used by low-quality debtors. This is in line with research (Misra & Dhal, 2014) which also found that banks with high asset ownership were more likely to have a high Non-Performing Loan rate. This is because small banks are considered capable of showing better managerial efficiency than large banks, especially in loan screening and monitoring, which can indicate credit risk. Furthermore, this is also in line with research (Barus & Erick, 2016) and (Gunawan. & Sudaryanto, 2016) who find that bank size has a positive and significant effect on NPL.

- Hypothesis 2: Bank size has a positive influence on NPL

E. Effect of Capital on Return on Assets (ROA)

CAR ratio is used as a benchmark for a bank's ability to cover losses caused by risky assets. CAR has a relationship with profitability because CAR is a ratio to calculate how much bank capital is sufficient to support its needs. The greater the CAR indicates the ability of banks to obtain good profits. So CAR has a positive effect on earnings and can increase ROA (Vernanda & Widyarti, 2016) the results of the research (Menicucci & Paolucci, 2016) found that capital ratio is one determinant of the level of profitability of banks in Europe. This is in line with the research (Ambarawati & Abundanti, 2018) and (Tran et al., 2016) which found that Capital has a positive and significant effect on ROA.

- Hypothesis 3: Capital (CAR) has a positive influence on the bank performance (ROA)

F. Bank Size Effect on Return on Assets (ROA)

In general, large companies that have large total assets are able to generate large profits. Larger banks measure assets more favorably than banks with small asset sizes, because larger bank sizes have a higher level of efficiency (Kosmidou & Zopounidis, 2008). With large assets owned by banks, banks can have more productive assets than banks with smaller assets. The results of research (Menicucci & Paolucci, 2016) find that bank size is one of the determinants of the level of profitability of banks in Europe. This is in line with the research (Adelopo et al., 2018), which found that the bank size has a positive effect on ROA

- Hypothesis 4: Bank size has a positive influence on the bank performance (ROA)

G. Effect of Non-Performing Loans on ROA

NPL is one of the financial ratios that reflects credit risk. Credit risk is a risk due to failure or inability of the customer to return the amount of the loan received from the bank and its interest according to a predetermined or scheduled time period (Siamat, 2004). The greater the NPL, the greater the risk of credit failure channeled and the potential to reduce interest income and reduce profits. If the profit generated falls, it will reduce ROA (Vernanda & Widyarti, 2016). A high level of NPL can cause a banking crisis to make banks bankrupt which has a negative impact on economic growth. (Barr, Seiford, & Siems, 1994). NPL

cause uncertainty that results in lower lending by banks which ultimately affects aggregate demand and investment (Umar & Sun, 2015). Furthermore, research (Ntow & Alu, 2016) found that NPL negatively affected bank ROA and ROE. This is in line with research (Putrianingsih & Yulianto, 2011) found that NPL had a negative effect on bank profitability (ROA)

- Hypothesis 5: NPL has a negative influence on the bank performance (ROA)

H. The effect of Capital on Return on Assets (ROA) through the NPL

CAR is an indicator of the ability of banks to cover their decline in assets as a result of bank losses caused by risky assets one of the problematic (NPL). These risky assets tend to limit the amount of capital available in profit-generating activities. The higher the CAR, the stronger the bank's ability to bear risky earning assets, in this case, NPL, so that it can make bank profitability increase (Vernanda & Widyarti, 2016). This shows that CAR can cover the credit risk that will be faced by the bank so that the bank's profits are maintained.

- Hypothesis 6: CAR has an indirect influence on ROA through NPLs

I. The effect of Capital on Return on Assets (ROA) through the NPL

Large total assets can indeed increase the volume of loans provided, but from there credit risk can also increase. In order to suppress NPL, banks are required to be better at exploring debtor information. Banks with a large size (total assets) should be able to create and innovate products by utilizing the size of assets to attract the attention of small banks such as collateral debt.(Gunawan. & Sudaryanto, 2016). This shows that when banks have large assets it is possible to obtain large profits by making appropriate arrangements for the loans channeled so as to minimize the occurrence of credit risk.

- Hypothesis 7: Bank size has an indirect influence on ROA through NPL.

Based on the description above, the conceptual framework model in this study can be formed as follows:

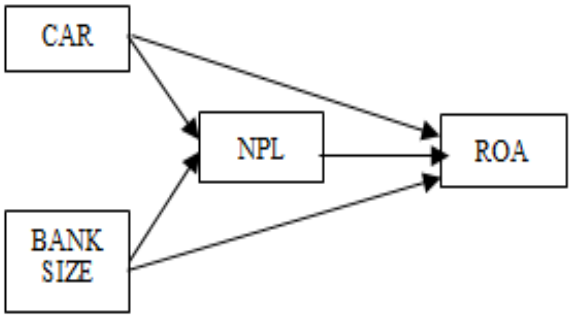

Fig 1:- Conceptual Framework

III. METHODOLOGY

A. Population and Sample

The Population is the total number of groups of individuals or the overall object of research. The population in this study are all banks operating in Indonesia. The sample is part of the population that will be studied and is considered capable of representing the population.

The sampling technique in this study used a purposive sampling technique, which is sampling with certain considerations and criteria in accordance with the objectives of the study. Banks that will be used as research samples are banks that have the following criteria:

- Conventional Commercial Banks
- Bank categories of Business Activities 3 and 4 based on Financial Services Authority Regulation Number 6 / POJK.03/2016 concerning business activities and office networks based on bank core capital. BUKU 3 is a Bank with a minimum Core Capital of IDR 5,000,000,000,000.00 up to less than IDR 30,000,000,000,000.00 and BUKU 4 is a Bank with a minimum Core Capital of IDR 30,000,000,000,000.00 (Otoritas Jasa Keuangan, 2016)
- Banks publish financial statements in full during 2010-2017
- Have complete data in accordance with the variables studied in this study. Based on the sampling criteria above, the banks that meet the requirements for use as samples in this study are 25 banks from 2010-2017.

B. Types and Sources of Data The

Types of data used in this research are documentary data in the form of bank financial statements of the Group of Business Activities (BUKU) 3 and 4 in Indonesia for the period 2010-2017. While the data sources used in this study are secondary data in the form of figures in annual financial reports obtained from the Financial Services Authority (OJK), Bank Indonesia (BI) or from their respective Banks.

C. Operational Definition of Variables

Definition of the variable aims to explain the meaning of the variable being studied, while the operational definition of the research variable is described in Table 1 as follows:

No.	Variable	Definition	Measurement
1	Capital Adequacy Ratio (CAR) (X1)	Ratio for measuring bank capital adequacy in accordance with BI standards Bank	$CAR = \frac{\text{Bank Capital}}{\text{ATMR}}$
2	Bank Size (X2)	Number of assets owned by bank Log Total Asset	Log Total Asset
3	Non Performing Loan (Y1)	The ratio of total non-performing loans to total loans channeled by banks	$NPL = \frac{\text{Problematic loans}}{\text{Total Kredit}}$
4	*Return on Asset* (Y2)	Ratio used to measure bank profitability	$ROA = \frac{\text{Earning After Tax}}{\text{Total Assets}}$

Table 1:- Operational Definition of Variables

D. Data Analysis Techniques

By referring to the conceptual framework stated earlier, the method chosen for data analysis in this study is path analysis with the help of AMOS (Analysis of Moment Structure) software.

IV. RESULTS AND DISCUSSION

Early research used 25 bank samples to form 200 data. However, in data processing, there are several data outliers that disrupt the normality of the data so that the data outliers are removed. So that the amount of observation data in this study becomes 180 data. Outlier data is data that has a unique value that is very different than other data. The unique data is in the form of extreme values both in the form of single variables and combination variables. Outlier data can cause bias in research, especially in the data normality test (Gunawan. & Sudaryanto, 2016), (Ghozali, 2013)

	N	Min	Max	Mean	Std. Deviation
CAR	180	10,25	30,00	18,1768	3,79988
Size	180	6,72	9,03	7,9650	,45874
NPL	180	,08	5,65	2,1281	1,21464
ROA	180	,11	5,15	2,4120	1,07897
Valid N (listwise)	180				

Table 2:- Descriptive Statistics Research Variables
Source: SPSS Output

This study requires the fulfillment of normality assumptions where distribution can be said to be normal if CR skewness and CR kurtosis are smaller than the critical value table ± 2.58 with a significance level of 0.05 (P-Value 5%),(Ghozali, 2013). After the outlier data is removed, the normality test of the data in this study can be seen in the following table:

Variable	min	max	skew	c.r.	kurtosis	c.r.
X2	6,723	9,032	,465	2,548	-,247	-,676
X1	10,252	30,000	,561	3,071	-,152	-,417
Y1	,080	5,646	,292	1,600	-,560	-1,534
Y2	,110	5,150	,362	1,980	-,233	-,637
Multivariate					-1,367	-1,323

Table 3:- Assessment of Normality
Source: AMOS Output

Univariate analysis in table 3 above, it is known that there are still variables that have a variable value that has a CR value greater than ± 2.58 which is 3.071. Thus it can be seen that univariate data distribution is abnormal at the 0.05 significance level. But if the test is analyzed multivariate, it is known that CR kurtosis of -1,323 is smaller than the critical value of the table ± 2.58. so that it can be concluded that multivariate data distribution is normal..

If multivariate testing is normal then univariate is also normal. While testing all univariate variables is not normal does not guarantee that multivariate testing is also not normal (Kline, 2011) Thus it can be concluded that the data in this study are normally distributed, because even though not normally distributed univariate but normally distributed multivariate, therefore assumptions normality in this research has been fulfilled.

Data Normality Test with Determinant of Sample Covariance Matrix, which is to see whether there are multicollinearity and singularity in a combination of variables. Really small determinants indicate the presence of multicollinearity or singularity. It is hoped that the Determinant of Sample Covariance Matrix will avoid ZERO and better if> 1. The results show the Determinant of Sample Covariance Matrix 3.299 thus the assumption of multicollinearity in this study has been fulfilled.

Based on path analysis, the following presented the standardized structural equation of the study path coefficient

Variable	Direction Hypothesis	Coef. Estimate	S.E	P	Accepted/ Rejected
X1 → Y1	-	-0,065	0,023	0,375	Rejected
X2 → Y1	+	0,170	0,195	0,020	Accepted
X1 → Y2	+	0,269	0,017	0,000	Accepted
X2 → Y2	+	0,441	0.146	0,000	Accepted
Y1 → Y2	-	-0,327	0,055	0,000	Accepted

Table 4:- Standardized Coefficients
Source: Processed Data (2019)

The estimated results of the standardized coefficients in Table 4 above show the following conditions:

- CAR (X1) has a negative and significant effect on NPL (Y1). This indicates that an increase in the Capital Adequacy Ratio (CAR) at a bank will be able to reduce the credit risk (NPL) of the bank.
- Bank size (X2) has a positive and not significant effect on NPL (Y1). This shows that the increase in size or assets owned by the bank will also increase the credit risk (NPL) that the bank will face even though it is not significant.
- CAR (X1) has a positive and not significant effect on ROA (Y2). This indicates that an increase in the Capital Adequacy Ratio (CAR) at a bank will be able to increase profitability at the bank, although not significantly.
- Bank size (X2) has a positive and significant effect on ROA (Y2). This confirms that with increasing size or assets owned by the bank, it will also increase the bank's profitability.
- NPL (Y1) has a negative and significant effect on profitability (Y2). this test confirms that banks with increasing non-performing loans owned by banks will reduce the profitability of a bank

A. Direct Effect Calculation

Direct effect of research variables in this study can be seen in Table 5 below

Combination of Variable	Direct Effect (Coefficient, Estimation)
CAR (X1) → NPL (Y1)	-0,065
Bank Size (X2) → NPL (Y1)	0,170
CAR (X1) → ROA (Y2)	0,269
Bank Size (X2) → ROA (Y2)	0,441
NPL (Y1) → ROA (Y2)	-0,327

Table 5:- Direct Effect Variables of Research
Source: Processed Data (2019)

Based on the calculation of the direct effect on table 5 taken on the coefficient Standardized regression estimates have two paths that show negative value weights, one of which is -0,327, which illustrates that non-performing loans owned by banks will reduce the profitability of the bank.

B. Indirect Effect Calculation

The calculation of indirect effects is done by multiplying the value of each variable, which can be seen in Table 6 below.

Combination of Variable	Coefficient direct effect To Y1 x Coefficient direct effect To Y1 To Y2	Coef. Indirect Effect
X1 → Y2 *Via* Y1	-0,065 x -0,327	0,021
X2 → Y2 *Via* Y1	0,170 x -0,327	-0,056

Table 6:- Indirect Effects of Research Variable
Source: Processed Data (2019)

Based on the results of calculations in table 6, the results of the combination of CAR CAR ROA via NPL have a weight value of 0.021. This shows that bank capital adequacy has a positive relationship and tends to increase bank profitability through a decrease in NPL.

Furthermore, the combination of Bank size ROA via NPL has a weighting value of -0.056. This shows that the number of bank assets or bank size has a negative relationship and tends to reduce bank profitability through the level of NPL.

C. Calculation of the Total Effect

Calculation of the total effect by summing the values of each variable, as can be seen in Table 7 below:

Combination of Variable	Coefficient direct effect To Y1 + Coefficient indirect effect To Y1 To Y2	Coef. Total Effect
X1 → Y2 *Via* Y1	0,269 + 0,021	0,291
X2 → Y2 *Via* Y1	0,441 + -0,056	0,385

Table 7:- Total Effect Research Variable
Source: Processed Data (2019)

Based on the calculation of the total effect in table 7, the effect of capital (CAR) on profitability via NPL credit risk has a weight of 0.291. These results indicate that the CAR variable has a positive influence on bank profitability. This can happen because with the achievement of a minimum CAR in accordance with the bank's standards, it

will be able to anticipate risks and increase the bank's profitability.

D. Calculation of Significance Value of Mediation Influence (Sobel Test)

To test the significance values mediation variable, besides using the Sobel test can also be done with Hayes, OLS, and Preacher. In research using AMOS software tools that cannot directly test the role of mediation, mediation testing in variables in the study can be done using the Sobel test. The calculation of the significant value of the mediation effect in this study is carried out by a Sobel test which aims to obtain the significance value of the role of the intermediary variable in a model. The significance value of the role of the intermediation variable is obtained by calculating the value of estimation and standard error (SE), Sobel, (1982), (Tangke P, 2018)

Table 8 below is the calculation of the role of the intermediary variable of this research model.

Combination of Variable	**Value Estimated**	**Standar *Error***	**P *Value of* Sobel *Test***
X1 → Y2 *Via* Y1	-0,065 ; -0,327	0,023 ; 0,055	0.00534
X2 → Y2 *Via* Y1	0,170 ; -0,327	0,195 ; 0,055	0.19418

Table 8:- Total Effect Research Variable
Source: Calculation with the help of the statistical calculator program version 3.1 Beta (2019) (2019), https://www.danielsoper.com/statcalc/calculator.aspx?id=31

Based on the results of a single test calculation in Table 8 above, it can be explained that CAR has a significant indirect effect on bank profitability through NPL with the value of a small P-Value test of 0.005 <alpha 0.05. Furthermore, the bank size indirect and not significant influence on bank profitability through NPL with the value of the P-value of the double test is 0.194> alpha 0.05.

E. Hypothesis Testing Hypothesis

Testing is done by comparing the p-value with a significance level (alpha) of 0.05. If p-value <alpha 0.05 then H0 is rejected and H1 is accepted. Conversely, if p-value> alpha 0.05, then H0 is accepted and H1 is rejected. The results of hypothesis testing in this study are:

➢ *Hypothesis Testing 1*

Based on the results of path analysis in table 5 above, the beta standardized coefficient value directly influences CAR (X1) on NPL (Y1) of -0.065 with a probability of 0.375> alpha 0.05. This shows that CAR has a negative and not significant effect on NPL. Thus the H1 Hypothesis which states that CAR has a direct influence on the bank's NPL is rejected.

It can be seen in table 3 the mean value of capital is 18.1768%. This shows that CAR in the Bank Group of Business Activities or books 3 and 4 has met the CAR standard set by Bank Indonesia at 8%. A high CAR value indicates that the bank has good ability in anticipating actions against the risk of losses, especially credit risk. However, the increase in capital is not entirely allocated to loans or to cover credit risks that have occurred, but policies for investment. This has a large impact on non-performing loans which will still cause losses. These results are in accordance with the research (Barus & Erick, 2016) and (Gunawan. & Sudaryanto, 2016) who find CAR has a negative effect but not significant to NPL.

➢ *Hypothesis Testing 2*

Based on the results of the path analysis in table 5 above, the beta standardized coefficient value of the direct effect of bank size (X2) on NPL (Y1) is 0.170 with a probability of 0.020 <alpha 0.05. This indicates that bank size has a positive and significant direct influence on NPL. Thus Hypothesis H2 which states that bank size has a direct influence on bank NPLs is accepted.

The results of this study are in line with research (Misra & Dhal, 2014), (Ghosh, 2015) dan (Gunawan. & Sudaryanto, 2016) which states that the higher the size of the bank, the condition of the bank is also more prone to problems of bad credit. Size is also influenced by bank leverage. Large assets have a tendency to have large leverage. Banks that have large sizes also tend to provide loans that are still lower quality. In line with the moral hazard hypothesis, within market reach, banks that have large sizes also tend to be more willing to take risks because of the difficulty of applying market discipline with regulators and other banks that expect assistance from the government in the case of defaults (Ghosh, 2015)

➢ *Hypothesis Testing 3*

Based on the results path analysis in table 5 above, the beta standardized coefficient value direct effect of CAR (X1) on ROA (Y2) of 0.269 with probability of 0.000 <alpha 0.05. This shows that market share has a positive and significant influence on bank profitability. Thus the H3 hypothesis which states that CAR has a direct influence on bank ROA is acceptable.

Capital Adequacy Ratio (CAR) has a significant positive effect on ROA indicating that the higher the CAR, the greater the ROA obtained by the bank. According to (Dendawijaya, 2003), CAR is an indicator of a bank's ability to cover a decrease in its assets as a result of bank losses caused by risky assets. These risky assets tend to limit the amount of capital available in profit-generating activities. The higher the CAR, the stronger the bank's ability to bear these risky earning assets, so as to make profitability increase. The results of this hypothesis are in line with the research conducted by (Menicucci & Paolucci, 2016), (Vernanda & Widyarti, 2016) and (Tran et al., 2016) which states that CAR has a significant positive effect on ROA.

➢ *Hypothesis Testing 4*

Based on the results of path analysis in table 5 above, the standardized beta coefficient value of the direct effect of bank size (X2) on ROA (Y2) is 0.441 with a probability of

0.000 <alpha 0.05. This shows that bank size has a positive and significant direct effect on ROA. Thus the H4 hypothesis which states that bank size has a direct influence on bank ROA is accepted.

Bank size has a positive and significant effect on ROA, this indicates that increasing Size has a significant effect on increasing ROA. Banks that have large total assets have an influence in gaining profits by managing good productive assets that can reduce non-performing loans. This result is in line with the results of previous studies conducted by (Menicucci & Paolucci, 2016) and (Adelopo et al., 2018) which states that Size has a positive and significant effect on ROA.

- *Hypothesis Testing 5*

Based on the results of the path analysis in table 5 above, the beta standardized coefficient value directly influences NPL (Y1) on ROA (Y2) of -0,327 with a probability of 0,000 <alpha 0.05. This shows that the NPL has a negative direct effect and is significant for ROA. Thus the H4 Hypothesis which states that NPL has a negative and significant effect on bank ROA is accepted.

The higher NPL signifies the worse quality and management of bank loans which causes the number of problem loans to be higher. The high level of NPL makes banking companies have to bear losses in their operational activities so that it affects the decrease in ROA. These findings are supported by the results of previous studies conducted by (Ntow & Alu, 2016) and (Ambarawati & Abundanti, 2018) which state that NPL has a negative and significant effect on ROA.

- *Hypothesis Testing 6*

Based on the results of the analysis of indirect effects in table 5 and the calculation of double test significance values in table 9 above, the coefficient of the indirect effect of CAR (X1) on ROA (Y2) through NPL (Y1) is 0.021 with a probability of 0.005 <alpha 0.05. This shows that CAR has an indirect influence on bank ROA. Or in other words, NPL is able to mediate the effect of CAR on bank ROA. Thus H6 Hypothesis states that CAR has an indirect influence on bank ROA through bank NPL is acceptable.

According to (Dendawijaya, 2003), CAR is an measure of a bank's ability to cover a decrease in its assets as a result of bank losses caused by risky assets. These risky assets tend to limit the amount of capital available in profit-generating activities. The higher the CAR, the stronger the bank's ability to bear these risky earning assets, so as to make profitability increase. With a high CAR value and proper credit, management can reduce the number of non-performing loans so that it will increase bank profits.

- *Hypothesis Testing 7*

Based on the results of the analysis of indirect effects in table 5 and calculation of double test significance values in table 9 above, we obtain the Bank size (X2) indirect effect coefficient on ROA (Y2) through NPL (Y1) of -0,056 with probability amounting to 0.194> alpha 0.05. This shows that the bank size has an indirect and insignificant influence on bank ROA. Thus the H7 hypothesis which states that bank size has an indirect influence on bank ROA through a bank NPL is rejected.

Banks that have large total assets cannot give influence in gaining profits because there are still many bad loans and the high operational costs of the company are not comparable with the returns obtained.

V. CONCLUSION

Some things that can be concluded from this research are:

Bank size has a positive influence on NPL. This indicates that large assets can increase the credit channeled which can increase the occurrence of credit risk when credit is not managed properly. CAR proved to have a positive influence on ROA. The higher the CAR, the stronger the bank's ability to bear risky earning assets, in this case, NPL, so that it can increase bank profitability.

Bank size is proven to have a positive influence on ROA. With large assets that are dominated by productive assets and managed well, they will also generate large profits. NPL has a negative effect on ROA. The higher NPL signifies the worse quality and management of bank loans which causes the number of problem loans to be higher. The high level of NPL makes banking companies have to bear losses in their operational activities so that it affects the decrease in ROA.

CAR proved to have an indirect positive influence on Return On Assets (ROA) through NPL. The higher the CAR, the stronger the bank's ability to cover the decline in its assets as a result of bank losses caused by risky earning assets in this case the NPL, which can make bank profitability increase.

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