

## **The Influence of Productive Asset Quality, Loan to Deposit Ratio, Non Performing Loan, and Operating Expenses to Operating Income on Profit with Capital Adequacy Ratio as Moderating Variable in Indonesian Banking**

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### **ABSTRACT**

*Banking has an important role in the economy and has a function as an agent of trust, agent of development, and agent of services. In creating a healthy banking system, Bank Indonesia issued a program to strengthen national banking to strengthen capital in order to improve the ability of banks to manage business and risk. The purpose of this study was to analyze the effect of earning asset quality, loan to deposit ratio, non-performing loans, and operating expenses on operating profit with the capital adequacy ratio as a moderating variable in Indonesian banking. The sample selection was carried out by purposive sampling method, namely the 10 largest banks in Indonesia. The model estimation analysis method is done by panel data regression analysis. The results showed that the CAR variable as an intervention variable succeeded in increasing the effect of earning asset quality, loan to deposit ratio, non-performing loans, and expenses to operating income on return on assets.*

***Keywords:** return on assets, capital adequacy ratio, earning asset quality, operating expenses to operating income*

### **INTRODUCTION**

According to Law No. 10 of 1998, a bank is a business entity that collects funds from the public in the form of savings and also distributes them to the public in the form of credit or other forms in order to improve the standard of living of the people at large. The function of the bank is as an agent of trust, agent of development, and agent of services.

According to Bank Indonesia Regulation No. 13/1/PBI/2011 risk profile is an assessment of the inherent risk and quality of risk management implementation in bank operations which is carried out on eight risks, namely, credit, market, liquidity, operational, legal, strategic, compliance and reputation risks. In this study, two variables were selected, namely (1) credit risk using the non-performing loan (NPL) ratio and (2) liquidity risk using the loan to deposit ratio (LDR).

The capital indicator is the center of banking power, therefore the criteria for measuring bank health and performance are very crucial things to be considered by the management. The capital ratio criteria must be prioritized considering that the banking industry is an industry that

in its business activities relies on public trust. For some people, to see the health of the bank is through the aspect of capital and on that basis the community can build trust to submit their funds to the bank. The Data shown that in 2010 KAP experienced an increase but its ROA decreased.

In 2013 LDR increased but in the same year ROA decreased compared to last year, in 2010 NPL increased but in the same year ROA also experienced an increase compared to last year, in 2017 BOPO increased but in the same year ROA also increased compared to last year. Base on the gaps or problems above, the researchers conducted this research.

Given the importance of capital in banks, in 1988 the Bank for International Settlements (BIS) issued a concept of a capital framework which is better known as The 1988 Accord (Basel I). This system was created as an application of a measurement framework for credit risk, by requiring a minimum capital standard of 8%. In line with the development of existing products in the banking world, BIS again refined the existing capital framework in The 1988 Accord by issuing a new capital concept, namely The New Based Capital Accord/Agreement, better known as Basel II. Basel II in Indonesia is part of the stages of the Indonesian Banking Architecture which was carried out for the period 2004 to 2013.

With a good analysis of financial statements, banks can further optimize the preparation of strategic plans in the future in minimizing financial risks that arise. For this reason, as a tool to measure the fulfillment of capital obligations, it can be calculated using the CAR ratio where Bank Indonesia sets a CAR of 8% (Ali, 2006). The reason for choosing the CAR variable as the dependent variable is because CAR is the most important indicator according to Bank Indonesia in maintaining the soundness of banks.

Profitability is an indicator to measure the performance of a bank. In determining the soundness of a bank, which ultimately reflects the sustainability of a bank's financial performance, Bank Indonesia attaches importance to the assessment of profit based on Return on Assets (ROA). The greater the ROA of a bank, the greater the level of profit achieved by the bank and the better the position of the bank in terms of asset use, so in this study, return on assets (ROA) was used.

Based on research conducted by Sukmana (2017) with the titles ROA, ROE and LDR partially have a significant effect on CAR., Rodiyah & Wibowo (2016) with the title CAR has a significant effect on profit growth, Andini & Yunita (2015) with the titles ROA, ROE, NPL and LDR have a significant effect simultaneously on CAR. Base on the previous research above, the researchers conducted a study on the Analysis of the Effect of Earning Asset Quality, LDR, NPL and BOPO on earnings with CAR as an intervening variable.

The management of a bank always pays attention to the profits of its bank, like other non-bank companies, because banks compete with each other in the capital market, and a high percentage of profit is the key to attracting investors, and meeting shareholder expectations. Most of the bank's income comes from loan interest in addition to investment profits, as well as fees from off-balance sheet activities (Hermawan Darmawi, 2011). The ratio that represents operating costs to operating income is the operating expenses of operating income (OEOI). The ratio used to represent the amount of credit disbursed is the loan to deposit ratio (LDR). Although the amount of credit provides benefits from credit interest, banks need to maintain good credit quality so as not to erode bank profits. Well maintained credit quality will affect the quality of earning assets (QEA) and bad loans/non performing loans (NPL) are well maintained as well.

Several studies related to Return On Assets (ROA) gave different results, including the results of Cahyo Hindarto (2011) QEA had a significant positive effect on ROA. The results of this study are different from the research of Munir Nur Komarudin (2018) QEA has no significant effect on ROA. Research conducted by Indah Fajrin Romadani (2017) has no significant effect on ROA, LDR has a positive and significant effect on ROA, and OEOI has a negative and significant effect on ROA. This is different from the research of Alvita Chatarine and Putu Vivi Lestari (2013), OEOI has a positive and significant effect on ROA. Therefore, further research is needed to see how much influence QEA, LDR, NPL, OEOI, and CAR have on Profit, so the authors are interested in examining more deeply: The Influence of productive asset quality, loan to deposit ratio, non-performing loans, and operating expenses to operating income on profit with capital adequacy ratio as moderating variable in Indonesian Banking. The novelty from this study is might the first study that the bank's profit is not only influenced by the amount of value, but there are other factors that influence it, namely LDR, NPL and BOPO.

The purpose of this study is to find out the strategies to solve the problem by analyze:

1. the influence of QEA on CAR in Indonesian Banking
2. the influence of LDR on the CAR in Indonesian Banking.
3. the influence of NPL on the CAR in Indonesian Banking.
4. the influence of OEOI on CAR in Indonesian Banking.
5. the influence of QEA on ROA in Indonesian Banking
6. the influence of LDR on ROA in Indonesian Banking
7. the influence of NPL on ROA in Indonesian Banking.
8. the influence of OEOI on ROA in Indonesian Banking.
9. the influence of CAR on ROA in Indonesian Banking.

## THEORETICAL REVIEW

### 1. Financial Performance

To assess the health of a bank can be measured by various methods. The health assessment will affect the bank's ability and customer loyalty to the bank concerned. One of the tools to measure bank health is CAMEL analysis (Capital, Assets, Management, Earning, Liquidity). Aspects of capital (capital) include CAR, aspects of assets include NPL and QEA, aspects of earnings include ROA and OEOI, liquidity aspects include LDR. These aspects are then assessed using financial ratios so that they can assess the financial condition of banking companies (Kasmir, 2012)

### 2. Return on Assets (ROA)

To measure the level of profit of a company, a profit ratio or profitability ratio is used, also known as the profitability ratio. Profitability ratio is a ratio to assess the company's ability to seek profit (Kasmir, 2012). This ratio also provides a measure of the level of management effectiveness of a company. This is indicated by the profit generated from sales and investment income. One of the profitability ratios is ROA (Return On Assets). ROA is the ratio of net income after tax in relation to average total assets (Van Greuning & Bratanovic, 2011 ). The higher the ROA of a bank, the better the financial performance of the bank. ROA is the multiplication of the net income margin factor with asset turnover. Net income margin shows the ability to earn profit from each sale created by the company, while asset turnover shows how far the company is able to create the creation of its assets. If both of these factors increase, then ROA also increases, meaning that the company's profitability increases, and the impact is increasing the confidence of shareholders and investors (Suad Husnan, 1998). According to Tarmidhi (2003) if a bank has a high ROA indicates that the bank has a great ability to increase operating profit and its future prospects when it is associated with the funds from the profits collected.

### 3. Quality of Earning Assets (QEA)

Productive assets or productive assets are often also called earning assets because the placement of bank funds is to achieve the expected level of income. Earning assets are bank placements in the form of credit, securities, investments, and other investments with the aim of earning income . Most of the placements in these assets are in the form of credit, which may pose risks. Therefore, the observation and analysis of how the quality of earning assets must be carried out continuously.

Earning Asset Quality is the ratio between Classified Earning Assets (CEA) to Total

Earning Assets. CEA is a productive asset, both existing and containing the potential to not generate income or cause losses, while Total Earning Assets are the total of the Bank's investment in the form of credit, securities, investments and other investments intended to earn income. There are four components in the CEA calculation based on PBI No. 14/15/PBI of 2012 namely: (1) 5% of earning assets classified as special mention; (2) 15% of Earning Assets classified as substandard; (3) 50% of Earning Assets classified as doubtful; (4) 100% of Earning Assets classified as Loss. The smaller the Earning Assets Quality, the more effective the Bank's performance in suppressing CEA and increasing the total earning assets which will increase revenue, so that the profit generated will increase. Therefore, it can be concluded that Earning Asset Quality has a negative effect on earnings (ROA).

#### **4. Loan to Deposit Ratio (LDR)**

Liquidity according to Herman Darmawi (201) is a term used to indicate the stock of cash and other assets that are easily converted into cash. The liquidity measuring instrument that is often used is the LDR (Loan to Deposit Ratio) ratio. In order to make the definition of LDR clearer, the researcher cites several definitions put forward by experts as follows:

According to Kasmir (2012) "LDR (Loan to Deposit Ratio) is the ratio used to measure the composition of the amount of credit given compared to the number of public funds and own capital used." According to Herman Darmawi (2011:61) "LDR is one of the liquid measures of the inventory concept in the form of a loan to deposit ratio."

From the understanding of LDR according to the experts above, it can be concluded that LDR is a ratio that measures the extent to which the bank's ability to repay withdrawals made by depositors by relying on loans provided as a source of liquidity. The higher this ratio, the lower the liquidity of the bank concerned. On the other hand, the lower the LDR ratio, the higher the liquidity of the bank concerned. This ratio is also an indicator of the vulnerability and capability of a bank. According to Kasmir (2012:225), the safe limit of a bank's LDR is around 80%. However, the maximum LDR limit is 110%. The LDR ratio is calculated by comparing credit with third-party funds where the credit used is the total credit extended to third parties, and does not include loans extended to other parties. Meanwhile, third-party funds are demand deposits, savings, and time deposits that are not interbank.

#### **5. Non-Performing Loan (NPL)**

In providing credit to customers, banks will be faced with credit risk that debtors cannot afford to pay, causing non-performing loans. According to Ismail (2009) "NPL is a loan that is in arrears for more than 90 days. Where the NPL is divided into Substandard, Doubtful, and Bad Credit. According to Taswan (2006), the ratio used to assess financial performance in

managing non-performing loans is the ratio of NPL. Non-performing loans are classified into Collectibility, Current, Substandard, Doubtful, and Loss.

The smaller the NPL, the smaller the credit risk borne by the bank. Banks in making credit must analyze the debtor's ability to repay their obligations. After the credit is granted, the bank is required to monitor the use of credit as well as the ability and compliance of the debtor in fulfilling its obligations. The Bank conducts review and binding of collateral to minimize credit risk. The larger the NPL, the greater the reduction in income from loan interest, thereby reducing the bank's ROA. This NPL value will be suppressed by the company so that the ROA obtained can be maximized. The larger the NPL, the greater the reduction in income from loan interest, thereby reducing the bank's ROA. This NPL value will be suppressed by the company so that the ROA obtained can be maximized.

## **6. Operating Expenses to Operating Income (OEOI)**

According to Veithzal Rivai (2013) the definition of OEOI is as follows: "Operational cost of operating income is the ratio used to measure the level of efficiency and ability of the bank in carrying out its operations." Furthermore, according to Malayu Hasibuan (2011), the definition of OEOI is: "Operating Expenses to Operating Income (OEOI) is a comparison or ratio of operating costs in the last 12 months to operating income in the same period".

The OEOI ratio is to determine the level of efficiency of the bank in its operations by comparing operational costs with operating income. Operational costs are the total of all costs directly related to operational activities. Operating Income is the total income from operating activities. SE BI No.6/23/DPNP dated May 31, 2004 explained that the value of the OEOI ratio will look efficient if it reaches a maximum value of 93.52%.

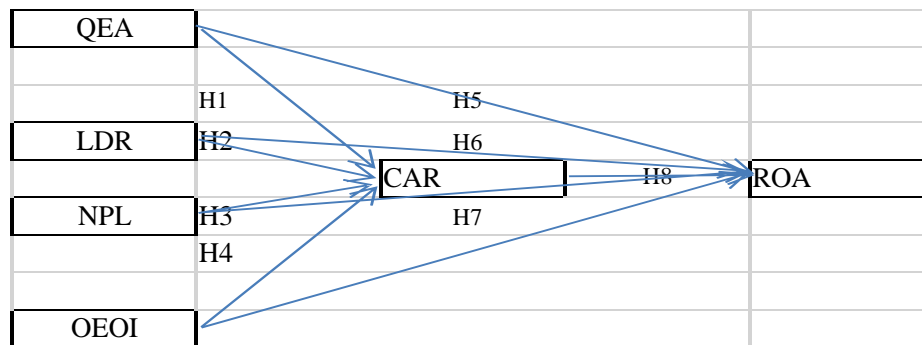
## **7. Capital Adequacy Ratio (CAR)**

Capital Adequacy Ratio (CAR), known as Minimum Capital Adequacy Ratio (KPMM) is a bank's capital adequacy ratio obtained by dividing the total capital covering Tier I, Tier II, and Tier III with risk-weighted assets. According to Taswan (2010) what is meant by the Capital Adequacy Ratio is the ratio of capital adequacy by including market risk in the calculation of capital adequacy using standard methods and internal methods. Capital Adequacy Ratio (CAR) is a capital ratio that shows the bank's ability to provide funds for business development purposes and accommodate the risk of losses caused by bank operational activities. The higher the CAR, the greater the financial resources that can be used to anticipate potential bank losses caused by credit.

According to Dendawijaya (2009), the calculation of the minimum capital adequacy or bank capital adequacy (Capital Adequacy) is based on the ratio or comparison between the

capital owned by the bank and the amount of Risk-Weighted Assets (RWA).

Based on the literature review, the framework proposed in this research is



**Figure 1. Theoretical Thinking Framework**

The independent variables consist of QEA ( $X_1$ ), LDR ( $X_2$ ), NPL ( $X_3$ ), OEOI ( $X_4$ ), CAR ( $Y_1$ ) as moderating variable and the dependent variable is ROA ( $Y_2$ ).

Based on the literature review and research objectives, the hypotheses that can be made in this study are:

- H1 : QEA has an effect on CAR
- H2 : LDR has an effect on CAR
- H3 : NPL affects CAR
- H4 : OEOI affects CAR
- H5 : QEA has an effect on ROA
- H6 : LDR has an effect on ROA
- H7 : NPL affects ROA
- H8 : OEOI has an effect on ROA
- H9 : CAR has an effect on ROA

## METHODOLOGY

### Type and Source of Data

The type of data used in this study is secondary data, namely Earning Assets Quality (QEA), Loan to Deposit Ratio (LDR), Non-Performing Loan (NPL), Operational Cost of Operating Income (OEOI), Capital Adequacy Ratio (CAR), Return on Assets (ROA). These data are taken from the annual Financial Statements of the 10 Largest Banks by Assets in Indonesia from 2009 to 2018. The data on the bank's financial ratios: QEA, LDR, NPL, OEOI, CAR and ROA are taken directly from the Indonesian Banking Annual Financial Statements for 2009-2018.

## Research Population and Sample

The population used in this study were all conventional commercial banks registered with Bank Indonesia, amounting to 116 banks. The time span of bank data processed is conventional commercial bank data from 2009 to 2018. The sample selection of 10 banks used the purposive sampling method, namely the sample selection method based on certain criteria (Sugiyono, 2010).

**Table 1. List of Sample**

Nr	Bank	Stock code	Bank Category
1	Bank Mandiri	BMRI	State-owned enterprises
2	Bank Rakyat Indonesia	BBRI	State-owned enterprises
3	Bank Central Asia	BBCA	Private
4	Bank Negara Indonesia	BBNI	State-owned enterprises
5	Bank CIMB Niaga	BNGA	Private
6	Bank Tabungan Negara	BBTN	State-owned enterprises
7	Pan Indonesia Bank	PNBN	Private
8	Bank Danamon Indonesia	BDMN	Private
9	Bank Maybank Indonesia	BNII	Private
10	Bank Permata Indonesia	BNLI	Private

Source : www.ojk.co.id

## Variable Operations

The operational definition of a variable is described as follows:

**Table 2. Variable Operational Definition**

No	Variable	Definition	Indicators	Scale
1	QEA	The ratio between classified earning assets (CEA) to total earning assets	$QEA = \frac{\text{Classified Earning Assets}}{\text{Total earning Assets}}$	Ratio
2	LDR	The ratio between loans extended to total third party funds	$LDR = \frac{\text{Loans}}{\text{Deposits}}$	Ratio
3	NPL	the ratio of non-performing loans to loans disbursed	$NPL = \frac{\text{Problem Credit}}{\text{Total Credit}}$	Ratio
4	OEOI	The ratio between total operating expenses and total operating income	$OEOI = \frac{\text{Operating Expenses}}{\text{Operating Income}}$	Ratio
5	CAR	the ratio between the capital owned by the bank and the amount risk-weighted assets	$CAR = \frac{(\text{Tier 1 Capital} + \text{Tier 1 Capital})}{\text{Risk Weighted Asset}}$	Ratio
6	ROA	the ratio of profit after tax to total assets	$ROA = \frac{\text{Net Income}}{\text{Average Total Asset}}$	Ratio



## Panel Data Regression Method

The data analysis technique used is multiple regression analysis with panel data regression model to process and discuss the data that has been obtained and to test the proposed hypothesis. Panel data regression model is a regression method that combines cross section and time series data. The advantages of the panel data regression model include producing a greater degree of freedom and being able to overcome the problem of omitted variables (Widarjono: 2018).

The panel data regression model in this study is formulated as follows:

$$\text{Equation 1} \quad \text{CAR} = \beta_0 + \beta_1 \text{QEA}_{it} + \beta_2 \text{LDR}_{it} + \beta_3 \text{NPL}_{it} + \beta_4 \text{OEOI}_{it} + \varepsilon_1$$

$$\text{Equation 2} \quad \text{ROA} = \beta_0 + \beta_1 \text{QEA}_{it} + \beta_2 \text{LDR}_{it} + \beta_3 \text{NPL}_{it} + \beta_4 \text{OEOI}_{it} + \beta_5 \text{CAR}_{it} + \varepsilon_2$$

where:

CAR	:	capital adequacy ratio
ROA	:	return on asset
EAQ	:	earning asset quality
LDR	:	loan to deposit ratio
NPL	:	<i>non-performing loan</i>
OEOI	:	operating expenses to operating income
$\beta_0$	:	constant
$\beta_i$	:	regression coefficient

According to Widarjono (2018), there are three models that can be used to estimate panel data regression, namely:

### 1. Common Effect Model

Common effect is the simplest panel data estimation technique that combines cross section and time series data. In this approach, the inter-individual and inter-time dimensions are not considered. It is assumed that the behavior or characteristics of the data between individuals are the same in various time periods. The common effect model uses the Ordinary Least Square (OLS) method in estimating the panel data model.

### 2. Fixed Effect Model

Fixed effect is a technique based on the assumption that there are differences in intercepts between individuals but the intercepts are the same over time. This model also assumes that the regression coefficient remains between individuals and over time.

### 3. Random Effect Model

Random effect is a model that uses disturbance variables (error terms) to overcome ignorance about the actual model. In this model, panel data is estimated with the assumption that there is a relationship between disturbance variables over time and between individuals. The disturbance variable in question is denoted as  $v_{it}$  which consists of two components, namely the overall disturbance variable  $e_{it}$  and the individual disturbance variable  $i$ . In this case, the disturbance variable  $i$  differs between individuals but remains constant over time. Therefore, this model is also called the error component model (ECM). The right method to be used in the random effect model is generalize least squares (GLS).

### **Panel Data Regression Model Selection**

Widarjono (2018) states that in determining the use of the right model to estimate panel data regression, there are three tests that can be used to choose between common effects, fixed effects, or random effects, namely:

#### 1. Uji Chow

The Chow test is a model selection test to choose between a common effect or fixed effect model that will be used to estimate panel data regression. The hypotheses in the Chow test are:

H0: Common Effect Model

H1: Fixed Effect Model

#### 2. Hausman test

Hausman test is a model selection test to choose between a fixed effect or random effect model that will be used to estimate the panel data regression. The hypotheses in Hausman's test are:

H0: Random Effect Model

H1: Fixed Effect Model

#### 3. Lagrange Multiplier Test

The LM test is a model selection test to choose between a common effect or random effect model that will be used to estimate panel data regression. The hypotheses in the LM test are:

H0: Common Effect Model

H1: Random Effect Model

## **RESULT**

### **Panel Data Regression Model Selection**

The estimation model used in this study is a panel data regression model. In order to test the model specifications and the suitability of the theories with reality, in this section we will

choose which panel data regression model is the best between common effects, fixed effects, or random effects. Data processing in this study aims to select the most appropriate model and data processing in this study using the software (software) Eviews 9.0. The following are the test results of the three models above:

1. Chow test

The following are the results of the Chow test in equation 1 and equation 2

**Table 3. Chow test on equation 1 and equation 2**

Effects Test	Equation 1			Equation 2		
	Statistic	d.f.	Prob.	Statistic	d.f.	Prob.
Cross-section F	2.569640	(9,86)	0.0114	11.459166	(9,85)	0.0000
Cross-section Chi-square	23.816285	9	0.0046	79.449520	9	0.0000

Source: *Output Eviews*

The results of the Chow test above show the Prob value < 0.05 in equations 1 and 2, so H1 is accepted and the recommended model is the Fixed Effect Model.

2. Hausman Test

The following are the results of the Hausman Test in equation 1 and equation 2:

**Table 4. Hausman test on equation 1 and equation 2**

Test Summary	Equation 1			Equation 2		
	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	14.622287	4	0.056	17.799403	5	0.32

Source: *Output Eviews*

Hausman test results in table 4. above, it can be seen that the probability value is greater than the alpha value of 0.05. it means that the suggested model is random.

3. Lagrange Multiplier Test

The results of the Lagrange Multiplier test of equation 1 and equation 2 are as follows.

**Table 5 . Lagrange Multiplier test on equation 1 and equation 2**

Test Hypothesis	Equation 1			Equation 2		
	Cross-section	Time	Both	Cross-section	Time	Both
Breusch-Pagan	0.000693 (0.00979)	62.34838 (0.0000)	62.34907 (0.0000)	37.01154 (0.0000)	1.514854 (0.2184)	38.52640 (0.0000)

Source: *Output Eviews*

The results of the Lagrange Multiplier test above, the probability value of Breusch Pagan is 0.0000 or less than the alpha value of 0.05. meaning that the selected model is a random effect.

Based on the results of the panel data regression model selection which was carried out

using the Chow test, Hausman test, and the Lagrange Multiplier test, the linear regression of the panel data in this study used the random effect method to test the panel data in this study. The following are the results of the panel data regression test using the random effect method in equation 1:

**Table 6. Panel Data Regression Equation 1 with Random Effect Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.188073	0.029362	6.405214	0.0000
QEA	-0.614378	0.992422	-0.619069	0.5374
LDR	0.067116	0.024987	2.686048	0.0785
NPL	0.686229	0.772631	2.182452	0.0315
OEOI	-0.138593	0.038783	-3.573567	0.0006

Source: *Output Eviews*

The following are the results of the regression equation based on the results of the panel data regression test using the Random effect method:

$$CAR = 0.188073 - 0.614378 QEA + 0.067116 LDR + 0.686229 NPL - 0.138593 OEOI$$

The explanation of the regression equation is as follows:.

A constant of 0.188 means that if X1 (QEA), X2 (LDR), X3 (NPL), X4 (OEOI) the value is 0, then the Y (CAR) value is 0.188%. The regression coefficient for the X1 variable (QEA) is -0.61. This shows that every 1% increase in QEA will result in a 0.61% decrease in CAR. The regression coefficient of the X2 variable (LDR) is 0.067. This shows that every 1% increase in LDR will result in an increase in CAR of 0.06%, . The regression coefficient for the X3 variable (NPL) is 0.69. This shows that every 1% increase in NPL will result in an increase in CAR of 0.69%, . The regression coefficient for the X4 variable (OEOI) is -0.14. This shows that every 1% increase in OEOI will result in a 0.14% decrease in CAR.

**Table 7. Panel Data Regression Equation 2 with the Random Effect Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.048477	0.010894	4.449933	0.0000
QEA	-0.141817	0.245747	-0.577084	0.5653
LDR	0.017920	0.008333	-0.215045	0.8302
NPL	0.169903	0.193759	1.392983	0.0169
OEOI	-0.225004	0.011998	-2.084029	0.0099
CAR	-0.035680	0.023115	-1.543601	0.0126

Source: *Output Eviews*

The following are the results of the regression equation based on the results of the panel data regression test using the Random effect method:

$$ROA = 0.048477 - 0.141817 QEA + 0.017920 LDR + 0.169903 NPL - 0.225004 OEOI - 0.035680 CAR$$

The regression equation can be described as follows:

A constant of 0.048 means that if X1 (QEA), X2 (LDR), X3 (NPL), X4 (OEOI), and X5 (CAR), the value is 0, then the value of Y (ROA) is 0.048%. The regression coefficient for the X1 variable (QEA) is -0.14. This shows that every 1% increase in QEA will result in a 0.14% decrease in ROA. The regression coefficient for the X2 variable (LDR) is 0.0179. This shows that every 1% increase in LDR will result in an increase in ROA of 0.0179%, . The regression coefficient for the X3 variable (NPL) is 0.17. This shows that every 1% increase in NPL will result in an increase in ROA of 0.17%. The regression coefficient for the X4 variable (OEOI) is -0.225. This shows that every 1% increase in OEOI will result in a 0.225% decrease in ROA. The regression coefficient for the X5 variable (CAR) is -0.036. This shows that every 1% increase in CAR will result in a decrease in ROA of 0.036%.

### Hypothesis Testing Results

The results of the t-test in this study can be seen in table 6 and table 7 above:

**Table 8. t-test Results**

Equation	Variable	Probability	Decision
I	QEA	0.5374	H1 rejected
	LDR	0.0785	H2 rejected
	NPL	0.0315	H3 accepted
	OEOI	0.0006	H4 accepted
II	QEA	0.5653	H5 rejected
	LDR	0.8302	H6 rejected
	NPL	0.0169	H7 accepted
	OEOI	0.0099	H8 accepted
	CAR	0.0126	H9 accepted

Source : *Output Eviews*

The effect of QEA on CAR. QEA has a significance value of  $0.5374 > 0.05$ , so it can be concluded that QEA has no significant effect on CAR, so the hypothesis is rejected. The results of this study show the same thing as research by Alvita Chatarine and Putu Vivi Lestari (2013). According to data in the Indonesian Banking Statistics in 2018, the minimum capital for all commercial banks in Indonesia is IDR 1,269 trillion and productive assets classified as non-performing are all commercial banks in Indonesia amounting to IDR 91 trillion. So that productive assets classified as non-performing are only 7% of the minimum capital value of commercial banks in Indonesia, this strengthens that QEA has no significant effect on CAR. Pengaruh LDR terhadap CAR. LDR mempunyai nilai signifikansi  $0.0785 > 0.05$ , It can be

concluded that LDR has no significant effect on CAR, so the hypothesis is rejected. The results of this study show the same thing as the research by Choerudin, et all (2016), Andini & Yunita (2015).

The increase in LDR from 2017 to 2018, but CAR actually decreased, so this strengthens that LDR has no significant effect on CAR. With the increase in lending, there are two possibilities for the bank. The first possibility, can benefit the bank because smooth loans will generate profits from credit interest. The second possibility could harm the bank because of bad loans. So that the increase in LDR in terms of increasing loans there are two possibilities for the value of the CAR, these two possibilities can increase the CAR value or can reduce the CAR value, and the value that affects it is not significant.

The effect of NPL on CAR. NPL has a significance value of  $0.0315 < 0.05$ , so it can be concluded that NPL has a significant effect on CAR, so the hypothesis is accepted. The results of this study show the same thing as research by Gladis Kusuma Jaya (2017), Achmad Choerudin, Eny Yuniatun, and Bambang Kusdiasmo (2016), Fathiyah Andini and Irni Yunita (2015). With the decrease in NPL from 2017 to 2018, there was also a decrease in CAR. The increase in NPL will affect the risk experienced by the bank, this will also affect the Risk-Weighted Assets (RWA), the RWA will also affect the CAR value. Pengaruh OEOI terhadap CAR. NPL mempunyai nilai signifikansi  $0.0006 < 0.05$ , It can be concluded that OEOI has a significant effect on CAR, so the hypothesis is accepted. Increased operational costs and reduced operating income will harm the bank and affect CAR. The effect of QEA on ROA. QEA has a significance value of  $0.5653 > 0.05$ , so it can be concluded that QEA has no significant effect on ROA, so the hypothesis is rejected. The results of this study show the same thing as research by Munir Nur Komarudin (2018), Alvita Chatarine and Putu Vivi Lestari (2013), Cahyo Hindarto (2011). A low QEA value means that the bank has a good ability to manage its assets so that it is able to get profitability from the results of the placement of these assets through productive assets, as well as a bank that has a high QEA than the bank has a poor ability to manage its assets due to the inappropriate placement of assets against Productive Assets. According to data in the Indonesian Banking Statistics in 2018, earning assets classified as current for all commercial banks in Indonesia amounted to Rp 6,583 trillion, and earning assets classified as bad for all commercial banks in Indonesia amounted to Rp 91 trillion. So that earning assets classified as non-performing are only 1.3% of the value of productive assets classified as current commercial banks in Indonesia, so the value of QEA has no significant effect on ROA.

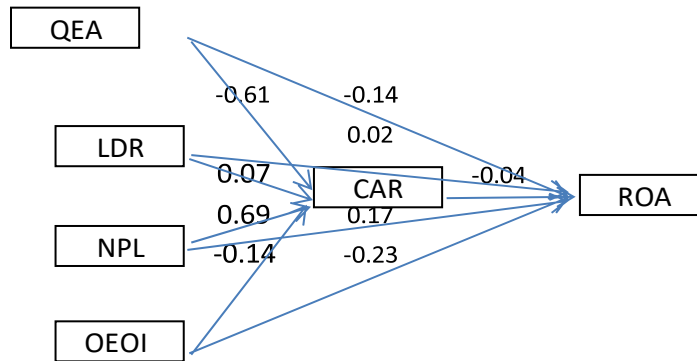
Effect of LDR on ROA. LDR has a significance value of  $0.8302 > 0.05$ , so it can be

concluded that LDR has no significant effect on ROA, so the hypothesis is rejected. The results of this study show the same thing as research by Achmad Choerudin, Eny Yuniatun, and Bambang Kusdiasmo (2016), Adiyanto (2016), Chandra Chintya Putri (2015), Rida Hermina and Edy Suprianto (2014), and Anggita Puji Santosa (2012). . An increase in loans will affect the value of the LDR. An increase in loans (loans) if the customer is smooth in paying interest or loan installments, will benefit the bank and will affect the increase in its ROA value. However, if the loan increases, but the customer is stuck in paying interest or loan installments, this will be detrimental to the bank and will affect the decrease in the value of its ROA. So the effect of LDR on ROA depends on the increase or decrease in the LDR value and the effect is not significant.

The effect of NPL on ROA. NPL has a significance value of  $0.0169 < 0.05$ , so it can be concluded that NPL has a significant effect on ROA, so the hypothesis is accepted. The results of this study show the same thing as research by Achmad Choerudin, Eny Yuniatun, and Bambang Kusdiasmo (2016), Adiyanto (2016), Dwi Indah Putrianingsih and Arief Yulianto (2016), Fathiyah Andini and Irni Yunita (2015), Luh Eprima Dewi, Nyoman Trisna Herawati and Luh Gede Erni Sulindawati (2015), and Ahmad Buyung Nusantara (2009). An increase in NPL will reduce bank profits because the amount of bad loans causes the loan to be unable to pay credit interest or credit installments. In accordance with PBI No: 13/26/PBI/2011 concerning CKPN (Allowance for Impairment Losses), banks must make reserves due to NPLs so that this affects bank profits as well. Pengaruh OEOI terhadap ROA. OEOI mempunyai nilai signifikansi  $0.0121 < 0.05$ , It can be concluded that OEOI has a significant effect on ROA, then the hypothesis is accepted. The results of this study show the same thing as Indah Fajrin Romadani's research (2017), Erna Sudarmawanti and Joko Pramono (2016), and Kuntari Dasih (2014). The addition or reduction of operational costs will affect ROA, as well as the addition or reduction of operating income will affect ROA. Effect of CAR on ROA. CAR has a significance value of  $0.0126 < 0.05$ , so it can be concluded that CAR has a significant effect on ROA, so the hypothesis is accepted. The results of this study show the same thing as research by Achmad Choerudin, Eny Yuniatun, and Bambang Kusdiasmo (2016), Adiyanto (2016), Kuntari Dasih (2014), Meryta Wityasari and Irene Rini Demi Pangestuti (2014), and Anggita Puji Santosa (2012). The adequacy of bank capital reflects the company's own capital, the greater the bank's capital adequacy, the greater the ROA because, with large capital, bank management is very flexible in placing their funds into profitable investment activities.

### Direct Effect, Indirect Effect and Total Effect

With the moderating variable (CAR), this study will explain the direct effect, indirect effect and total effect as follows:



**Figure 2. Direct, Indirect and Total Effect**

#### a. Direct Effect

1. The effect of QEA on ROA. The test results with the second regression equation model that have been carried out show that QEA has a beta coefficient of -0.14, meaning that QEA has a negative effect on ROA. The smaller the Earning Assets Quality, the more effective the Bank's performance in suppressing CEA and increasing the total earning assets which will increase revenue, so that the profit generated will increase.
2. Effect of LDR on ROA. The test results with the second regression equation model that have been carried out show that LDR has a beta coefficient of 0.02, meaning that LDR has a positive effect on ROA. LDR has a positive effect on ROA profitability. The higher the LDR ratio indicates that more and more third-party funds are being disbursed in the form of credit. This will provide greater interest income which will increase profitability.
3. The effect of NPL on ROA. The test results with the second regression equation model that have been carried out show that NPL has a beta coefficient of 0.17, meaning that NPL has a positive effect on ROA. NPL has a positive effect on ROA, non-performing loans increase but ROA actually increases this is due to AYDA from non-performing loans from previous years being successfully sold in the following year thereby increasing other operating income which increases bank profits.
4. The effect of OEOI on ROA. The results of the test with the second regression equation model that have been carried out show that OEOI has a beta coefficient of -0.23, meaning that OEOI has a negative effect on ROA. The smaller the OEOI indicates the more effective the Bank's performance is to reduce operating costs and increase operating



income which will increase revenue so that the profit generated will increase.

5. Effect of CAR on ROA. The test results with the second regression equation model that have been carried out show that CAR has a beta coefficient of -0.04, meaning that CAR has a negative effect on ROA. If CAR increases, ROA will decrease. This means that in this case the availability of paid-up capital to Bank Indonesia is only for capital reserves and to cover losses due to bank losses caused by risky assets, so a lot of capital is unemployed, this can be seen from the average CAR ratio of the Bank. General amounted to 17.09% which is already more than the minimum capital requirement of 8% of risk-weighted assets.

#### b. Indirect Effect

1. The indirect effect of QEA on ROA through CAR. The test results with the first and second regression equation models that have been carried out show that the effect of QEA on CAR is -0.61, while the effect of QEA on ROA through CAR is 0.0183. This result when multiplied ( $-0.61 \times -0.04$ ) equal to 0.0244. Multiplying these coefficients, it can be concluded that the CAR variable can be used as an intervening variable for the effect of QEA on ROA because the coefficient value is  $0.0244 > -0.14$  (direct effect). These results indicate to increase ROA, it is better to do it indirectly through CAR.
2. Indirect effect of LDR on ROA through CAR. The test results with the first and second regression equation models that have been carried out show that the effect of LDR on CAR is 0.07, while the effect of LDR on ROA through CAR is -0.0021. This result when multiplied ( $0.07 \times -0.04$ ) equals -0.0028. Multiplying these coefficients, it can be concluded that the CAR variable cannot be used as an intervening variable for the effect on ROA because the coefficient value is  $-0.0028 < 0.002$  (direct effect). These results indicate to increase ROA, it is better to do it directly through LDR.
3. Indirect effect of NPL on ROA through CAR. The test results with the first and second regression equation models that have been carried out show that the effect of NPL on CAR is 0.69, while the effect of NPL on ROA through CAR is -0.0207. This result when multiplied by ( $0.69 \times -0.04$ ) equals -0.0276. Multiplying these coefficients, it can be concluded that the CAR variable cannot be used as an intervening variable for the effect on ROA because the coefficient value is  $-0.0276 < 0.17$  (direct effect). These results indicate to increase ROA, it is better to do it directly by increasing NPL.
4. The indirect effect of OEOI on ROA through CAR. The test results with the first and second regression equation models that have been carried out show that the effect of OEOI on CAR is -0.14, while the effect of OEOI on ROA through CAR is 0.0056. This

result when multiplied  $(-0.14 \times -0.04)$  equals 0.0056. Multiplying these coefficients, it can be concluded that the CAR variable can be used as an intervening variable for the effect of OEOI on ROA because the coefficient value is  $0.0056 > -0.23$  (direct effect). These results indicate to increase ROA, it is better to do it indirectly through CAR.

### c. Total Effect

1. The total effect of QEA on ROA through CAR. Based on the results of the first and second regression equation model tests that have been carried out, it shows that the effect of QEA on ROA is -0.14, while the indirect effect of QEA on ROA through CAR is 0.0244, a coefficient of -0.1156 means that the variable total influence of QEA on ROA is -0.1156.
2. The total effect of LDR on ROA through CAR. Based on the results of the first and second regression equation model tests that have been carried out, it shows that the effect of LDR on ROA is 0.002, while the indirect effect of LDR on ROA through CAR is -0.0021, a coefficient of -0.0001 means that the total influence variable of LDR on ROA is -0.0001.
3. The effect of total NPL on ROA through CAR. Based on the results of the first and second regression equation model tests that have been carried out, it shows that the effect of NPL on ROA is 0.17, while the indirect effect of NPL on ROA through CAR is -0.0207, a coefficient of 0.1493 means that the variable total influence of NPL on ROA is 0.1493.
4. The effect of total OEOI on ROA through CAR. Based on the results of the first and second regression equation model tests that have been carried out, it shows that the effect of OEOI on ROA is -0.23, while the indirect effect of OEOI on ROA through CAR is 0.0056, a coefficient of -0.2244 means that the variable total effect of OEOI on ROA is -0.2244.

## CONCLUSION

This study examines the effect of Earning Assets Quality (QEA), Loan to Deposit Ratio (LDR), Non Performing Loans (NPL), and Operating Income Operating Costs (OEOI) on Return On Assets (ROA) with Capital Adequacy Ratio (CAR) as Intervening Variables in Banking Companies in Indonesia.

Conclusions that can be drawn from the results of this study include:

The effect of QEA on CAR is negative and not significant. QEA is the ratio between Earning Assets classified (CEA) to Total Earning Assets. Where CEA is a productive asset, both existing and containing the potential not to provide income or cause losses. The higher the CEA value, the more detrimental the bank will be. So that QEA affects CAR negatively.

The effect of LDR on CAR is positive and not significant. The positive relationship

obtained in this study means that LDR is directly proportional to CAR. If the LDR increases, the CAR will increase and vice versa if the LDR decreases, the CAR will decrease. The relationship between LDR and CAR is not significant, it can be caused by the growth of loans that have been disbursed, where a high CAR can cause credit growth to also increase, so based on this, even though the LDR has increased but if the growth of loans disbursed every year does not have a change then the effect on the real value of capital becomes unaffected.

The effect of NPL on CAR is positive and significant. The debtor is less productive or less than optimal in its use, the bank cannot carry out its business activities smoothly so if the bank suffers losses continuously there will be a possibility that the capital owned will also be eroded due to being used to cover the resulting losses. Efforts in credit restructuring, one of which is carried out by taking over of collateral or Foreclosed Collateral (AYDA) where the takeover of the collateral is temporary in order to settle loans with bad quality and within a maximum period of two (2) years since the takeover of the collateral cannot be completed. by the bank, it is required to finance the AYDA, so that when the NPL increases with the collateral taken over by the bank from the debtor, the collateral can become a new bank asset that can increase capital for the bank to increase its operational activities.

The effect of QEA on ROA is negative and not significant. The smaller the Earning Assets Quality, the more effective the Bank's performance in suppressing CEA and increasing the total earning assets which will increase revenue, so that the profit generated will increase.

The effect of LDR on ROA is positive and not significant. That LDR has a positive effect on ROA profitability. The higher the LDR ratio indicates that more and more third-party funds are being disbursed in the form of credit. This will provide greater interest income which will increase profitability.

The effect of NPL on ROA is positive and significant. NPL has a positive effect on ROA, non-performing loans increase but ROA actually increases this is due to AYDA from non-performing loans from previous years being successfully sold in the following year thereby increasing other operating income which increases bank profits.

The effect of CAR on ROA is negative and significant, meaning that if CAR increases, ROA will decrease. This means that in this case, the availability of paid-up capital to Bank Indonesia is only for capital reserves and to cover losses due to bank losses caused by risky assets so a lot of capital is unemployed, this can be seen from the average CAR ratio of the Bank. General amounted to 17.09% which is more than the minimum capital requirement of 8% of risk-weighted assets.

The effect of QEA on ROA through CAR. The test results with the first and second

regression equation models that have been carried out show that the CAR variable can be used as an intervening variable for the effect of QEA on ROA. These results indicate to increase ROA, it is better to do it indirectly through CAR. These results indicate to increase ROA, it is better to do it indirectly by increasing CAR. This means that increasing ROA from QEA improvements, it requires capital reserves or CAR.

The effect of LDR on ROA through CAR. The test results with the first and second regression equation models that have been carried out show that the CAR variable cannot be used as an intervening variable for the effect of LDR on ROA. These results indicate to increase ROA, it is better to do it directly by increasing LDR. These results indicate to increase ROA, it is better to do it directly by increasing LDR. This means that in increasing ROA from interest income, bank lending does not require capital reserves or CAR because a high LDR ratio indicates an increasing number of third-party funds disbursed in the form of credit. This will provide greater interest income which will increase profitability or ROA.

Effect of NPL on ROA through CAR

### **Managerial Implications**

Based on the conclusions above, the implications of this research are as follows:

The decline in Earning Assets Quality (QEA) will lead to an increase in the profitability of commercial banks in Indonesia. The real thing that needs to be done by banks is to minimize earning assets, both those that already have or that contain the potential to not generate income or cause losses and maximize Total Earning Assets that generate in the form of credit, securities, investments, and other investments.

An increase in the Loan to Deposit Ratio (LDR) will lead to an increase in the profitability of commercial banks. Credit distribution can have a positive and negative impact on CAR and ROA. Therefore, banks need credit distribution to be very controlled because credit with bad collectibility has a greater risk so risk-weighted assets will also be higher and profits will also be higher.

In this study, an increase in non-performing loans (NPL) of banks will increase the profitability of commercial banks in Indonesia. Banks must play an active role in NPL guarantees or Foreclosed Assets (AYDA) that are promoted effectively through the website and can also provide incentives to internal bank employees who successfully sell AYDA to other parties. So that the sales of AYDA can add to other operating income and will also increase the bank's profit.

An increase in bank capital adequacy (CAR) will lead to an increase in the profitability of commercial banks in Indonesia. The real thing that needs to be done by banks is to strengthen

their capital structure, this can be done by increasing the amount of reserved profit or increasing paid-in capital. On the other hand, banks need to maintain the quality of their assets, in which bank assets that have the highest risk are credit. Credit disbursement must be very controlled because credit with bad collectibility has a greater risk, so risk-weighted assets will also be higher.

The CAR variable can be used as an intervening variable for the effect of QEA on ROA. In increasing ROA from improving QEA, it requires capital reserves or CAR. Banks can increase bank capital adequacy (CAR) to improve QEA value and increase profit (ROA).

### Research limitations

This research was only conducted at banks with large capital adequacy, further research could be carried out more broadly by involving medium and small banks. This research only involving productive asset quality, loan to deposit ratio, non-performing loan, and operating expenses to operating income on profit with capital adequacy ratio, for further research to involve other variables such as Bank Indonesia Certificate Level (SBI), allowance for impairment losses (CKPN), current account saving account (CASA), so that it is expected to have more in-depth research results.

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