Profitability Factors Using the Loans to Deposits Ratio as a Moderating Variable

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Abstack

The establishment of a banking company can benefit the economy and the welfare of the people. Banking institutions lend money to the public in order to keep the economy running smoothly. Banks' primary goal is to increase profits or profitability, which is measured by the value of Return on Assets (ROA). Several factors, including non-performing loans (NPLs) and capital adequacy, can have an impact on profitability (CAR). The goal of this study is to determine the impact of NPLs and CARs on profitability (ROA) using the Loan to Deposit Ratio (LDR) as a moderating variable. Financial statements of publicly listed companies (Tbk) of public and government private banks registered with the Financial Services Authority serve as secondary research data (OJK).

Keyword : Profitability, Loans to Deposits Ratio (LDR), Moderating Variable.

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INTRODUCTION

Since the end of 2019 the whole world has been shocked by the coronavirus (Covid -19), as a result there has been economic turmoil in every sector. The economic sector that also has an impact is the banking company. Banking has a very important role in improving the Indonesian economy, one of which is by providing credit to the public. Through the provision of credit, companies can increase their profitability, as well as increase economic activity. The profitability of banking companies can be influenced by several factors, including non-performing loans (NPL) and Capital Adequacy Ratio (CAR). Information from the Financial Services Authority (OJK) at the end of December 2019, the NPL of financial institutions was 2.37% less than at the end of December 2019 of 2.53%, then in October 2020 there was an increase of 3. 15% and in July 2021 the NPL was recorded at 3.34%. The increase in NPLs in 2021 is due to the fact that loans extended to customers or the public cannot be returned to the bank. Bank Indonesia Regulation Number: 13/1/PBI/2011 Concerning the Soundness Rating of Commercial Banks states that an NPL ratio of 2% is quite healthy, 2-5% is said to be healthy, 5%-9% is quite healthy, 9%-12% is less healthy, and above 12% unhealthy. Referring to Bank Indonesia regulations regarding bank health, it can be concluded that the lower the NPL, the healthier the bank's soundness level, so that a healthy bank has increased profitability. The low value of the Non-Performing Loan (NPL) ratio will increase profitability for the company, so that the company's performance is considered good (Putrianingsih & Yulianto, 2016). The increase in NPLs in 2021 is due to the fact that loans extended to customers or the public cannot be returned to the bank. Bank Indonesia Regulation Number: 13/1/PBI/2011 Concerning the Soundness Rating of Commercial Banks states that an NPL ratio of 2% is quite healthy, 2-5% is said to be healthy, 5%-9% is quite healthy, 9%-12% is less healthy, and above 12% unhealthy. Referring to Bank Indonesia regulations regarding bank health, it can be

concluded that the lower the NPL, the healthier the bank's soundness level, so that a healthy bank has increased profitability. The low value of the Non-Performing Loan (NPL) ratio will increase profitability for the company, so that the company's performance is considered good (Putrianingsih & Yulianto, 2016). The increase in NPLs in 2021 is due to the fact that loans extended to customers or the public cannot be returned to the bank. Bank Indonesia Regulation Number: 13/1/PBI/2011 Concerning the Soundness Rating of Commercial Banks states that an NPL ratio of 2% is quite healthy, 2-5% is said to be healthy, 5%-9% is quite healthy, 9%-12% is less healthy, and above 12% unhealthy. Referring to Bank Indonesia regulations regarding bank health, it can be concluded that the lower the NPL, the healthier the bank's soundness level, so that a healthy bank has increased profitability. The low value of the Non-Performing Loan (NPL) ratio will increase profitability for the company, so that the company's performance is considered good (Putrianingsih & Yulianto, 2016).

Capital Adequacy Ratio(CAR) is the ratio of capital adequacy owned by banks, so that the capital is able to cope if a loss occurs. The minimum CAR value is 9%, the higher the CAR value shows that the bank is able to handle losses, and can maintain financial stability. Capital adequacy (CAR) can determine the level of bank profitability, so that the health of the bank can be maintained (Kasmir, 2019). The capital adequacy ratio (CAR) for financial institutions in October 2020 was 23.74%, while in the month it was 24.67%. This shows that the banking capital adequacy ratio is still adequate above 9%.

Profitability is the ability of a banking company to generate profits in a certain period. The indicator used to assess banking profitability is Return on Assets (ROA), the higher the ROA value, the higher the profit (Layaman, 2016). Information from Bank Indonesia states that a healthy bank has an ROA value of greater than 1.5%. Factors that affect profitability, apart from NPL and CAR, can also be influenced by the Loan to Deposit Ratio (LDR). LDR or loan to deposit ratio is also used to assess bank liquidity, so the ideal LDR value is between 90% - 90%. Bank Indonesia Regulation No 15/15/PBI/2013 states that the minimum allowed LDR value is 79% and the maximum value is 92%. In September 2019 the LDR value in banking companies was 94, 34%, September 2020 was 93.96%, and December 2021 was 77.13%. This shows that the LDR value of banking companies in 2021 is less than ideal, so it can affect profitability. LDR is a financial ratio to assess the liquidity of a banking company, so that it can strengthen or weaken the influence of NPL and CAR.

The results of previous research conducted by Agustami & Wirekso (2013), and Nadi (2016) state that NPL has a negative effect on profitability. Research by Putri et al., (2019) and Layaman (2016) states that CAR has a positive effect on profitability. The results of the research by Suhandi (2019) and Fanny et al., (2020) state that LDR has a negative effect on profitability (ROA). Based on previous research, the authors developed a research research gap by making LDR a moderating variable using the Warpls analysis tool, while previous research used the SPSS analysis tool and there was no moderating variable. The results of this study provide an overview of banking companies that generate good profits, so that investors can make investment decisions.

LITERATURE REVIEW
2.1. Signal Theory (Signalling Theory)

Signaling theory is a theory that explains signals or signals in the form of company information to be useful for investors in making investment decisions. Brigham & Houston (2019) explains the signal theory that companies in the future will be influenced by investors who will invest. Signal theory is very important to know the positive (good) or negative (bad) signals of a company by looking at the value of financial ratios such as NPL, CAR, and LDR, because they can affect the profitability of banking companies.

2.2. Non Performing Loan (NPL)

Non Performing Loans(NPL) is a loan given by a bank to the public or customers, then the loan cannot be returned until a predetermined limit. NPL is also known as bad credit or non-performing loans. Bank Indonesia regulations stipulate that the net NPL value is 5% of the total loans disbursed. The small value of the NPL will provide profitability (ROA) to banking companies. Information from the Financial Services Authority (OJK) which is said to be problematic loans if the debtor is in the category of substandard, doubtful, and bad installment payments. Installment payments are said to be substandard, if the debtor does not pay within 90 days.

2.3. *Capital Adequacy Ratio (CAR)*

Capital Adequacy Ratio(CAR) is the ratio of capital adequacy owned by banking companies, this shows that banks must maintain existing capital to cover possible losses. The criteria for evaluating CAR are very healthy ≥ 15%, healthy 13.5% ≤ CAR <15%, moderately healthy ≤ 12% CAR <13.5%, unhealthy 9% ≤ CAR <12%, unhealthy CAR <9% . The capital adequacy ratio is obtained by comparing the value of capital and risk-weighted assets (RWA) multiplied by 100%.

2.4. Loan to Deposit Ratio (LDR)

Loan to Deposit Ratio(LDR) also known as the loan-to-deposit ratio, funds raised by banks are then distributed to the public in the form of loans. The ideal LDR value is between 90% -90%, so that it can assess whether banking liquidity is ideal or not, by comparing total deposits and loans at a certain time. LDR is the bank's ability to return withdrawn customer funds, then rely on the credit provided for its liquidity sources (Fiscal & Lusiana, 2014). Banking companies must maintain their LDR values, so that investors can see the health of the bank and make investment decisions.

2.5. *Profitability* (ROA)

Profitability is the company's ability to generate profits in a certain period. Profitability can be measured by looking at the value of Return on Assets (ROA), ROA is the rate of return to assess the profits earned in a company related to the total assets. ROA is profit generated in the past and is projected for the future (Astuti, 2015). ROA can provide business continuity carried out by banking companies.
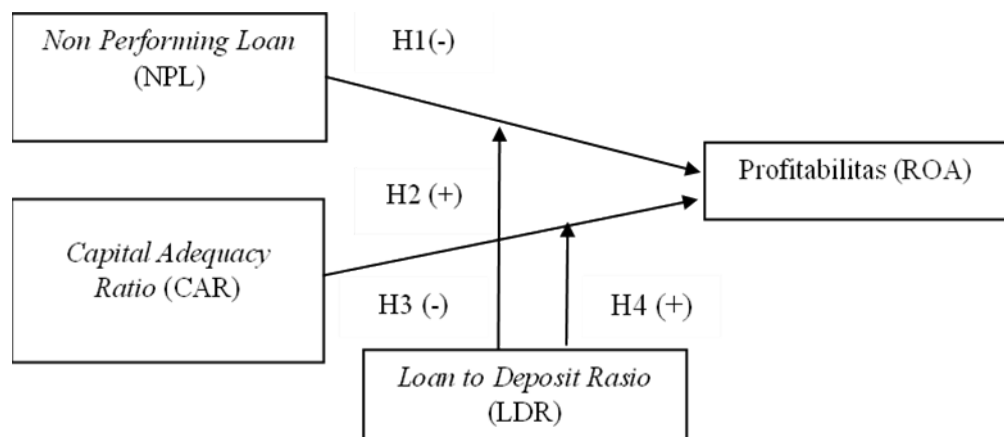

Figure 1.conceptual framework

2.6. Hypothesis Development
The Effect of Non-Performing Loans on Profitability (ROA)

Non Performing Loans(NPL) is a loan given by a bank to the public or customers, then the loan cannot be returned until a predetermined limit. NPL is also known as bad credit or non-performing loans. Bank Indonesia regulations stipulate that the net NPL value is 5% of the total loans disbursed. The small value of the NPL will provide profitability to banking companies. Research by Agustami & Wirekso (2013), and Nadi (2016) states that NPL has a negative effect on Profitability (ROA). Research results by Putri & Suhermin (2015) and Yulianah & Aji (2021) NPL has an effect on Profitability (ROA). Research by Widyastuti & Aini (2021) states that NPL has a negative effect on profitability (ROA).

Signal theory explains that cues or signals are in the form of useful information for investors in making investment decisions. The existing financial ratios reported by banking companies related to liquidity can be seen from the NPL value, so that they are useful signals or information for investors. Research by Nursyahriana et al., (2017) states that the main factor influencing NPL is a person's character. Thus, based on signal theory and previous research, the first hypothesis can be formed as follows:

H1: Non-Performing Loans Have a Negative Effect on Profitability (ROA)Effect of Capital Adequacy Ratio on Profitability (ROA)

Capital Adequacy Ratio(CAR) is the capital adequacy ratio, this indicates that the banking company must maintain existing capital to cover possible losses. The criteria for evaluating CAR are very healthy ≥ 15%, healthy 13.5% ≤ CAR <15%, moderately healthy ≤ 12% CAR <13.5%, unhealthy 9% ≤ CAR <12%, unhealthy CAR <9% . Research by Putri et al., (2019) and Layaman (2016) states that the Capital Adequacy Ratio has a positive effect on Profitability. Signal theory explains that cues or signals are in the form of useful information for investors in making investment decisions. The capital adequacy ratio (CAR) provides information relating to a company's ability to cope with losses. Thus, based on signal theory and previous research, a second hypothesis can be formed as follows:

H2: Capital Adequacy Ratio Has a Positive Effect on Profitability (ROA)

The Effect of Non-Performing Loans on Profitability (ROA) With Loan To Deposit Ratio As Moderating Variable

Loan to Deposit Ratio(LDR) also known as the loan to deposit ratio which serves to measure bank liquidity, this measurement is by comparing total deposits and loans in one period. Signal theory also explains that good information will increase the profitability of banking companies. The results of the research by Suhandi (2019) and Fanny et al., (2020) state that LDR has a negative effect on profitability (ROA), this shows that LDR can strengthen the effect of NPL on profitability. Thus, the third hypothesis can be put forward as follows:

H3: Loan to Deposit Ratio strengthens the negative effect of Non Performing Loans on Profitability (ROA)The Effect of Capital Adequacy Ratio on Profitability With Loan To Deposit Ratio As Moderating Variable

Profitability is a company's effort to earn profits in the desired period. Profitability can be measured by looking at the value of return on assets (ROA), ROA is the rate of return to assess the profits earned in a company related to the total assets. The capital adequacy ratio (CAR) shows that banking companies can meet their minimum obligations, so that the loan to deposit ratio (LDR) can moderate CAR on company profitability. Signal theory explains that cues or signals are in the form of useful information for investors to take decision to invest. This information is in the form of bank financial performance related to financial ratios in the form of LDR values. Santoso's research (2016) states that LDR has a significantly positive effect on profitability (ROA). Thus, the fourth hypothesis can be put forward as

follows:

H4: Loan to Deposit Ratio strengthens the Positive influence of Capital Adequacy Ratio on Profitability (ROA)

RESEARCH METHODS

3.1. Population and Sample

Associative quantitative research method, with secondary data using annual financial reports for the 2019-2021 period, obtained through the website www.idx.com And www.ojk.go.id. Hypothesis testing using the WarpPls 9.0 application, with the Structural Equation Modeling (SEM) approach. The research sample, totaling 23 publicly listed companies (Tbk) public private and government banks registered with the Financial Services Authority (OJK) with a sampling technique using purposive sampling.

3.2. Operational Definition of Research Variable Dependent variable (Y) Profitability (ROA)

The profitability ratio (ROA) is measured by looking at the comparison between Earning After Tax (EAT) and Total Assets. This ratio shows the extent to which a company generates profits from its assets. According to Irham (2017) the ROA formula can be in the following form:

$$ROA = \frac{Earning\ after\ tax(EAT)}{Total\ Assets}$$

3.3. Independent Variable (X1) Non Performing Loan (NPL)

The NPL ratio is measured by looking at the comparison between total non-performing loans (NPL) and total loans. According to Hamka's research (2021) the NPL formula is as follows:

$$NPLs = \frac{Total\ NPL\ x\ 100\%}{Total\ Credit}$$

3.4. Independent Variable (X2) Capital Adequacy Ratio (CAR)

The CAR ratio is measured by looking at the comparison between bank capital and risk-weighted assets (RWA). According to Putri & Suhermin's research (2015) the CAR formula is as follows:

$$CAR = \frac{Bank\ Capital\ x\ 100\%}{ATMR}$$

3.5. Moderating Variable (Z) Loan to Deposit Ratio (LDR)

The LDR ratio is measured by looking at the comparison between credit and third party funds. According to research by Putri & Suhermin (2015) the LDR formula is as follows:

$$LDR = \frac{Credit x 100\%}{third-party\ funds}$$

3.6. Analysis Method

The analytical method uses the WarpPLS application by conducting model feasibility tests (outer model and inner model) and hypothesis testing. Test the validity and reliability using the outer model, test the validity of convergent and discriminant. Convergent validity to see the relationship between latent variables and constructs. The convergent validity value reflects the value of the loading factor on the latent variable with variance through its indicators. If the loading factor value is equal to or more than 0.7 (> 0.7), then it can be concluded that it is ideal. Test discriminant validity by looking at the average variance extracted (AVE) value, if the recommended AVE value is > 0.5 or the r2 value is said to be good. The reliability test is used to see Cronbach's alpha, if the output value (output) composite reliability > 0.7, then the criteria can be concluded as reliable (Ghozali, 2019).

Ghozali & Latan (2015) stated that the inner model aims to see the correlation between latent variables. Testing the inner model by looking at the R-Square and Q-Square values. The R-Square value is at 0.70 (strong), 0.45 (moderate), and 0.25 weak). WarpPLS application hypothesis test. The hypothesis can be accepted or rejected in terms of its significance level, which is equal to 5%. If the p-value > 0.05, then the H0 decision is accepted, and vice versa if <0.05, then the H0 decision is rejected.

The structural equation hypotheses as follows:
$$Y = \beta 1X1 + \beta 2X2 + \beta 3\ ZX1 + \beta 4ZX\ 2 + \in$$

Where:

Y = ROA
β1, β2,β3, β4 = Path Coefficient X1 = NPL
X2 = CAR Z = LDR

RESULTS AND DISCUSSION

4.1. Research data

This research was conducted at public private and government open banking companies (Tbk) in the 2020-2023 period. In Table 1, the research data used is presented.

Table 1.Research Sample

No	Criteria	Total Company
1	Banking Tbk company registered with OJK for the 2020-2022 period	34
2	The Tbk company is incomplete/does not meet the criteria for the 2020-2022 period	(12)
	Sample year end observation	23
	Total research sample: (23 Companies x 3 Years)	3
		69

Source: Research Data, 2023

4.2. Convergent and Discriminant Validity Test

The convergent validity test was carried out to measure the magnitude of the correlation of latent variables with other indicators, if the factor loading value was > 0.05, then it met the convergent validity criteria, whereas if the factor loading value was <0.05, it did not meet the convergent validity criteria. The results of the convergent validity test in Table 2 show that the factor loading value for each variable is > 0.05, so that it can meet the convergent or valid validity criteria.

Table 2.AVE Convergent & Discriminant Validity Test Results

Variable Study	NPLs	CAR	LDR	Profitability (ROA)	*factor loading*	Information
X1 (NPL)	1,000	-0.030	-0.106	-0.202	1,000	Worthy
X2 (CAR)	-0.030	1,000	-0.325	0.129	1,000	Worthy
Z (LDR)	-0.106	-0.325	1,000	0.099	1,000	Worthy
Y (ROA)	-0.202	0.129	0.099	1,000	1,000	Worthy

Source: Processed Data, 2023

Discriminant validity test was conducted to measure how big the correlation between latent variables. Validity criteria discriminant is met if the average variance extracted (AVE) root value is greater than the coefficient between the latent variables. The results of the discriminant validity test in Table 2 show that the root value of AVE on one latent variable is greater than the other latent variables, so that each latent variable meets the criteria for discriminant validity.

4.3. Reliability Test

The reliability test was carried out to measure the value of Cronbach's Alpha by matching the model to each variable. A model is said to be reliable if the value of Cronbach's Alpha > 0.7. The reliability test results in Table 3 show that the Cronbach's Alpha value is above 0.7, so that all latent variables can be said to be very reliable.

Table 3.Reliability Test Results

Latent Variable	*Cronbach's Alpha*	Information
X1 (NPL), X2 (CAR), Z (LDR), Y (ROA)	1,000	Reliable

Source: Processed Data, 2023

4.4. Coefficient of Determination (R-Square) and Prediction Relevance (Q-Square)

The coefficient of determination test (R-Square) was carried out to find out what percentage the exogenous latent variable (X) correlated with the endogenous latent variable (Y). The coefficient of determination test can also provide an explanation of how much influence X has on Y by looking at the R-Square value, a strong R-Square value close to 1 or 100%. The test results for the coefficient of determination in Table 4 show that the R-Square value is 0, 26 or 26%, so that it can be explained the effect of the Non Performing Loan (X1) and Capital Adequacy Ratio (X2) variables on profitability - ROA (Y) of 26% and has a weak relationship, while 74% is explained by other variables outside the model.

Table 4.R-Square and Q-Square Test Results

Endogenous Latent Variables	R-Square	Q-Square
Y (ROA)	0.256	0.274

Source: Processed Data, 2023

Predictive relevance test (Q-Square) is conducted to find out how well the model observes. Prediction relevance is said to be good if the Q-Square observation value is > 0.05, while the Q-Square observation value is <0.05 meaning that the research model is not relevant. The results of the prediction relevance test in Table 4 show that the Q-Square value is > 0.05. This shows that the firm value endogenous latent variable can be said to be relevant (good).

4.5. Goodness of Fit (GoF)

This test is carried out to interpret the results of the hypothesis test whether it is feasible or good by looking at the value of the model fit and quality indices. The goodness of fit test results in Table 5 show that the real value of the average path coefficient (APC) model is 0.190 with a significance level of P=0.030. This shows that the fit model for each variable is said to be feasible. The real value of the VIF average block model (AVIF) of 1,760 < 5 is acceptable. This shows that the indicators of the two variables do not occur multicollinearity, in other words there is no correlation between the two variables.

Table 5.Goodness of Fit Test Results

No	Model	Fit Criteria	Real results	Information
1	Average Path Coefficient (APC)	P<0.05	0.190, P=0.030	Worthy
2	Average block VIF (AVIF)	Accepted if < 5	1,760	Worthy

Source: Processed Data, 2023

4.6. Hypothesis Test Results
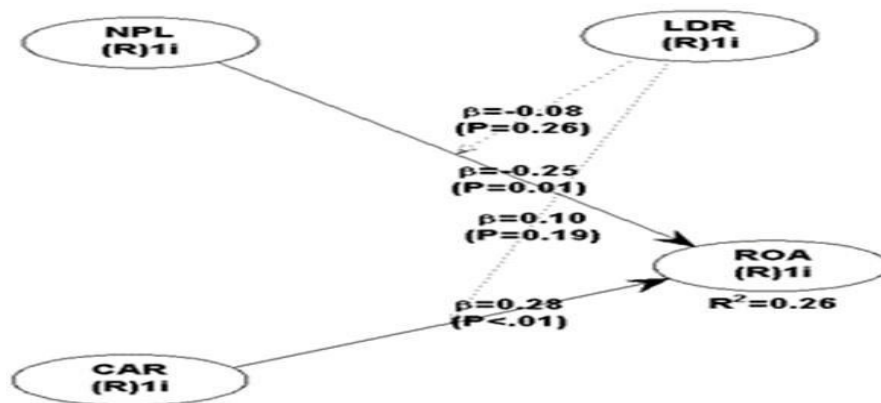
Figure 2.Path Charts

Figure 2. The path diagram shows the significance value of the hypothesis that is processed using the WarpPLS 9.0 application, so that the structural equation can be formed as follows:

$$Y = -0.25X1 + 0.29X2 - 0.09 ZX1 + 0.10ZX 2 + \in$$

Table 5.Hypothesis Test Results

hypothesis	Relationship Between Variables		Path Coefficient	*P-Value*	Information
H1	X1 (NPL)	Profitability - ROA (Y)	-0.25	0.01	Accepted
H2	X2 (CAR)	Profitability - ROA (Y)	0.29	0.01	Accepted
H3	InteractionZ X1 (LDR & NPL)	Profitability - ROA (Y)	-0.09	0.26	Rejected
H4	ZX2 interaction (LDR & CAR)	Profitability - ROA (Y)	0.10	0.19	Rejected

Source: Processed Data, 2023

The results of the hypothesis test are presented in Table 5, showing that the path coefficient value of the Non Performing Loan (NPL) is
-0.25, this explains that if the NPL increases by one unit, it will have a decreasing impact on profitability (ROA) of 0.25 units. The path coefficient value of the Capital Adequacy Ratio (CAR) is 0.29, this explains that if CSR increases by one unit, it will have an impact on increasing profitability (ROA) of
0.29 units.

The path coefficient value of the interaction between NPL and Loan to Deposit Ratio (LDR) is -0.09, this explains that if the interaction between LDR and NPL increases by one unit, it will have an impact on decreasing profitability (ROA) of 0.09 units. The path coefficient value of the interaction between CAR and LDR is 0.10, this explains that if the interaction of LDR and NPL increases by one unit, it will have an impact on increasing profitability (ROA) of 0.10 units

5.1. *Non Performing Loans***Negative Impact on Profitability (ROA)**
The results of the path diagram analysis show that the coefficient value of the non-performing loan (NPL) variable is -0.25 with a P-value of 0.01 less than 0.05. this states that the NPL variable has a significant negative effect on profitability (ROA), in other words H1 is accepted. NPL has a negative effect on ROA, this explains, if the value of the NPL ratio decreases by one unit, the profitability (ROA) increases by 0.25. Based on the signaling theory that NPL can provide information about the level of soundness of a banking company, the lower the NPL value has an impact on increasing profitability. This research is in line with the findings of Fauzia & Fadhilah, Agustami & Wirekso, and Nadi who stated that NPL has a negative effect on Profitability (ROA).

5.2. *Capital Adequacy Ratio Has a Positive Effect on Profitability (ROA)*
The results of the path diagram analysis show that the Capital Adequacy Ratio (CAR) coefficient is 0.29 with a P-value of 0.01 less than 0.05, this indicates that the Capital Adequacy Ratio variable has a positive effect on profitability (ROA), in other words H2 is accepted. CAR has a positive effect on ROA, this explains that if the value of the CAR ratio increases by one unit, then the profitability (ROA) increases by 0.29 units. Based on the signal theory that CAR can provide information about banking capital adequacy, the higher the value of the CAR ratio has an impact on increasing profitability. This study is in line with the findings of Layaman and Al-Nisa, Layaman, and Putri et al stating that the Capital Adequacy Ratio has a positive effect on profitability.

5.3. *Loan To Deposit Ratio Strengthens the Negative Influence of Non Performing Loans on Profitability (ROA)*

The results of the path diagram analysis show that the value of the moderating relationship between Loan to Deposit Ratio (LDR) and Non-Performing Loans (NPL) on profitability (ROA) is -0.09 with a P-value of 0.26, this indicates that the LDR moderation variable is not able to strengthen the negative influence of NPL on profitability (ROA), in other words H3 is rejected. This study is not in line with the findings of Suhandi and Fani et al, that LDR can negatively affect ROA

5.4. *Loan To Deposit Ratio Strengthens Positive Influence on Profitability (ROA)*

The results of the path diagram analysis show that the value of the moderating relationship between Loan to Deposit Ratio (LDR) and Capital Adequacy Ratio (CAR) on profitability (ROA) is 0.10 with a P-value of 0.19, this indicates that the NPL moderating variable is not able to strengthen the positive influence of CAR on profitability (ROA), in other words H4 is rejected. This study is not in line with Santoso, that LDR can have a positive effect on ROA.

CONCLUSION

5.5. Conclusion

The results of testing the hypothesis through the path diagram show that Non Performing Loans have a negative effect on profitability (ROA). The ROA of banking companies increases if the value of bad loans (NPL) decreases. The decline in the NPL value also gives a signal to investors to invest. The results of testing the hypothesis through the path diagram show that the Capital Adequacy Ratio has a positive effect on profitability. The company's profitability increases if the capital adequacy ratio (CAR) increases. An increase in the CAR value also gives a signal to investors that the banking company has sufficient capital in the event of liquidation, so it is safe to invest.

The results of testing the hypothesis through the path diagram show that the interaction between Loan To Deposit Ratio (LDR) and Non Performing Loans (NPL) cannot strengthen the negative effect on profitability (ROA). The results of testing the hypothesis through the path diagram show that the interaction between the Loan to Deposit Ratio (LDR) and the Capital Adequacy Ratio (CAR) cannot strengthen the positive influence on profitability. The ratio of deposits to loans (LDR) if it increases or decreases cannot strengthen the negative effect of NPL and positive effect (CAR) on the profitability of banking companies.

5.6. Suggestion

The suggestion from this study is that banking companies must reduce the NPL value and increase the CAR value. so as to increase profitability (ROA). For investors who want to invest, first look at the value of the banking company's financial ratios, especially the NPL and CAR values. If the NPL value is low and the CAR value is high, they may invest. This research still has limitations, so it suggests further research to add financial ratio variables such as Net Interest Margin (NIM), so that company profitability can provide a signal to investor.

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