The Effect of Capital Adequacy and Bank Size on Non-Performing Loans in Indonesian Public Banks

Eka Yulianti*, Aliamin, Ridwan Ibrahim

Economics and Business Faculty, Universitas Syiah Kuala, Banda Aceh, Indonesia

*Corresponding author: ekaeca@gmail.com

Abstract

Objective – This study aims to analyze the effect of capital adequacy and bank size on nonperforming loans in public banks in Indonesia for the 2012-2016 period.

Design/methodology – The secondary data used is obtained from the Financial Statements published by Bank Indonesia. This research is a hypothesis-testing study. Purposive sampling method was utilized and 81 samples constitute the final samples of this study. Multiple linear regression analysis with panel data estimation was run to test the hypotheses.

Results – The results show that simultaneously capital adequacy ratio, bank size, and loan to deposit ratio have an effect on nonperforming loans. Partially, the result shows that capital adequacy ratio has a positive effect on non-performing loans, while bank size negatively affects nonperforming loans, and loan to deposit ratio negatively affects nonperforming loans.

Research limitations/implications – This study is perhaps limited in the number of variables used to test the model. There may be other variables influencing NPL in public banks in Indonesia hence future studies may broaden the scope of this study.

Keywords Non-Performing Loans, CAR, Bank Size, Loan to Deposit Ratio.

1. Introduction

Banking as a financial intermediary institution has the main function as a credit supplier from parties who have excess funds to parties who need funds. Appropriate credit distribution will be able to provide benefits for banks based on interest difference with loans taken. Normally, banks that are able to increase lending will continue to increase profits. Banking in Indonesia generally makes income on credit interest as a source of income in financing its operations. In fact, not all of the disbursed credits are risk-free, due to the risk of improper credit repayment and loss. In Bank Indonesia Regulation (PBI) number 3/1/2011, Bank Indonesia establishes the soundness of Commercial Banks which can be assessed from bank risk profile inherently with the quality of credit risk management application implementation.

The problem of problematic credit risk is a form of the debtor's inability to pay part or all of the loan repayment given by the bank. The experience of the financial crisis that hit America in 2008-2009, caused by the existence of financial credit problems in the housing sector. Based on a review conducted by Bank Indonesia, the financial crisis that hit America and most European countries in 2008-2009 due to an aggressive increase in housing loans, while at the same time a decrease in the standard of prudence in housing loans (Indonesian Economic Outlook, 2009-2014). Conditions that occur in credit risk will have an impact on the stability of the monetary sector to the global level. The problematic credit phenomenon occurs because customers who are unable to fulfill their refund obligation, in terms of principal debt, late payment, congestion risk, and customer negligence.

Nonperforming loans describe as a situation where credit approval is a risk of failure, even tend towards a potential loss. Nonperforming loans or commonly referred to as problematic creditors can be measured based on the Non-Performing Loan (NPL) value in percentage. NPL is the ratio that compares the total non-

performing loans to total loans disbursed as a percentage. NPLs can be used as an indicator of credit risk, whereby the lower the NPL ratio, the lower the credit rate that occurs (Ali, 2004). NPL shows the ability of bank management in managing non-performing loans provided by the bank, so the higher the NPL, the worse the credit quality of the bank causing the number of non-performing loans. NPL can be influenced by three things that are an internal factor of a bank, an internal factor of a debtor, and an external factor of non-bank and debtor. Internal factors can be Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Net Interest Margin (NIM), and Operational Cost, while external factors Interest Rate (SBI), and Bank Size (BS).

Based on Bank Indonesia Regulation Number 18/14 / PBI / 2016 concerning Statutory Reserves of Commercial Banks in Rupiah and Foreign Currency for Conventional Commercial Banks, it is explained that the ratio of NPL to total credit should not exceed 5%. In order to determine the fair or healthy level, the standard size for NPL is determined. In this case, Bank Indonesia stipulates that a reasonable NPL level is ≤ 5% of its total loan portfolio. Publicly-listed Banks are among the locomotives of the national economy that support financial activity. Loan growth in commercial banks contributed to the growth of the Indonesian economy. The increasing growth in the credit sector as described in the third quarter of the Bank Indonesia Monetary Policy (2017) report is an indicator of the stability of the national financial system by maintaining the function of the bank as an intermediary institution. The following data shows the credit conditions in Indonesia in terms of their use, which are grouped into working capital NPL, investment, and consumption.
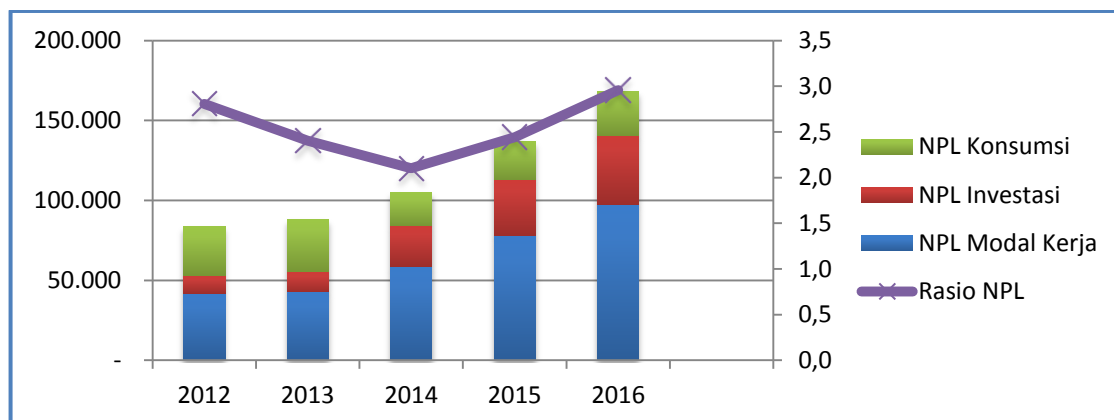
Graph 1
NPL of Commercial Banks During 2012 - August 2016 in terms of use

Source: OJK, Indonesian Banking statistics, 2018

The high level of NPL ratio indicates that the amount of credit risk borne by the bank. In graph 1, it appears that high NPLs are absorbed in the use of working capital funds. Nonperforming loans on the use of funds for working capital suffered congestion with an average uptake of 54%. Meanwhile, credit for consumption and investment tends to be small. The worrisome condition is that banks in Indonesia have a significant increase in NPLs in 2014-2016. NPL increased by 3% -5%, or an average of Rp 31.658 trillion. Increased NPL may create problem of loss in the banking sector, especially the corporate bank that affects the achievement of corporate profits due to the increasing number of problematic loans, the banks must provide greater reserves of funds so that in the end the bank's capital will be eroded. Whereas the amount of capital greatly influences the extent of credit expansion. The magnitude of NPLs is one of the causes of the difficulty of banks in distributing credit, so it needs to be examined in more in-depth research, what causes and sources of the rise of banking NPLs in Indonesia.

The increase in Non-Performing Loan (NPL) experienced by the national banking system resulted in the bank losing its ability to generate optimum profit from its

principal activities. With the increase of non-performing loans, the operating income from credit provision is very small because the interest that the bank should receive from the debtor is not fully accepted. To minimize the risk of credit problems, the bank provides funds for business development purposes and accommodates the risk of loss of funds caused by bank operations called Capital Adequacy Ratio (CAR), (Ali, 2004: 264). CAR is the capital adequacy ratio that serves to accommodate the risk of losses that may be faced by banks (Barus and Eric, 2016). The higher the CAR, the greater the ability of the bank to minimize the credit risk that occurs, meaning that the bank is able to cover the credit risk that occurs with the number of fund reserves obtained from the comparison of capital and Risk Weighted Assets (ATMR). CAR became the capital of a bank that also became a bank health indicator based on BI regulation no. 13/1 / PBI2011.

According to research conducted by Prayudi (2011), Amriani (2012), Hersugondo and Tamtomo (2012), Nugraheni et al. (2013), Astuti (2013), Ismaulandy (2014), Achir et al. (2014) that the CAR has a significant positive effect on loan growth. The results of research conducted by Astrini et al. (2014) shows that the CAR has a negative and significant impact on NPLs that occur in banking institutions listed on the IDX. In contrast to the results of research conducted by Adi Saputra (2012), Barus and Erick (2016) showed that CAR does not affect the NPL. The lower the CAR value the NPL will increase and vice versa. In this study, the decline in NPLs is due to the increasing ability of banks to assume the risk of any credit or risky earning assets.

Bank size is an important indicator in measuring assets of a bank. Company size can be measured by total assets (Barus and Erick, 2016). With large assets, banks have large volumes of credit to distribute and subsequently reduce the interest rate. The existence of such low- interest rates will facilitate credit payments that will reduce the problematic loans faced by banks. The size of a bank can be assessed from the total assets owned by the banks. Banks with large assets have the possibility to generate greater profits when followed by the results of their activities. The results of research conducted by Astrini et al. (2014) and Barus and Erick (2016) revealed that bank size has a positive and partially significant effect on NPLs. While the results of research conducted by Dewi et al. (2015) find a different result, that is bank size negatively affect Non Performing Loan. Radja (2016) in the NPL analysis with an estimated panel of commercial banks in Jordan during 2008-2012, revealed that firm size does not necessarily guarantee the non-performing of problem credit, as the result of estimation between firm size and NPL is not significant.

Loan to Deposit Ratio (LDR) is a ratio to measure the composition of the loan amount compared to the number of public funds and capital used (Kasmir, 2012). The LDR states how far the bank's ability to repay the depositors' funds withdrawals by relying on the credits given as a source of liquidity. The higher the LDR of a bank the higher the probability of problem credibility that will occur because this ratio indicates one of the bank's liquidity rating. The results of research conducted by Astrini et al. (2014) states that the LDR has a positive and partially significant effect on the NPL. While research conducted by Dewi et al. (2015) LDR negatively affect NPL.

2. Literature Review, Theoretical Framework and Hypothesis Development

2.1. *The Influence of Capital Adequacy Ratio (CAR) on Non-Performing Loan (NPL)*

Kuncoro, Mudrajad, and Suhardjono (2011: 519) explain that CAR is the capital adequacy ratio showing the bank's ability to maintain sufficient capital and the bank's management capability in identifying, measuring, controlling and controlling risks that may affect the magnitude bank capital. Taswan (2010) said that Capital Adequacy Ratio (CAR) is a comparison between the amount of capital owned by a bank with risk-weighted assets (RWA). The higher the CAR ratio indicates the bank is getting healthier by its capital. The higher the CAR value, the greater the capital held by the

bank, the amount of credit disbursed to the public will be more and more, thereby increasing the lending (Pratiwi and Hindasah, 2014).

According to research conducted by Prayudi (2011), Amriani (2012), Hersugondo and Tamtomo (2012), Ngraheni et al. (2013), Astuti (2013), Ismaulandy (2014), Achir et al. (2014) that CAR has an effect on the occurrence of Non Performing Loan. Therefore it is hypothesized that:

H1: Capital Adequacy Ratio affects Credit Problems.

2.2. The Influence of Bank Size (BS) on Non Performing Loan (NPL)

The size of the bank (bank size) is the amount of wealth owned by a bank. The size can be expressed in total assets and log size. The larger the size of the banking company also has a greater chance of increasing the risk to be borne by the bank. This happens when the assets owned by the bank are not managed and used optimally for the bank's operational activities, so the bank will potentially incur larger asset management expenses. The greater the company's assets, the more capital invested in the asset. This determination is based on the total assets owned by the company (Mulyaningsih, 2011).

The Size ratio is derived from the total assets owned by the bank in question when compared to the total assets of other banks. This variable describes assets owned by a bank. The greater the assets or assets owned by a bank the greater the volume of credit that can be channeled by the bank. The greater volume of credit provides an opportunity for the bank to reduce the spread rate, which in turn will lower the lending rate so that the bank will be more competitive in providing services to customers who need credit. Low loan interest rates can spur investment and boost economic sector improvements, while low interest rates also facilitate credit payments, thus reducing congestion rates.

According Widjaja (2009) total assets describe the ability to fund profitable investments. Utilization of an asset or asset into productive assets at a bank such as credit and others, can generate large profits also for the bank. The size of a large bank asset may be able to suppress the occurrence of problem loans. The results of research conducted by Astrini et al. (2014), and Barus and Erick (2016) revealed that the bank size has an effect on the Non Performing Loan.

H2: Bank Size has an effect on to Credit Problem.

2.3. The Influence of Loan to Deposit Ratio (LDR) on Non Performing Loan (NPL)

Loan to Deposit Ratio (LDR) is a ratio to measure the composition of the loan amount given compared to the amount of public funds and own capital used (Kashmir, 2014). LDR is the ratio between the total amount of credit or financing provided by a bank with third party funds received by the bank. The LDR value can be determined through a formula determined by Bank Indonesia through Bank Indonesia Circular Letter Number 13/30 / DPNP of 2011. Therefore, Bank Indonesia limits the Loan to Deposit Ratio as set forth in Bank Indonesia Regulation Number 19/6 / PBI / 2017 that the LDR safe limit ranges from 78% to 92%.

LDR has an important role as an indicator that shows the level of credit expansion undertaken by banks so that LDR can also be used to measure the running of bank functions as an intermediary institution. The results of research conducted by Astrini et al. (2014) states that the LDR has a positive and partially significant effect on the NPL.

H3: Loan to Deposit Ratio affects Credit Problem.

3. Research Method

This study aims to examine the effect of independent variables Capital Adequacy Ratio (CAR), Bank Size (Bank Size), and Loan to Deposit Ratio (LDR) to the dependent variable of non performing loans measured from Non Performing Loan (NPL). the

approach taken in this research is econometric quantitative analysis through panel data regression using E-Views 8.0 program. The population in this study is a Public Company Bank consisting of State-Owned Bank (state-owned enterprises), Private National Private Banks, Foreign Private Banks, and Regional Development Banks (BUMD).

Effect of Capital Adequacy

The sampling technique is done by purposive sampling method. Total population of 118 companies, while for the sample research that meets the above criteria is as many as 81 companies with span of time covering the year 2012-2016.

4. Result and Discussion

This research tests the hypotheses using multiple regression analysis method with Fix Effect Model (FEM). Multiple linear regression method connect one dependent variable with some independent variable in a research model to know whether there is influence between variable independent of the dependent variable. Multiple linear analysis is used to obtain regression coefficients which will determine whether the hypothesis made will be accepted or rejected on the basis of regression analysis results using a significance level of 5%.

The test of statistical criteria 3 includes t test (individual parameter significance test / partial test), F test (simultaneous significance test) and R2 test (coefficient of determination test). In more detail the results of estimation output can be described in the following table.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.107886	0.578226	5.374866***	0.0000
CAR	-0.012279	0.005147	-2.385513**	0.0175
BS	-0.073784	0.033489	-2.203250**	0.0282
LDR	-0.002042	0.001386	-1.473478	0.1414
R-Squared	0,10			
F-Stat	6,421***			
Prob F-Stat	0,0000			

Table 1
Summary of Estimated Results

Source: E-Views 8.0, 2018
Description: * significant at α 10% (p <0.1);
** significant at α 5% (p <0.05);
*** significant at α 1% (p <0.001).

Based on Table 1, the regression equation of CAR, BS and LDR effects on problem loans as follows.

$$NPL_{it} = 3,107 - 0,012\,CAR_{it} - 0,074BS_{it} - 0,002LDR + e_{it}$$

The results of the panel data estimation test with the FEM model resulted in a significant relationship direction across all the free variables. This means that there is a significant influence between CAR, BS, and LDR variables on non performing loans at Commercial Banks in Indonesia. Statistical criteria based on test h, t, F, and R-Squared can be explained as follows:

1) CAR variable has probability t-stat less than 5% (p-values <0,05) so Reject H0, meaning that there is significant influence between CAR variable with NPL at 95% confidence level. This influence has a negative and significant relationship.
2) Bank Size variable has probability t-stat less than 5% (p-values <0,05) so Reject H0, which means that there is significant influence between BS variable with NPL at 95% confidence level. This influence has a negative and significant relationship.
3) The LDR variable has a greater probability t-stat than the specified confidence level (90%, 95%, 99%) so as to receive H0, which means that there is no significant influence between LDR and NPL variables at different levels of trust. This

insignificant influence illustrates that between LDR and NPL there is no partially significant relationship.

4) F test, based on the test, it is found that the probability of F-statistic is less than 1% (p-value <0.01), which means that the regression model used is significant / significant or in other words together third independent variable has significant effect on the dependent variable.

5) Test R2, based on the test results obtained that the model obtained is able to explain the variation of the relationship between CAR, bank size, and LDR to NPL of 11 percent. While the rest of 89 percent is explained by other variables outside the model. This R2 value can be interpreted also as the coefficient of determination of equation model. The value of R2 seems small because it is indicated that the non-performing loans of banks are still influenced by other variables, the three proposed variables do have a significant influence but there are other factors that also affect the problematic credit banking in Indonesia.

4.1. Regression and Interpretation of Equations

The regression results that have been done on the equation model provide information about the coefficients of the independent variables against the bound variable used in this study. The coefficients then need to be interpreted to explain the effect (positive or negative) and the magnitude of the effect on the independent variable (NPL variable). For that will be explained in detail Interpretation of each variable as follows:

1) If the CAR rises by 1% then the NPL rate will fall by 0.012%, assuming that other factors outside the model are considered fixed (cateris paribus). This negative relationship indicates that if the company is able to increase CAR or capital per Weighted Assets from Risk Capital, then the bad debts can be reduced by 0.012%.

2) If the BS rises by 1%, then the NPL rate will fall by 0.074%, assuming that other factors outside the model are considered fixed (cateris paribus). This result means that when the bank is able to increase its assets, the estimated non-performing loans may decrease by 0.074%.

3) If the LDR rises 1%, the NPL level will fall by 0.002% assuming that other factors outside the model are considered fixed (cateris paribus). The influence of the relationship between LDR and NPL is not significant, due to indications that the change in LDR followed by non-performing loans has no significant effect. Based on the tabulation of LDR data performed, the ratio of the total amount of loans provided by the bank compared with funds received by banks is very diverse. The value of foreign bank lDR in Indoensia is above 100% with high data diversity. Meanwhile, NPL Value Based on Bank Indonesia provisions contained in Bank Indonesia Regulation (PBI) no. 17/11 / PBI / 2015, it is explained that the determination of LDR of general public bank is in the range of 78% -92%. Therefore, it is possible to estimate this panel data, the influence of LDR on NPL becomes insignificant.

4.2. The Effect of CAR, BS, and LDR on NPL

The results showed that the CAR, BS, and LDR simultaneously or together affected the NPL. Although all three independent variables have an effect on dependent variables, not all independent variables have a positive influence on the NPL. Based on the result of R2 test, the effect of CAR, BS, and LDR on NPL is 11%. In other words, 89% of other NPLs are influenced by other variables.

4.3. The Effect of CAR on NPL

CAR in banking becomes one of the important indicators in assessing the health/performance of banks. CAR is defined as the total capital that can be obtained by the Bank divided by Total Risk-Weighted Assets (RWA). In a number of literature explained that, CAR is the ratio of capital adequacy that serves to accommodate the risk of losses that may be faced by banks. The higher the CAR, the better the bank's ability to assume the risk of any credit or risky earning assets. If the CAR value is high then the bank is able to finance its operations and contribute substantially to profitability (Barus and Erick, 2016).

Capital is measured using Capital Adequacy Ratio (CAR). According to (Kuncoro and Suhardjono, 2002 in Setyawati, 2010) CAR is the capital adequacy that shows the bank's ability to maintain sufficient capital and the bank's management capability in identifying, measuring, controlling and controlling risks that may affect the size of bank capital.

Based on the results obtained from the estimation output using the FEM Panel data model, the CAR values of commercial banks in Indonesia have a significant effect and are able to reduce non-performing loans. This means that, when the bank is able to increase its capital adequacy ratio, it will decrease and minimize bad debts. The coefficient value of -0.012 gives meaning that CAR which can be increased by Bank equal to 1%, hence will able to decrease NPL value equal to 0,012%.

This result is in accordance with previous research conducted by Soebagio (2005), Wimboh (2004), Jusmansyah and Sriyanto (2011), Pratiwi and Hindarsah (2014), Suwarna (2014), Makri (2015), Kumala and Suryantini (2015) Astrini, et al (2014) which affirmed the negative relationship between CAR and NPL. If tracked from the Bank's financial report data on a quarterly basis, the CAR of a general company's bank is between 12% -80%. The results of this study indicate that the capital of a bank of a public company based on CAR ratio should be able to prevent the occurrence of all business risks, including non-performing loans.

Ali (2004) explains that the higher the CAR, the greater the bank's ability to minimize the credit risk that occurs so that the non-performing loans in the bank will be lower with the amount of funding reserves obtained. CAR for banks is also conducted in assessing the health of banks as a rule in accordance with the rules of Bank Indonesia Circular Letter no. 13/24 / DPNP / 2011.

The current study does not support the research conducted by Chang (2006) which states that there is a positive influence of CAR on NPL. Even Pratiwi and Hindasah (2014) with dyanamic panel analysis for the context of Indonesian commercial banks found insignificant results between the CAR and the banking credit channeling. In terms of loan disbursement, it can be found that there is a significant disparity between CAR and the amount of credit, but from the side of problem loans, most of the research reviewed has significant influence. Differences in results can also be caused because previous research took data began in 2008, where in the period 2009 occurred financial crisis that hit most of the banks around the world due to property bad loans in America.

4.4. The Effect of BS on NPL

Bank size (Bank Size) is the amount of bank asset calculated with Natural Logarithm (LN) function. Size ratio is derived from total assets owned by the bank concerned when compared to the total assets of other banks (Ranjan and Dahl in Anin Diyanti, 2012). This variable describes assets owned by a bank. The greater the assets or assets owned by a bank, the greater the volume of credit that can be channeled by the bank. Bank size is one indicator of the size or size of a bank based on total assets owned by the bank. A large bank not only has a strong total of assets, but also has the availability of funds, credit risk management and a good evaluation system.

Dendawijaya (2005) argues, the greater the volume of credit provides an opportunity for the bank to reduce the spread rate, which in turn will lower the lending rate

(loan interest rate) so that banks will be more competitive in providing services to customers who need credit. Low interest rates can spur investment and boost economic sectors. Low loan interest rates also facilitate credit payments so as to reduce the number of credit congestion (Permono and Secundatmo, 1993).

Based on the results obtained from multiple regression estimation with the FEM model, the size of the bank negatively affects the non-performing loans in the Bank of the General Company of Indonesia. Or in other words, if the bank is able to increase its assets, it will lower the level of problem loans. Coefficient value of -0.073 gives meaning that the increase of banking assets will decrease the level of non-performing loans amounted to 0.073 percent assuming other variables outside the fixed model.

These results are consistent with the research of Curak, et al (2016), Dewi and Ramantha (2015), and Suwarna (2014), Barus and Erick (2016) who found that bank size had a significant and negative effect on non-performing loans in banks. Bank size is basically an important thing in a company. This is because the bank size describes the size of a company can be shown by total assets, total sales, average sales rate and average total assets. It can be explained that when the assets of the bank of a public company increase, the problem loans may decrease. This result is obtained by examination on 82 banks of public corporations consisting of national-owned commercial banks, private banks, foreign private banks, and regional banks.

Different results were obtained in a study conducted by Barus and Erick (2016) and Risky Indrawan (2013) which concluded that the Bank size had a significant positive effect on the NPL. The value of Bank size in the linear equation is marked positive which means lower the increasing of bank asset, hence the level of problem loans also increase. This different result occurs because the study takes data from 2010-2013 which is the possibility that if the asset increases, then the number of loan disbursement will increase followed by the big risk level.

4.5. The Effect of LDR on NPL

Loan to Deposit Ratio (LDR) is a ratio to measure the composition of the loan amount compared to the amount of public funds and capital used (Kasmir, 2014). Bank Indonesia limits the Loan to Deposit Ratio level as set forth in Bank Indonesia Regulation Number 19/6 / PBI / 2017 that the LDR safe limit ranges from 78% to 92%. LDR has an important role as an indicator that shows the level of credit expansion undertaken by banks so that LDR can also be used to measure the running of bank functions as an intermediary institution.

Based on the results of the estimation, the LDR has a significant and negative effect on the NPL with the coefficient value of -0.002. The meaning is, when the bank is able to increase the LDR level as an indicator of credit expansion, then the level of risk of nonperforming loans will decrease by 0.002% assuming other variables outside the model are fixed.

The results of this study differ from the findings obtained by Astrini et al. (2014) states that the LDR has a positive and partially significant effect on the NPL. This positive influence is indicated to occur when the function of the bank as a financial intermediary institution is not performing well in its function as a credit provider, in other words, credit expansion undertakes to increase the risk of non-performing loans.

5. Conclusion

Based on the findings of this study, it can be concluded that Capital Adequacy Ratio, Bank Size, and Loan to Deposit Ratio have an effect on non performing loan at Public Bank in Indonesia. While, Capital Adequacy Ratio (CAR) positively affects non-performing loans at Public Bank in Indonesia. In addition, bank size negatively affects non performing loans at Public Bank in Indonesia, while Loan to Deposit Ratio (LDR) has a negative effect on non performing loans at Public Bank in Indonesia.

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