Non-Performing Loan Determining Factors on Buku 4 Banks Listed on the Indonesia Stock Exchange

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Abstract: *This study is conducted with the aims to analyze the influence of bank specific factors and macroeconomic factors on non-performing loan at BUKU 4 banks listed on the IDX. Quantitative analysis methods in the form of descriptive analysis and panel data regression analysis are used to analyze the data obtained in the study which covered BUKU 4 banks listed on the IDX for 2014 to 2018. The results of this study indicate that bank-specific factors that influence non-performing loans are ROA and bank size. ROA and bank size have a negative influence on non-performing loan. For macroeconomic factors that influence non-performing loans is the BI rate. The BI rate has a negative effect on non-performing loan. In this study, bank specific factors have a greater influence on non-performing loan compared to macroeconomic factors.*

Keywords: bank specific factors, BUKU 4 Bank, macroeconomic factors, non-performing loan

1. Introduction

Banks, as one of the financial institutions, have an important role in one country's economy. That role is embodied in its primary function as an intermediary institution between the parties who have excess funds and underfunded. Thus, the economic actors who need funds to run its activities can be met through the lending activity of the bank. Good risk management is needed in lending activities so as to avoid an increase in problem loans which in large amounts can affect the health of banks.

Commercial Bank Based on Business Activities (BUKU) 4 is a commercial bank with core capital of more than Rp 30 trillion. BUKU 4 Bank has a greater obligation to extend productive loans compared to other bank categories so that it has a higher risk in dealing with problem loans. If non-performing loans were not well controlled, it will have an impact on operational activities and bank revenue. In the end, it will also affect the pace of the country's economy because capital ownership and large assets owned by BUKU 4 bank dominate national economic activities.
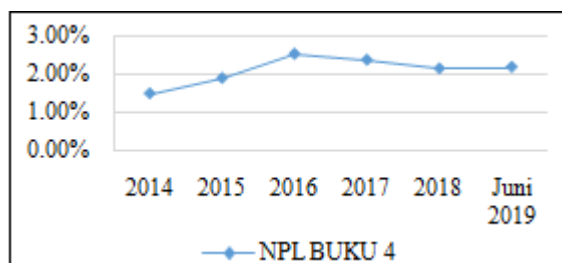

Figure 1: Development of the level of NPL at the BUKU 4 Bank
Source: Financial Services Authority of Indoensia (OJK)

Based on Figure 1, the level of Non-performing Loan (NPL) BUKU 4 Bank from 2014 until June 2019 moves fluctuatively, can be explained as follows:

a) 2016 was the period when Bank BUKU 4 experienced the highest level of NPLs during the period 2014 to June 2019.
b) In 2016, the NPL level experienced a difference of 0.65 percent increase compared to 2015.
c) In 2017 and 2018, the NPL level of Bank BUKU 4 experienced a decline but the value increased again in June 2019.
d) In the June 2019 period, NPL level reached 2.20 percent.

Non-performing loans are a measure of credit risk that is an indicator of bank health. Somoye (2010) argues that the NPL can cause a reduction in bank liquidity, credit, and a slowdown in the growth of the real sector which directly impact the financial performance of the bank.

High and low NPL level of a bank is caused by several factors, both originating from internal banks and macroeconomic factors. Naibaho research results and Rahayu (2018) showed GDP had a negative effect on the level of NPLs, so the higher the GDP, the level of NPLs will decrease. On the internal side of the bank, Aryani et al. (2016) explained that bank size has a negative influence on NPL levels. When banks have larger amounts of assets, banks will be more selective in extending credit so that they can reduce the level of NPLs.

In controlling the level of non-performing loans (NPLs), an appropriate method is needed so that the performance of commercial banks that have gone public becomes much better and encourages investors to invest. One method is to find out the dominant factors affecting NPL. This is expected to provide input on commercial bank management so as to reduce the high level of NPLs, especially when economic conditions are unstable.

This research was conducted by developing from several previous studies in order to analyze the influence of bank-specific factors and macroeconomic factors on non-

performing loans at BUKU 4 Bank listed on the IDX. Specific bank factors examined in this study include LDR, ROA and bank size as well as macroeconomic factors such as GDP, interest rates (BI rate), and exchange rates. Bank BRI, Bank Mandiri, Bank BCA, and Bank BNI are the BUKU 4 banks that will be examined in this study.

2. Literature Review

High or low NPL level is influenced by several factors, both from bank specific factors and macroeconomic factors. Bank specific factors include LDR, ROA and bank size while macroeconomic factors include GDP, interest rates and exchange rates.

2.1 Bank Specific Factors

2.1.1 Loan to Deposit Ratio (LDR)
LDR is the ratio of financing to third party funds received by banks. The minimum LDR limit set by Bank Indonesia regulations is 78 percent while the maximum limit is 92 percent. According to Riyadi (2006), the formula for measuring LDR is explained as follows:

$$LDR = \frac{Total\ Credits}{Total\ Deposits} \times 100\%$$

Barus and Erick (2016) in their research explained that LDR has a positive influence on NPL so that the higher the LDR value, the NPL value will increase.

2.1.2 Return on Asset (ROA)
ROA is a parameter used to analyze profitability ratios. According to Moussa and Chedia (2016), an increase in the ROA ratio has a negative impact on bank credit. The smaller the credit being channeled, the lower the risk of bad financing. These results are similar to the study of Sheefani (2015) which stated that there is a negative relationship between NPL and ROA. Riyadi (2006) explained the calculation of ROA as follows:

$$ROA = \frac{Net\ Income}{Total\ Assets} \times 100\%$$

2.1.3 Bank Size
Bank size is the amount of bank assets calculated by the natural logarithmic (Ln) function. According to Das and Ghosh (2007), bank size has a negative influence on NPL. The greater the size of the bank, the lower the level of NPLs it has. A larger banks certainly have more competent resources and implement better risk management strategies so as to improve the quality of their loan portfolios (Hu 2006). Bank size calculations can be written as follows (Akbar 2012):

$$Bank\ Size = Ln\ (Total\ Bank\ Assets)$$

2.2 Macroeconomic Factors

2.2.1 Gross Domestic Product (GDP)
According to Bank Indonesia, Gross Domestic Product (GDP) is the total value added generated by all business units in a country in a given period. Ahmad and Bashir (2013) stated that there is a negative relationship between GDP growth and NPL.

An increase in one's income due to GDP growth results in an increase in the ability to repay loans and reduce the NPL ratio. Calculation of GDP growth mathematically as follows:

$$GDP\ growth = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} \times 100\%$$

2.2.2 BI Rate
BI rate is the interest rate policy that describes the manner in which monetary policy is determined by Bank Indonesia and announced to the public. Curak et al. (2013) in his study stated that an increase in interest rates raises the additional burden of loans for debtors which has an impact on increasing non-performing loans. Thus, interest rates have a positive effect on NPLs. This is different from Putra and Rutriyuni's (2015) research which explains that there is a negative relationship between interest rates and NPLs. An increase in the BI rate results in an increase in lending rates, causing bank loan applications will decrease and the risk of default will reduce.

2.2.3 Exchange Rate
Exchange rates describe the exchange rate of the national currency (Rupiah) against foreign currencies (US $). Exchange rate gives a great impact on borrowers who obtain credit funds in foreign currencies and trades their products in the country with the prices using national currency. This has resulted in increased loan installments which have weighed on the debtor in completing his loans (Sutojo 2000). Therefore, it can be concluded that the more the exchange rate weakens, the debtor's ability to repay loans will be low, thereby increasing the NPL ratio.

3. Methodology

This study was conducted on four conventional banks listed on the IDX and included in BUKU 4 category from 2014 to 2018. The data used were secondary data obtained from quarterly bank financial statements, Bank Indonesia, and the Central Statistics Agency. The financial statements studied were quarterly financial reports from the first quarter of 2014 to the fourth quarter of 2018. Data analysis in this study used quantitative analysis methods in the form of descriptive analysis and panel data regression analysis.

The regression equation model in this study is:
$$NPL_{it} = \alpha + \beta_1\ LDR_{it} + \beta_2\ ROA_{it} + \beta_3 BANK\_SIZE_{it} + \beta_4\ GDP_{it} + \beta_5\ BI\_RATE_{it} + \beta_6\ EXCHANGE\_RATE_{it} + e_{it}$$

Note :
NPL_{it}	=	Non-Performing Loan
LDR_{it}	=	Loan to Deposit Ratio
ROA_{it}	=	Return On Asset
$BANK\ SIZE_{it}$	=	Ln Total Bank Assets
GDP_{it}	=	Economic Growth in Specific Periods
BI_RATE_{it}	=	Bank Indonesia Reference Interest Rate
$EXCHANGE\_RATE_{it}$	=	Rupiah Exchange Rate Against US Dollars for Certain Periods
α	=	Constant, Regression Coefficient
e	=	Error Term
i	=	Research Cross Section Data
t	=	Research Time Series Data

The hypotheses used in this study include:

H_1: LDR has a positive effect on NPL

H_2: ROA has a negative effect on NPL

H_3: Bank size has a negative effect on NPL

H_4: GDP has a negative effect on NPL

H_5: BI rate has a positive effect on NPL

H_6: Exchange rate has a negative effect on NPL

4. Result

4.1 Descriptive Analysis

Descriptive analysis conducted in this study included the amount of data (observation), the average value (average), the maximum value, the minimum value and the standard deviation. The object of research was conventional banks included in BOOK 4 from 2014 to 2018.

4.1.1 Non-performing loan (NPL)

During the period of 2014 to 2018, NPL BUKU 4 bank had an average value of 2.15 percent with a standard deviation of 0.84. Therefore, all banks observed have an average NPL value that is still below the maximum limit of 5 percent, in accordance with Bank Indonesia Regulation 13/3 / PBI / 2011 concerning the determination of the status and follow-up of bank supervision.

The maximum value of NPLs was recorded at 3.96 percent by Bank Mandiri in the fourth quarter of 2016. Debtors in the commercial segment contributed the highest non-performing loans in that period. The fall in commodity prices caused by the economic slowdown resulted in the commercial segment difficult debtors to repay their loans. On the other hand, a minimum value of 0.47 percent was recorded by Bank BCA in the first quarter 2014 period.

4.1.2 Loan to Deposit Ratio (LDR)

In 2014 to 2018, the LDR value had an average value of 85.57 percent with a maximum value of 96.74 percent that occurred at Bank Mandiri in the fourth quarter of 2018. This was due to an increase in credit growth that was not accompanied by growth in third party funds (DPK). Credit growth reached 11.8 percent while DPK grew by only 6.4 percent. The minimum LDR value of 74.49 percent was held by Bank BCA in 2017 in the second quarter. Credit disbursement by Bank BCA was not too aggressive and the growth of DPK was also contributed by the tax amnesty program carried out by the government.

4.1.3 Return on Asset (ROA)

ROA has an average value of 3.34 percent with a minimum value of 1.48 percent obtained by Bank BNI in the second quarter of 2015. The maximum value of 5.02 percent was owned by BRI in 2014 the first quarter. When compared to the 2013 quarter 1 period, ROA of Bank BRI has increased. During this period, the ROA value of Bank BRI only reached 4.76 percent.

The increase in the value of ROA of Bank BRI in 2014 quarter 1 was allegedly due to an increase in interest income. In addition, the emphasis on the amount of operating expenses had an impact on the acquisition of operating profit which was higher than the previous year. This increase in operating profit ultimately resulted in an increase in ROA.

4.1.4 Bank Size

The average value of a bank size is 20.37 percent with a maximum value of 20.93 percent and a minimum value of 19.68 percent. The maximum value of the bank size occurs at BRI Bank in 2018 fourth quarter. This is reflected in the largest total assets owned by Bank BRI compared to other BUKU 4 banks in the period amounting to Rp 1 234 200 039 (in millions). BRI's bank assets held in the fourth quarter of 2018 were dominated by the amount of loans disbursed to the public in the amount of IDR 724 495 578 (in millions).

4.1.5 Gross Domestic Product (GDP)

GDP had an average value of 1.62 percent with a maximum value of 5.07 percent. The maximum value of GDP occurred in the fourth quarter of 2017. On the other hand, the minimum value occurred in 2014 in the fourth quarter with a value of -2.07 percent.

The decline in GDP growth that occurred in 2014 was caused by several things. The slowing growth of global economic also affected the Indonesian economy, especially when China's economic growth was declining. As a trading partner, China has contributed greatly to Indonesia's export transactions. This economic slowdown caused the decline in commodity prices to a lower level for several years. Indonesia as a commodity exporting country was affected by a large enough when commodity prices are low.

In addition, the decline in GDP growth in 2014 was also influenced by Indonesian political conditions. During the 2014 legislative and presidential elections, political ambiguity occurred due to differences in the results of the voting. This caused investment and economic activity in Indonesia to slow down.

4.1.6 BI Rate

The BI rate variable had an average value of 6.06 percent with a maximum value of 7.75 percent and a minimum value of 4.25 percent. The highest BI rate occurred in the fourth quarter of 2014. In the fourth quarter of 2017, Bank Indonesia decreased the benchmark interest rate (BI rate) to 4.25 percent. This was done because banks experienced excess funds from the public.

4.1.7 Exchange Rate

Another macroeconomic variable used in research is the exchange rate. The exchange rate had an average value of 0.91 percent and a minimum value of -6.66. The maximum value of the exchange rate occurred in the third quarter of 2015 with a value of 9.88 percent. The weakening of the rupiah in 2015 was marked by a rupiah exchange rate of Rp. 14 650 per US dollar.

This was the impact of reduced foreign investment into the country due to the devaluation of the Chinese currency. The decline in foreign investment resulted in a reduction in the source of foreign exchange earnings to the foreign exchange market, resulted an excess demand for foreign exchange and ultimately depreciation of the rupiah.

4.2 Data Panel Regression Analysis

In answering the research objective, analyzing the influence of bank specific factors and macroeconomic factors on non-performing loans at BUKU 4 banks listed on the Indonesia Stock Exchange in the period 2014 to 2018, a panel data regression analysis was performed using eviews 9. The following are the results of the fixed effect regression model which is presented in Table 1.

Table 1: Results of the panel regression of factors affecting non-performing loans

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	23.04078	7.368750	3.126823	0.0026
BI_*RATE*	-0.261247	0.050510	-5.172221	0.0000
GDP	-0.007085	0.018642	-0.380026	0.7051
Exchange Rate	0.005474	0.011605	0.471676	0.6386
LDR	0.026680	0.014536	1.835442	0.0707
ROA	-0.465468	0.105072	-4.429984	0.0000
BANK SIZE	-0.983024	0.352994	-2.784820	0.0069
R-squared	0.844676	Mean dependent var		2.152000
F-statistic	42.29688	Durbin-Watson stat		0.323483
Prob(F-statistic)	0.000000			

Based on the data obtained from Table 1, the research data regression equation with the Fixed Effect Model approach is: NPL = 23.04078 + 0.026680 LDR - 0.465468 ROA - 0.983024 BANK_SIZE - 0.007085 GDP - 0.261247 BI_RATE + 0.005474 EXCHANGE_RATE + eit

Influence of LDR on the Non-Performing Loans

In this study the LDR variable has a probability of 0.0707 with a coefficient value of 0.026680 so it can be concluded that the LDR variable has no effect on non-performing loans. This is consistent with the results of Diansyah's (2016) study which stated that LDR has no influence on NPL.

It was seen that during the period of 2014 to 2018, the movement of the LDR value did not have the same effect on changes in the NPL level of BUKU 4 banks. For example, in the second quarter of 2015, Bank Mandiri LDR value decreased while the NPL level increased compared to the previous period. In the same period, Bank BRI LDR value increased and the NPL level also increased.

Influence of ROA on the Non-Performing Loans

The results of hypothesis testing indicated that the ROA variable has a probability of 0.0000 and a coefficient of -0.465468. Therefore, ROA variable has a negative effect on the level of NPL. This implies that the higher the NPL level, the lower the credit income the bank will receive, while the bank must continue to incur operational costs and will ultimately have an impact on the bank's operating profit.

The results are in line with research conducted by Alexandri and Santoso (2015) which stated that the ROA variable had a negative influence on NPL levels. ROA describes how banks manage their business to generate profits. The poor quality of bank management will cause the credit management process to not run well which will affect the high level of NPL. This is different from the study of Kumar

and Kishore (2019) who found that the ROA variable had no influence on the level of NPL.

Influence of Bank Size on the Non-Performing Loans

Bank size is the amount of bank assets calculated by the natural logarithmic (Ln) function. This variable explains the amount of assets owned by the bank. Large banks not only have a lot of total assets, but also have the availability of funds, credit risk management and a good evaluation system.

Based on hypothesis testing, the results showed that bank size variables has negative influence on non-performing loans with a coefficient of -0.983024. This means that every 1 percent increase in bank size will reduce NPLs by 0.983024 percent. The larger size of the bank certainly has more competent resources and implements a better risk management strategy so that the bank can minimize the occurrence of non-performing loans.

The results of the study are supported by research by Ranjan and Dhal (2003) which suggested that bank size had a negative effect on NPL. However, this is different from the results of Barus and Erick's (2016) research which stated that company size had a positive influence on NPL. The greater the assets owned by the company, the greater the volume of credit that can be channeled so that the impact on increasing non-performing loans.

Influence of GDP on the Non-Performing Loans

Based on the analysis using panel data regression, the GDP variable has a probability value of 0.7051 and a coefficient of -0.007085. With the results of $p > \alpha$ and $\alpha = 0.005$, the results of the analysis showed that the GDP variable had no influence on non-performing loans. The results of the study were supported by previous research conducted by Ouhiby and Hammami (2015), Vatansever and Hepsen (2013) which stated that GDP growth had no significant effect on non-performing loans.

Influence of BI Rate on the Non-Performing Loans

Based on the analysis using panel data regression, the BI rate variable has a probability value of 0.0000 and a coefficient of -0.2612. With the results of $p < \alpha$ with $\alpha = 0.005$, the results of this analysis indicated that the BI rate variable has a negative influence on non-performing loans. This means that when the BI rate increases, the level of non-performing loans decreases.

The results of this study indicate that when interest rates increase, BUKU 4 bank continues to increase lending to the public. The position of BUKU 4 Bank which has a large capital ownership makes BUKU 4 Bank has sufficient reserves of funds. If there is an increase in the BI rate, the increase in cost of funds that occurs can be mitigated by the use of reserve funds without raising credit interest rates. In theory, the value of NPL is obtained from a comparison between the number of problem loans and the total credit. Therefore, when the loan portfolio increases, the NPL value will decrease.

A negative relationship between the BI rate and non-performing loans was also found in the research of Pertiwi (2019) and Naibaho and Rahayu (2018). In their research,

Naibaho and Rahayu (2018) stated that this happened because the banks which were the study samples did write off their non-performing loans during the study period. Therefore, when the BI rate increased, non-performing loans declined.

Influence of Exchange Rate on the Non-Performing Loans

Based on the results of hypothesis testing, it is known that the exchange rate has no effect on non-performing loans. The results of this study are in line with the research of Linda et al. (2015) at PT Bank Tabungan Negara (Persero) Tbk. Changes in the exchange rate that relatively occur in the short term do not have a big impact on the debtor so that it does not interfere with the business activities it carries on. Thus, changes in exchange rates do not affect the ability of the debtor to return loans to banks. Non-performing loans do not face significant changes from the impact of changes in exchange rates.Setiyaningsih (2015) in her research stated that the exchange rate had a positive effect on NPLs, meaning that an increase in the exchange rate of the USD against the Rupiah caused an increase in the level of NPLs. The relationship between problem loans and the exchange rate can affect economic activities, especially for producers who use imported raw materials. The depreciating exchange rate causes the price of raw materials to rise, burdening production costs and ultimately affecting the amount of profit and income earned by producers.

4.3 Managerial Implications

Banking Industry

The specific bank variables studied, there are 2 variables that have an influence on non-performance loans. These variables include ROA and bank size. In respon to this, the managerial implications that need to be undertaken include the need for supervision at the ROA level in order to control the growth of the NPL level. This can be done by increasing bank revenue both interest income and non-interest income as well as reducing costs incurred. The higher the profit the bank receives, the higher the ROA level will be. Increased ROA will reduce the level of NPL

In this study, bank size was obtained from the calculation of the natural logarithmic function (Ln) of the number of assets owned by the bank. Bank size has a negative influence on non-performing loans. Therefore, banks need to manage their assets well to reduce the increase in NPLs. Bank assets, besides being obtained from loans extended to the public, also come from other sources such as cash, securities and other types of assets.

In this study, non-performing loans are influenced not only by bank-specific factors but also by macroeconomic factors, the BI rate. The BI rate has a negative effect on non-performing loans, so if the BI rate increases, the non-performing loan rate decreases. To address this, the banks still provide lending to the public but also consider the credit risk management principles despite an increase in the BI rate.

Regulators

In the case of macroeconomic factors that affect non-performing loans, the BI rate, the determination of the BI Rate conducted by Bank Indonesia as a regulator must pay attention to the state of the community's economy. The rise and fall of the BI rate will affect the ability of the debtor to return loans to banks.

5. Conclusions and Recommendations

5.1 Conclusions

a) Bank specific factors that influence non-performing loans are ROA and bank size. ROA and bank size have a negative influence on non-performing loans. The macroeconomic factor that influences non-performing loans is the BI rate which has a negative effect on non-performing loans.

b) In this study, bank specific factors have a greater influence on non-performing loans compared to macroeconomic factors. Therefore, banks need to pay more attention to bank-specific factors especially in terms of management of assets.

5.2 Recommendations

a) Non-performing loans, in addition to being influenced by bank specific factors and macroeconomic factors, are also influenced by other factors that have not been analyzed in this study. Thus, it is recommended that further research analyze other factors such as debtor internal factors.

b) In this study, the BI rate has a negative effect on NPL. Therefore further research is recommended to analyze the impact of the BI rate on NPLs in other BUKU Bank categories.

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