Analysis of The Credit Risk Determinant Using Internal Factor and Macroeconomy Data

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Abstract: This study analyzes the influence of internal bank factors and macroeconomic factors on non-performing loans (NPL) using data from the listed banks in Indonesia. We apply panel data analysis. The bank's internal and macroeconomic variables used in this study include inflation, GDP, BOPO, CAR, bank size, LDR, and ROA. The sample includes all listed banks that cover 40 banks for the period 2016 to 2021. The analysis technique uses descriptive analysis and linear regression analysis. The results of the study show that banks with a high capital adequacy ratio (CAR) own a low credit risk (NPL). While the inefficiency (BOPO) is positive and significant confirming the bad managed bank also having bad credit risk management. GDP growth has a positive coefficient but statistically not significant. Internal variables such as Bank Size, LDR and ROA are all not significant. The result confirmed that well capitalized bank take less risk and inefficient banks have bad credit risk management.

Keywords: NPL, Bank Size, Inefficiency, Go Public, Panel Data

INTRODUCTION

Banking is a very important institution in a country's economy, especially in the economic field. In carrying out its functions, funds are used to finance banking activities. Credit distribution, which is one of the main sources of bank income, does not only generate profits. Credit allocation does not rule out the possibility of credit risk that could harm the bank. If the number of non-performing loans is large, the bank bears many costs, such as backup and credit restoration costs. The size of non-performing loans is measured by the

non-performing loan (NPL) ratio.NPL is an indicator of credit risk in the banking industry. To minimize credit risk, banks carry out a lot of credit risk mitigations to reduce the high number of non-performing loans (NPL).

It should be noted that Indonesia is a country with a very high level of dependence on bank credit. Based on Indonesian banking statistics, the contribution of bank credit to total national financing is around 75%. This figure indicates that credit risk will become a significant source of financial system instability when banks fail to manage it. The financial performance of financial institutions is affected by non-performing loans (NPL) because Indonesia is a country with a financial system dominated by bank loans as the main source of financing.

From the results of previous literature research, it was found that Bank Size had a significant positive effect on NPL. According to (Pratifa & Rahmawati, 2019) and (Astrini et al., 2018). However, on the contrary, the results of the research conducted (Angel Deijeni Mamahit, 2022) state that bank size has a positive but insignificant effect.

BOPO is a measure of bank inefficiency. BOPO is calculated by comparing Operating Expenses with Operating Income or abbreviated as BOPO, it shows the level of efficiency of a bank, so that the smaller the BOPO ratio, the more efficient it is. Operational costs occur due to uncertainty regarding the bank's business. Operational activities will experience a decrease in profits which are influenced by the bank's operational cost structure and the possibility of failure of new services and products offered (Destiana, 2018). Based on research conducted (Pratifa&Rahmawati, 2019) states that BOPO has a significant positive effect. In contrast, the research conducted (Mamahit, 2022) states that BOPO has no significant negative effect, which means BOPO does not always have a significant effect.

The effect of CAR on NPL according to (Astrani et al., 2018) has a significant negative effect. On the contrary, based on research conducted (Widarjono et al., 2022) and (Alfin & Hartono, 2018) stated that CAR has a significant positive effect. Furthermore, according to (Pratifa&Rahmawati, 2019), CAR has no significant negative effect. The results above show that CAR does not always have a significant effect.

Regarding inflation, the results of previous studies showed inconsistent results. According to research (Alfin & Hartono, 2018), inflation has a positive, insignificant effect on credit risk. In contrast, the results of research conducted (Pratifa&Rahmawati, 2019) and (Nugroho et al., 2021) inflation has a significant negative effect on non-performing loans.

Credit risk is also associated with LDR. The results of research conducted by (Pratifa&Rahmawati, 2019) and (Astrini et al., 2018) state that LDR has a significant positive effect. However, research conducted (Alfin & Hartono, 2018) states that LDR has an insignificant positive effect. In contrast, the research conducted (Mamahit, 2022) states that LDR has no significant negative effect, meaning that LDR does not always have a significant effect.

Regarding ROA, focusing on the company's ability to earn earnings in bank operations. ROA is used to measure banking performance to generate profit in its operational activities. ROA is a tool to measure the effectiveness of a bank in generating profits. The higher the ROA value at the bank, the higher the profit the bank gets. This profit can be generated through owned assets. Research conducted (Alfin & Hartono, 2018) and (Widarjono et al., 2022) state that ROA has a significant positive effect on NPL.

GDP is the market value of goods and services produced in a country in a certain period. GDP can be used as a measure of a country's economic growth. The higher the GDP of a country, the better the country's economic performance. GDP as an indicator of a country's economic growth can be important to explain economic performance directly through economic actors who provide goods and services including goods and services including the banking industry. (Pratifa&Rahmawati, 2019) and (Alfin & Hartono, 2018) state that GDP has an insignificant negative effect on NPL.

The purpose of this study was to examine the effect of macroeconomic factors and bank internal factors on credit risk (NPL). This research cannot use the independent variables of inflation, GDP, BOPO, CAR, size, LDR, and ROA. The dependent variable measured is NPL. The research subject is public banking which is listed on theIndonesia Stock Exchange (IDX).

In this study, the formulation of the problem presented below is whether inflation, GDP, BOPO, CAR, BANK SIZE, LDR, and ROA affect credit risk as measured by NPL on the IDX.

Based on the background of the problems previously disclosed, the formulation of the problem in this study is:
1. Do inflation, GDP, BOPO, CAR, BANK SIZE, LDR, and ROA have a simultaneous effect on public banking that is listed on the IDX?
2. Does Inflation have a partial effect on the credit risk of in Public Banking listed on the IDX?
3. Does GDP growth partially affect credit risk in public banking that is listed on the IDX?
4. Does BOPO have a partial effect on credit risk in public banking listed on the IDX?
5. Does CAR have a partial effect on credit risk in public banking listed on the IDX?
6. Does Bank Size have a partial effect on credit risk in public banking listed on the IDX?
7. Does LDR partially affect credit risk in public banking listed on the IDX?
8. Does ROA have a partial effect on credit risk in public banking that is listed on the IDX?

LITERATUR REVIEWS

According to (Destiana, 2018) Capital adequacy ratio (CAR) is the ratio of total capital both core capital and equipment capital to Credit Risk Weighted Assets (RWA). The higher the CAR, the greater the capital owned. With large capital, credit allocation will also increase, so the risk of non-performing loans will also increase. Based on research conducted (Widarjono et al., 2022) and (Alfin & Hartono, 2018) stated that CAR has a significant positive effect. According to research (Astrani et al., 2018) states that CAR has a significant negative effect. On the other hand, (Pratifa&Rahmawati, 2019) states that CAR has no significant negative effect, which means that CAR does not always have a significant effect.

(Diana, 2018) states that in this study the efficiency level of a bank is measured by operational income operational expenses (BOPO). BOPO is calculated by comparing Operating Expenses with Operating Income or abbreviated as BOPO shows the level of efficiency of a bank, so the smaller the BOPO ratio, the more efficient. Operational costs occur due to uncertainty regarding the bank's business. Operational activities will experience a decrease in profits which are influenced by the bank's operational cost structure and the possibility of failure of new services and products offered (Destiana, 2018). Based on

research conducted (Pratifa&Rahmawati, 2019) states that BOPO has a significant positive effect. In contrast, the research conducted (Angel DeijeniMamahit, 2022) states that BOPO has no significant negative effect, which means BOPO does not always have a significant effect.

(Rosita &Musdholifah, 2018) The Loan Deposit Ratio (LDR) is a comparison between loans extended to third-party funds, and loans received, excluding subordinated loans. This ratio is an illustration of a bank's ability to pay for withdrawals made by customers by relying on loans as a source of liquidity. LDR has an important role as an indicator showing bank credit expansion so that LDR can be used to measure whether a bank intermediary function is taking place or not. Research conducted by (Pratifa&Rahmawati, 2019) and (Astrini et al., 2018) states that LDR has a significant positive effect. Research conducted (Alfin & Hartono, 2018) states that LDR has an insignificant positive effect. In contrast, the research conducted (Angel DeijeniMamahit, 2022) states that LDR has no significant negative effect, which means that LDR does not always have a significant effect.

Gross Domestic Product (GDP) is the market value of goods and services produced in a country in a certain period. GDP can be used as a measure of a country's economic growth. The higher the GDP of a country, the better the country's economic performance. GDP as an indicator of a country's economic growth can be important to explain economic performance directly through economic actors who provide goods and services including goods and services including the banking industry. Research conducted (Pratifa&Rahmawati, 2019) and (Alfin & Hartono, 2018) state that GDP has an insignificant negative effect on NPL.

Return On Equity (ROA) focuses on the company's ability to obtain earnings in bank operations. ROA is used to measure banking performance to generate profit in its operational activities. ROA is a tool to measure the effectiveness of a bank in generating profits. The higher the ROA value at the bank, the higher the profit the bank gets. This profit can be generated through the assets owned. Research conducted (Alfin & Hartono, 2018) and (Widarjono et al., 2022) states that ROA has a significant positive effect on NPL, which means that both positive and negative ROA affect NPL.

Bank Size describes the size of a bank that appears in the value of the total assets owned by the bank. High or low total assets owned can affect the level of profit obtained by a bank. Research conducted by Pratifa&Rahmawati (2019) and Astrini et al. (2018) stated that Bank Size has a significant positive effect on NPL. Meanwhile (Yulianti et al., 2018) state that bank size has no significant negative effect. In contrast, the results of the study (Angel DeijeniMamahit, 2022) state that Bank Size has a positive but not significant effect.

Inflation is an economic measure of an economic system characterized by an increase in the price of goods or services in a certain period. Inflation can also be marked by a decrease in the value of the currency in circulation. Based on research (Alfin & Hartono, 2018) inflation has an insignificant positive effect on credit risk. Meanwhile, research (Setiawan et al., 2018) states that inflation has no significant negative effect on NPL. In contrast, the results of research conducted (Pratifa&Rahmawati, 2019) and (Nugroho et al., 2021) inflation has a significant negative effect on non-performing loans, which means that inflation does not always have a significant effect.

METHOD

In this study, forecasting the level of non-performing loans is carried out using a slightly different approach from previous studies. The first step is to create a model based on an econometric approach to determine credit risk in Go public banks listed on the IDX. In this approach, bank macroeconomic and internal variables are regressed with NPL values. In the estimation process, data transformation is carried out, such as the use of logarithms and lag transformations to produce data that meets the requirements for modeling.

The linear regression approach increases the chances of producing a model that satisfies the classical assumptions. However, the classical assumptions and model requirements can be ignored if the estimation results provide the best value. In other words, modeling is used not to produce the best model but to achieve a low level of forecasting deviation. This indicates that econometric models are adopted to produce forecasts that are following existing data, even though there may be discrepancies with current econometric standards.

The macro economy includes inflation and GDP. Inflation is a comparison of the current year's consumer price index with the previous year's consumer price index from 2016 to 2021. Inflation data taken at the end of the December period is sourced from www.bi.go.id. GDP growth is a comparison of the total size of production for the current year to the total size of production for the previous year from 2016 to 2021. GDP data is sourced www.bps.go.id.

Internal banks include BOPO, CAR, BANK SIZE, LDR, and ROA. BOPO is a comparison of total operational costs to total operating income owned by banks registered on the IDX from 2016 to 2021, data sourced from the Financial Services Authority (ojk.go.id). CAR is a comparison of core capital with RWA owned by banks listed on the IDX from 2016 to 2021. Data comes from the Financial Services Authority (ojk.go.id). Bank Size is an asset that is owned for one year by banks registered on the IDX from 2016 to 2021. Data is sourced from the Financial Services Authority (ojk.go.id). LDR is the ratio of total loans granted to total DPK held by banks registered on the IDX from 2016 to 2021. Data comes from the Financial Services Authority (ojk.go.id). ROA is a comparison of profit before tax with total assets owned by banks registered on the IDX from 2016 to 2021. Data comes from the Financial Services Authority (ojk.go.id). NPL is a ratio of non-performing loans to total assets owned by banks registered on the IDX from 2016 to 2021. Data comes from the Financial Services Authority (ojk.go.id).
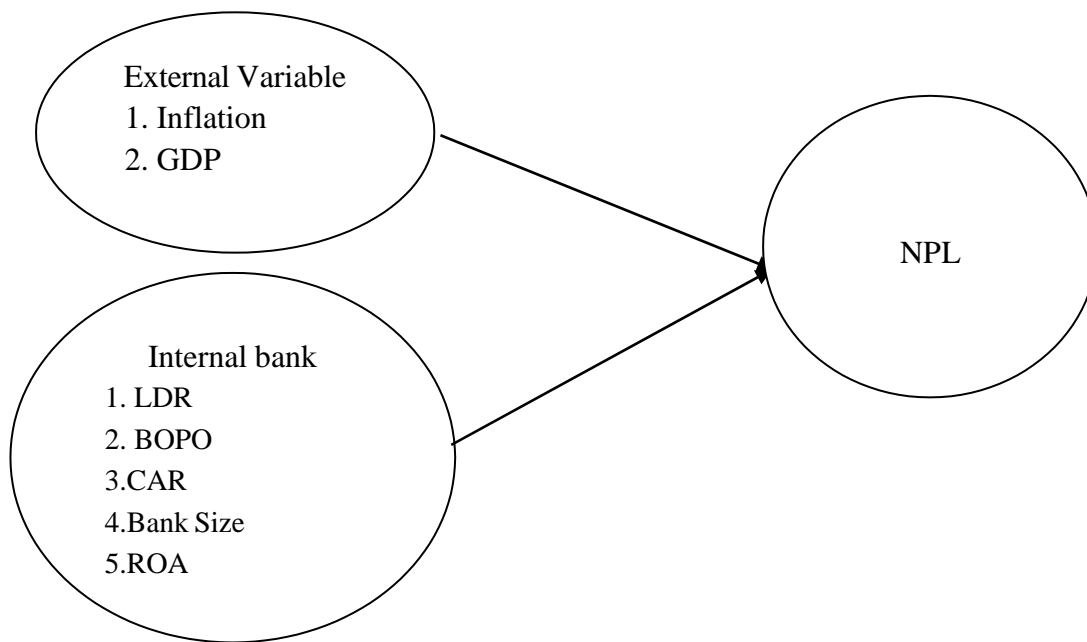
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For more details, the variables, data, and measurements in this study are explained in table 1 as follows:

Table 1. Identification and Measurement of Variables

Variable	Definition	Measurement	sources
NPL (Y)	Non-Performing Loans	Non-performing loans/total credit disbursed	FSA
INFLATION (X_1)	Consumer Price Index	Consumer price index	BPS
GDP (X_2)	Gross Domestic Product	Total production of goods and services	BPS
BOPO (X_3)	Operating Expenses To Operating Income	Total operating costs/total operating income	FSA
CAR (X_4)	Capital adequacy ratio	Capital / Assets Weighted by Credit Risk	FSA
BANK SIZE(X_5)	Banksize	Total assets	FSA
LDR (X_6)	Loan To Deposit Ratio	third party credit/funds	FSA
ROA (X_7)	Return On Equity	Profit before tax/total assets	FSA

Source: OJK/Financial Service Authority (FSA), Statistic Office (BPS)

Statistic analysis

Data analysis techniques used in this study include descriptive and statistical analysis. Descriptive research has the aim of explaining the nature or characteristics of a symptom,

event, or event that is happening at this time (Noor, 2017: 111) while statistical analysis is used to prove the research hypothesis by analyzing data using multiple linear regression the steps are:

a. Multiple linear regression analysis

Multiple linear regression analysis is used to determine the direction and the magnitude of the influence of the independent variables on the dependent variable using the multiple linear regression formula as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + e i$$

b. Simultaneous Test (F-Test/ Annova)

The F test is used to determine whether or not all independent variables influence the dependent variable (Ghozali, 2018: 98). The test steps are as follows:
Determine the null formula and test the hypothesis

H_0 : $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$, means that all independent variables (Inflation, GDP,

BOPO, CAR, Bank Size, LDR, and ROA) together have an insignificant effect on the dependent variable, namely NPL (Y).

H_1 : $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0$, means that all independent variables

consisting of (Inflation, GDP, BOPO, CAR, Bank Size, LDR and ROA) together have a significant effect on the NPL variable (Y). The Panel Data Regression Method provides estimation results that are Best Linear Unbiased Estimation (BLUE) if all Gauss Markov assumptions are met including non-autcorrelation.

In the regression model estimation method using panel data can be done through three approaches:

1. Common Effect Model or Pooled Least Square (PLS). This is the simplest panel data model approach because it only combines time series and cross section data. This model does not pay attention to the time or individual dimensions, so it is assumed that the behavior of company data is the same in various time periods. This method can use the Ordinary Least Square (OLS) approach or the least squares technique to estimate the panel data model.

2. Fixed Effect Model (FE). This model assumes that the differences between individuals can be accommodated from the intercept differences. To estimate the Fixed Effects panel data model using the dummy variable technique to capture differences in intercepts between companies, differences in intercepts can occur due to differences in work culture, managerial and incentives. However, the slopes are the same between companies. This estimation model is often also called the Least Squares Dummy Variable (LSDV) technique.

3. Random Effect Model (RE). This model will estimate panel data where the disturbance variables may be related to each other over time and between individuals. In the Random Effect model, the difference in intercepts is accommodated by the error terms of each company. The advantage of using the Random Effects model is that it eliminates

heteroscedasticity. This model is also called the Error Component Model (ECM) or the Generalized Least Square (GLS) technique.

T-TEST:

The t-test is used to determine whether the independent variable partially affects the dependent variable. The t-test basically shows how far the independent variables affect the dependent variable (Ghozali, 2018:99). The test steps are as follows:

The T-test is used for independent variables that influence NPL. This analysis is used to test whether the variables Inflation, GDP, BOPO, CAR, Bank Size, LDR, and ROA partially affect NPL.

Chow Test

The Chow test is used to determine the best model between the Common Effect Model (CEM) or Fixed Effect Model (FEM) in the panel data analysis. The basis for decision making is when the value of the probability cross section $F > 0.05$, then the model chosen is the Ordinary least square (ols) or common effect approach. In opposite, the selected model is the fixed effect approach.

Hausman Test

The Hausman Test is a test used to determine the best method between the fixed effect or the random effect in the panel data. The conclusion is when p value <0.05 then we decided to use the fixed effect. In opposite, if p value > 0.05 then the method should be the random effect.

RESULTS

Table 2. Statistical Descriptive Test

Variable	Obs	Mean	Std. Dev.	Min	Max
NPL	240	3.561	2.723	0.005	22.27
INFLATION	240	2.671	0.689	1.68	3.61
GDP	240	3.653	2.612	-2.065	5.174
BOPO	240	96.126	32.881	51.7	287.86
CAR	240	25.973	18.642	8.00	169.92
LASET	240	17.456	1.811	13.407	21.176
LDR	240	86.908	52.835	82.00	761.45
ROA	240	0.571	2.964	-15.89	11

Based on table 2, it can be seen that the NPL has an average of 3,561 with a standard deviation of 2,723, a minimum of 0, and a maximum of 22.27. Inflation has an average of 2,671 with a standard deviation of 0,689 a minimum of 1.68 a maximum of 3.61.GDP has an average of 3,653 with a standard deviation of 2,612 min -2,065 max 5,174. BOPO has an average of 96.126 with a standard deviation of 32.881 min 51.7 max 287.86. CAR has an average of 25,973 with a standard deviation of 18,642 min 8.00 max 169.92. Bank size has an average of

17,456 with a standard deviation of 1,811 min 13,407 max 21,176. LDR has an average of 86,908 with a standard deviation of 52,835 min 0.82 max 761.45. ROA has an average of 0.571 with a standard deviation of 2.964 min -15.89 max 11.

Table 3. Correlation Test

	NPL	INFLAL-ION	GDP	BOPO	CAR	LASET	LDR	ROA
NPL	1.000							
INFLATION	-0.018	1.000						
GDP	-0.024	0.763	1.000					
BOPO	0.416	-0.121	-0.076	1.000				
CAR	-0.075	-0.160	-0.052	0.205	1.000			
LASET	-0.217	-0.080	-0.041	-0.418	-0.316	1.000		
LDR	0.040	0.104	0.059	-0.013	0.236	-0.077	1.000	
ROA	-0.341	0.085	0.026	-0.910	-0.203	0.388	0.017	1.000

Source : Results of stata

Based on table 3 from the results of the correlation test with the dependent variable and the independent variable used in this study, the first is inflation to NPL with a correlation value of -0.01%. GDP to NPL with a correlation value of -0.02%. BOPO to NPL with a correlation value of 0.41%. CAR to NPL with a correlation value of -0.07%. Bank size to NPL with a correlation value of -0.21%. LDR to NPL has a correlation value of 0.04%. ROA on NPL has a correlation value of -0.34%. Reffering to Table 3, the results of the correlation test values shows that there are two variables produce positive values, namely the BOPO and LDR variables. Conversely, five variables produce negative correlation values, namely Inflation, GDP, CAR, Bank size, and ROA.

Table 4. Fitness of the Model

Indicator	OLS	FE	RE
R-Sq	23%	11%	22%
anova	9.69	3.22	43.18
RMSE	2.43	2.10	2.11

Source : Results of stata

Based on table 4, it can be seen from the modeling results that the ANOVA values for Degrees of Freedom are 7 and N 232. The R-squared result is 0.223 indicating a strong relationship between the independent variables and the dependent variable.

Table 5. Multiple Linear Regression

Variable	OLS	Panel Regression	
		Fied Effect (FE)	Random Effect (RE)
Inflation	-.120	-.407	-.1878
GDP	.195***	.175***	.195***
BOPO	.0014***	.0036***	.0014**
CAR	-.0062***	-.0022***	-.0062***
LASET	-.0502**	-.743***	-.0502**
LDR	.0011	4.8e-04	.0011
ROA	.0053	-.0046	.0053
_cons	3.03***	15.4***	3.03***

Source: Results of stata

Based on table 5 the results of the multiple regression using OLS, Panel Fiexed Effect (FE), Panel Random effect (RE) is presented. there are several variables owning a significant effect on NPL. The output results that have a significant effect are BOPO and CAR. BOPO has a significant value of 0.00 <0.05 with a coefficient of 0.049 meaning that BOPO has a significant positive effect on NPL. CAR has a significant value of 0.001 <0.005 with a coefficient of -0.031, which means CAR has a significant negative effect on NPL. Based on the various test, we reject the OLS. Based on Breusch-Pagan / Cook-Weisberg test for heteroskedasticity, we find Chi-squared 270.05 ad significant at 1%. Base on Hausman Test, we test the best model whether FE or RE. Base on Chi-Square is 16.02 and significant at 0.0250. We decided the model is Fixed Effect (FE).

DISCUSSION

This section discusses the results of the research and explains the results that have been analyzed to answer research questions. The following are the results of research that has been examined.

Effect of Inflation on NPL

The inflation variable shows no significant negative effect on NPL where the P value is 0.757 > 0.05 with a coefficient value of -0.407, the results on the negative NPL variable are not significant. Based on these results, it means that inflation reduce credit risk. As most of loan used for roductive pupeses, inflation in general incrase the price. For producers, price increase mean higher income Increased inflation will reducee non-performing loans. The theory is in line with research (Setiawan et al., 2018) which states that inflation has no significant negative effect on NPL. Meanwhile, the results of this study are contrary to the results of a research according to (Pratifa&Rahmawati, 2019) and (Nugroho et al., 2021) stating that inflation has a significant negative effect on NPL.

Effect of GDP on NPL

The GDP variable shows no significant positive effect on NPL where the P value is 0.0257 > 0.005 with a coefficient value of 0.175. The results on the positive NPL variable are

not significant. Based on the current economic results in Indonesia, economic growh is positive due to export. During the Covid-19, GDP to decline. This theory is in line with the results of research conducted (Alfin & Hartono, 2018) stating that GDP has a positive but not significant effect. There is procyclicality effect in Indonesia. While the results of this study are contrary to the results of a research according to (Pratifa&Rahmawati, 2019) which states that GDP has no significant negative effect on NPL.

The effect of BOPO on NPL

The BOPO variable shows a significant positive effect on NPLs where the P value is 0.001 <0.05 with a coefficient value of 0.0036. The results show that BOPO has a significant positive effect. Based on these results, it shows that the smaller the BOPO ratio (more efficient bank), the smaller credit risk and so the problematic conditions. This theory is supported by research results (Pratifa&Rahmawati, 2019) stating that BOPO has a significant positive effect on NPL. Meanwhile, the results of this study are in contrast to the results of research by (Angel DeijeniMamahit, 2022) stating that BOPO has no significant negative effect on NPLs.

Effect of CAR on NPL

The CAR variable shows a significant negative effect on NPL where the P value is 0.001 with a coefficient value of -0.0022 based on these results showing a significant negative effect on NPL. Funds are important in bank operational activities. So the higher the CAR, the greater the bank's ability to minimize the risks that occur so that the problem loans that occur in the bank will be lower. CAR has a significant effect on NPL. This theory is supported by research results (Astrini et al., 2018) which state that CAR has a significant negative effect on NPL. While the results of this study are in contrast to the results of research by (Alfin & Hartono, 2018) and (Widarjono et al., 2022) stating that CAR has a significant positive effect on NPL.

Influence of Bank Size on NPL

The Bank Size variable shows no significant negative effect where the P value is 0.0107 < 0.005 with a coefficient of -0.743 the results show no significant negative effect on NPL. Bank Size is basically the most important thing in a bank. This is because the size of a bank describes the scale of the operation of a bank and measured vy using various indicators such as total assets, bank size, stock market value, number of sales, the average level of sales, and average total assets channeled by the bank. This theory is not supported by research results (Yulianti et al., 2018) which state that Bank Size has no significant negative effect on NPL. Meanwhile, the results of this study contradict the results of research by (Astrini et al., 2018) and (Pratifa&Rahmawati, 2019) stating that Bank Size has a significant positive effect on NPL.

The effect of LDR on NPL

The LDR variable shows no significant positive effect where the P value is 0.0232 > 0.005 with a coefficient of 0.0048. These results show no significant positive effect on NPL. This ratio is an illustration of a bank's ability to pay for withdrawals made by customers by relying on loans as a source of liquidity. This shows that the higher the credit given, the higher the credit risk that occurs at the bank and vice versa. This result is supported by the results of research conducted (Alfin & Hartono, 2018) stating that LDR has an insignificant positive

effect. In contrast, the results of research conducted by (Angel DeijeniMamahit, 2022) state that LDR has a negative but not significant effect on NPL. Meanwhile, the results of this study are in contrast to the results of research conducted by (Astrini et al., 2018) and (Pratifa&Rahmawati, 2019) stating that LDR has a significant positive effect on NPL.

Effect of ROA on NPL

The ROA variable shows an insignificant positive effect with a P value of 0.161 > 0.001 with a coefficient value of 0.0046 based on these results showing an insignificant positive effect on NPL. ROA is one of the assets owned by a bank, namely credit. ROA is a tool to measure the effectiveness of a bank in generating profits. The higher the ROA, the higher the profit earned which indicates high-paying ability. The results of this study are in line with research conducted (Widarjono et al., 2022) which states that ROA has a significant positive effect on NPL. While the results of this study are contrary to the results of research by (Alfin & Hartono, 2018) stating that ROA has a significant negative effect on NPL.

CONCLUSIONS

This study analyzes the determinants of credit risk (NPL) at publicly listed banks listed on the IDX. There are 240 bank samples for the period 2016 to 2021. From the results of the descriptive analysis, it is found that the average credit risk (NPL) is 3.56% with a maximum of 22.27%. There is a sample whose credit risk is close to 0% indicating the excellent of credit risk management.

The results of the analysis using linear regression found that credit risk is affected by inefficiency (BOPO). This means that banks with high levels of inefficiency tend to have very high levels of credit risk (NPL). These results indicate that bad bank management tends to produce bad credit risk. As for capital (CAR), it was found that banks with high capital adequacy ratios had low credit risk. It indicates that well capitalized bank takes less risk to safe the capital. Other variables such as GDP had a positive and significant effect. Bank Size showed a negative and significant, and LDR and ROA were not significant. In general, banks are less sensitive to macroeconomic variable changes.

This study implies that bank management in general is very important in making banks low credit risk. Meanwhile, banks with high capital adequacy tend to take low risks so they have a low level of credit risk (NPL).

Acknowledgments

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