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Analysis of Macroeconomic Determinants and Banking Performance on Non-Performing Loans of Regional Development Banks in Indonesia

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ABSTRACT

The objectives of this research is to analyze the effect of macroeconomic and bank performance determinants toward Non Performing Loans (NPL) of Regional Development Banks (BPD) in Indonesia during the period 2020-2021. The objects of this research are 26 Regional Development Banks. Macroeconomic variables that are used are regional economic growth and inflation. Then bank performance variables that used are Loan to Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), and loan growth This research uses panel data regression analysis method and goodness of fit test (t test, F test, and R-squared test). Based on the result of model selection test by using Hausman test, Random Effect Model is the appropriate model for this research. The estimation result shows that simultaneously regional economic growth, inflation, LDR, CAR, and loan growth have significant effect to NPL. Partially, only loan growth has significant effect to NPL with negative association. Meanwhile, regional economic growth, inflation, LDR, and CAR have no significant effect to the NPL of Regional Development Bank (BPD) during the period 2020-2021.

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1. INTRODUCTION

As a financial intermediary institution, banks have an important role in improving the economic level of a country. According to Kasmir (2012: 2) banks can be said to be the blood of a country's economy. The more developed a country, the greater the role of banks in controlling the country. This means that the existence of the banking world is increasingly needed by the government and its people. In the Indonesian banking system, Regional Development Banks have a fairly important role as an intermediary institution operating within the scope of Level 1 Regions and surrounding areas (Yanti, 2012). Through lending activities, Regional Development Banks (BPD) can become a driving force for regional development which will then have an impact on increasing regional economic growth. Currently in Indonesia there are 26 Regional Development Banks spread across

various provinces. Regional Development Banks had a fairly good development during the 2011-November 2016 period. In November 2016 the total assets of Regional Development Banks throughout Indonesia were recorded at Rp. 546.89 trillion or grew by 55.59% from 2011. collected was recorded at Rp. 431.35 trillion or grew by 54.56% from 2011 and total loans disbursed were recorded at Rp. 357.52 trillion or grew by 49.14% from 2011. (Indonesian Banking Statistics, 2016).

According to Alexandri and Santoso (2015) NPL is one of the indicators used in assessing the performance of banks as intermediary institutions. Panggabean (2012) states that a commonly used measure of credit quality is non-performing loans (NPL) or non-performing loans. Currently, the NPL of the Regional Development Bank is still in a good position. This can be seen from the NPL of Regional Development Banks which are still below the maximum limit of 5% determined by Bank Indonesia. Based on Figure 1.1, it can be seen that the NPL of Regional Development Banks is experiencing an increasing trend. In 2011, the NPL ratio of Regional Development Banks was recorded at 1.75%. This then continued to increase until in November 2016, the NPL of the Regional Development Bank was recorded at 3.75%. In this study, external factors are represented by macroeconomic conditions of a country or region using regional economic growth (GRDP) and inflation variables. Meanwhile, internal factors which are represented by banking performance use Loan to Deposit Ratio (LDR) variables, Capital Adequacy Ratio (CAR), and Loan Growth (Loan Growth). The increase in regional economic growth as reflected by the increase in GRDP indicates an increase in the income of the community and companies, which in turn will have an impact on their ability to pay debts (credit) which increases. This will then have an impact on the decline in NPL. On the other hand, when there is an economic slowdown which is reflected by a decrease in GRDP, it shows that the income of the community and companies decreases.

Inflation is a tendency to increase the price of goods and services in general which takes place continuously. Loan to Deposit Ratio (LDR) is a ratio that describes the ratio between the amount of credit disbursed and the amount of public funds collected (DPK). A high LDR means that there is a high credit distribution as well. Thus the potential for non-performing loans or NPLs will be high as well. So, the higher the LDR of a bank, the higher the NPL. The Capital Adequacy Ratio (CAR) shows how far all bank assets that contain risks (credit, securities, etc.) are also financed from the bank's own capital in addition to obtaining funds from sources outside the bank. The higher the capital owned by the bank, the easier it will be for the bank to finance assets that contain risk (credit). Vice versa, if credit growth is not accompanied by sufficient capital, it will potentially lead to non-performing loans or NPLs. Therefore, it is assumed that the relationship between CAR and NPL is negative. The objectives of this research are:

1. To determine the effect of GRDP growth on the NPL of Regional Development Banks.
2. To determine the effect of inflation on the NPL of Regional Development Banks.
3. To determine the effect of LDR on the NPL of Regional Development Banks.
4. To determine the effect of CAR on the NPL of Regional Development Banks.
5. To determine the effect of credit growth on the NPL of Regional Development Banks.

2. RESEARCH METHOD

2.1 Type of Research, Place and Time of Research

The type of research used in this research is descriptive quantitative research and associative research. This research was conducted in Indonesia with the selected research object is the Regional Development Bank (BPD). The population of this research is 26 Regional Development Banks. The time used for this research is from 2011 to 2015.

2.2 Operational Limits

The operational limitations of this research are:

a. The variables used in this study are divided into two parts, namely:
   1) The dependent variable (Y) in this study is Non-Performing Loan (NPL).
   2) The independent variables (X) in this study are GRDP growth, inflation, Loan to Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), and loan growth.

b. The test is carried out using one dependent variable, namely NPL with five independent variables, namely regional economic growth (GRDP), inflation, Loan to Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), and loan growth (loan growth). using panel data.
c. The object of this research consists of 26 (twenty six) Regional Development Banks.
d. This study uses data, namely the BPD annual report published on each BPD official website from 2011-2015 as well as regional macroeconomic indicator data obtained from the Central Statistics Agency.

2.3 Operational Definition and Variable Measurement Scale

a. Dependent Variable (Bound)

The dependent variable in this study is NPL. NPL is a proxy for credit risk. In this study, the NPL used is gross NPL. Gross NPL is the portion of the number of non-performing loans over the number of loans disbursed by banks expressed in percent (%). The data is obtained from the financial statements of the Regional Development Banks in the form of annual data from 2011-2015.

b. Independent Variable (Free)
   1) Regional Economic Growth (X1)
   2) Inflation (X2)
   3) LDR (X3)
   4) CAR(X4)
   5) Credit Growth (X5)

c. The population used in this study was 26 Regional Development Banks during the period 2011-2015. While the sampling technique used was purposive sampling with the established criteria as follows:
   1) Regional Development Banks that publish annual financial reports for the period 2011-2015.
   2) Province of each Regional Development Bank which has data on GRDP and Inflation growth during the 2011-2015 period.

d. Data Types and Sources

The type of data used in this research is secondary data. This data is in the form of annual data starting from 2011 to 2015. The source of the data used in this study was obtained from the annual report. In this study, panel data is used which is a combination of time series and cross section data. Time series data usually includes one object but covers several periods, while cross section data consists of several or many objects, often called respondents or companies with several types of data in a certain period.

e. Method of collecting data

In accordance with the type of data needed in this research, namely secondary data, the data collection methods used are library research methods and documentation methods

f. Analysis Techniques

The data analysis techniques in this study are as follows:
   a) The data analysis techniques in this study are as follows:
   b) Panel Data Regression Analysis

The panel regression model formed in this research is:

$$\text{NPLit} = \alpha + \beta 1\text{GDRPit} + \beta 2\text{INFit} + \beta 3\text{LDRit} + \beta 4\text{CARit} + \beta\text{LGIT} + \text{eit}$$

Information:

?	= Non-Performing Loan
□	= Constant
1- 5	= Regression coefficient
GDP	= Regional Economic Growth
INF	= Inflation
LDR	= Loan to Deposit Ratio
CAR	= Capital Adequacy Ratio
LG	= Credit growth (Loan Growth)
e	= error term

c) Panel Data Modeling

There are three approach models that can be used to estimate the regression model with panel data, namely:

a) Pooled Least Square / Common Effect Model
b) Fixed Effect Model
c) Random Effect Model

The model determination test is only intended for the fixed effect model and the random effect model using the Hausman test.

1) Hausman Test (Hausman Test)

The hypotheses that arise in the Hausman test are:

Ho: Random effect is the right model and Ha: Fixed effect is the right model

d) Goodness of Fit Panel Data Regression Model

To test the effect of the independent variable (X) on the dependent (Y) can be done with a partial significance test (t statistical test), simultaneous significance test (F statistic test) and the coefficient of determination test (R2).

a) Partial Significance Test (t-Statistical Test)

This test can be done by comparing the t-count value with the t-table or by looking at the significance column for each t-count. The formula of the hypothesis formed in this research is:

1) Ho1: There is no significant effect between LDR on the NPL of the Regional Development Bank. And Ha1: There is a significant effect between LDR on the NPL for Regional Development.
2) Ho2: There is no significant effect between CAR on the NPL of Regional Development Banks. And
3) Ha2: There is a significant effect between CAR on the NPL of Regional Development Banks.
4) Ho3: There is an insignificant effect between credit growth on the NPL of Regional Development Banks and Ha3: There is a significant effect of credit growth on the NPL of Regional Development Banks.
5) Ho4: There is an insignificant effect of regional economic growth (PDRB) on the NPL of Regional Development Banks and Ha4: There is a significant effect of regional economic growth (GRDP) on the NPL of Regional Development Banks.
6) Ho5: There is an insignificant effect between inflation on the NPL of Regional Development Banks and Ho5: There is an insignificant effect of inflation on the NPL of Regional Development Banks.

b) Simultaneous Significance Test (F Statistics Test)

The formula for the hypothesis in this study is:

Ho6: There is an insignificant effect between LDR, CAR, credit growth, regional economic growth (GRDP), and inflation on the NPL of Regional Development Banks and Ha6: There is a significant effect between LDR, CAR, credit growth, regional economic growth (GRDP), and inflation on the Bank's NPL Regional development.

c) Coefficient of determination test (R2)

The coefficient of determination is basically to measure the correctness of the regression model. The value of R^2 lies between 0 to 1 (0 R^2 1). If the value of R^2 is closer to one, the better the regression model, meaning that the ability of the independent variables (LDR, CAR, credit growth, GRDP growth, and inflation) to provide almost all the information needed to predict the dependent variable (NPL).

3. RESULTS AND DISCUSSIONS

3.1 Descriptive Analysis

The following is a table of descriptive statistics for all variables used in this study.

Table 1 Descriptive Statistics

	mean	median	Maximum	Minimum	Std. Dev.
NPL	0.02205	0.0158	0.0963	0.0015	0.018652
GDP	0.05888	0.06005	0.2124	-0.0428	0.027658
INF	0.05749	0.0522	0.1158	0.0022	0.023757
LDR	0.89304	0.8923	1.2843	0.4791	0.1406
CAR	0.19656	0.1838	0.3838	0.0937	0.053083
LG	0.19671	0.18361	0.7428	-0.0902	0.123195

From the table above, each variable can be described that indicates that the data for each variable during the 2011-2015 period is normally distributed.

3.2 Hausman Test (Hausman Test)

Table 2 Hausman test

Test Summary	Chi-Sq. Statistics	Chi-Sq. df	Prob.
0.5097	0.5097	0.5097	0.5097

Based on the results of the Hausman test, the Chi-Square Statistics value is 4.280746 while the Chi-Square table value with df = 5 at = 5% is 11.07. This means that Chi-Square Statistics < Chi-Square table (4.280746 0.05. So Ho is accepted, which means that the Random Effect Model (REM) model is a suitable model for the estimation of equations in this study.

3.3 Estimation Results of Panel Data Regression Model

The following is a table of panel data regression estimation results using the Random Effect Model approach:

Table 3 Random Effect Model Estimation Results

Variable	Coefficient	Std. Error	t-Stats	Prob.
c	0.019503	0.011096	1.75763	0.0813
GDP	0.007425	0.047128	0.157559	0.8751
INF	-0.005403	0.048636	-0.111086	0.9117
LDR	0.014636	0.010244	1.428783	0.1556
CAR	0.002867	0.034647	0.082734	0.9342
LG	-0.057014	0.009845	-5.791409	0.0000
Random Effects (Cross)				
ACEH—C	0.000696	MALUKUMALUT--C		0.000526
BALI—C	-0.013627	NTB—C		-0.006602
BENGKULU—C	-0.012214	NTT—C		-0.007171
DKI—C	0.021003	PAPUA—C		0.023188
JAMBI—C	-0.013095	RIAUKEPRI--C		0.006185
_CENTRAL	-0.009435	SULTRA—C		0.010289
JAVA—C				
BJB—C	0.005024	SULSELSULBAR--C		-0.016311
JATIM—C	0.006145	SULTENG—C		0.019336
KALTIM—C	0.001167	SULUTGO—C		-0.010589
COAST—C	-0.01356	W Sumatra—C		0.00047
KALBAR—C	-0.016782	SUMSELBABEL--C		0.027997
KALSEL—C	0.005908	SUMUT—C		0.012000
LAMPUNG—C	-0.012169	DIY—C		-0.008381
R-Squared		0.229907		
Adjusted R-Squared		0.19885		
F-Statistics		7.403876		
Prob(F-Statistic)		0.000004		

Based on the estimation results of the Random Effect Model listed in Table 3.3 above, it can be seen that the panel data regression equation model in this study is as follows:

NPLit= 0.0195 +0.00742GDRPit –0.0054INFit+0.01464LDRit +0.00287CARit- . 0.057LGit + eit

The interpretation of the equation model above can be explained as follows:

a. Constant. This means that the NPL value of BPD is 0.0195 if the independent variables are ignored or equal to zero (0).
b. The GDRP (Regional Economic Growth) variable, states that economic growth has a positive effect on NPL

c. Variable INF (Inflation), states that inflation has a negative effect on NPL.
d. Variable LDR (Loan to Deposit Ratio), which states that LDR has a positive effect on NPL.
e. The variable CAR (Capital Adequacy Ratio), states that CAR has a positive effect on NPL.
f. The LG variable (Credit Growth), states that credit growth has a negative effect on NPL.

The interpretation of the cross section coefficient value for each variable is as follows:

a. The GDRP variable, when the economic growth of West Kalimantan Province increases by 1% it will reduce the NPL of West Kalimantan BPD by 0.009375% assuming other factors remain.
b. The INF variable, when inflation in West Kalimantan Province increases by 1%, it will reduce the NPL of West Kalimantan BPD by 0.022185% assuming other factors remain.
c. The LDR variable, when the LDRBPD of West Kalimantan increases by 1%, it will reduce the NPL of the BPD of West Kalimantan by 0.002146% assuming other factors remain.
d. CAR variable, when credit growth of West Kalimantan BPD increases by 1% it will reduce the NPL of West Kalimantan BPD by 0.073796% assuming other factors remain.

3.4 Hypothesis Testing Results

a. Partial Significance Test (t Test)

Table 4 t test results

Variable	Coefficient	t-Stats	Prob.	Prob.
C	0.0195	1.75765	0.0813	0.0813
GDP	0.00742	0.15751	0.8751	0.8751
INF	-0.0054	-0.1113	0.9116	0.9117
LDR	0.01464	1.42884	0.1556	0.1556
CAR	0.00287	0.08273	0.9342	0.9342
LG	-0.057	-5.7914	0.0000	0.0000

The interpretation of the results of the partial significance test (t test) based on Table 4.2 above can be explained as follows:

a) Variable GDRP (Regional Economic Growth). It can be concluded that regional economic growth partially has a positive and insignificant effect on NPL.
b) Variable INF (Inflation), it can be concluded that regional inflation partially has a negative and insignificant effect on NPL.
c) Variable LDR (Loan to Deposit Ratio). So it can be concluded that LDR partially has a positive and insignificant effect on NPL.
d) Variable CAR (Capital Adequacy Ratio). So it can be concluded that CAR partially has a positive and insignificant effect on NPL.
e) Variable LG (Credit Growth). So it can be concluded that credit growth partially has a negative and significant effect on NPL.

b. Simultaneous Significance Test (F Test)

Table 5 F Test Results

Independent Variable	Dependent Variable	F-Stats	Prob (F-statistic)	Information
GDRP, INF, LDR, CAR, LG	NPL	7.403884	0.000004	Significant

Based on Table 5, it is explained that together there is a significant effect of the variables GDRP, INF, LDR, CAR, and LG on NPL.

c. Coefficient of Determination (R2)

Table 6 Coefficient of Determination

Independent Variable	Dependent Variable	R-Squared	Adjusted R-Squared
GDRP, INF, LDR, CAR, LG	NPL	7.403884	0.000004

Based on Table 6, it can be seen that the Adjusted R-Square value is 0.198854. This means that the variables GDRP, INF, LDR, CAR, and LG can explain the NPL variable of 19.8854% and the remaining 80.1146% can be explained by other variables not listed in the research model.

3.5 Discussion

a. The Effect of Regional Economic Growth on Non-Performing Loans

Conceptually, when there is an increase in economic growth which is reflected by an increase in people's income, it will have an impact on the ability to pay (credit) of customers which also

increases so that it will reduce the bank's NPL ratio. However, the results of this study found a positive and insignificant relationship between economic growth and NPL.

b. The Effect of Regional Inflation on Non-Performing Loans

Conceptually, when inflation occurs, Bank Indonesia as the monetary authority in Indonesia has the authority to raise the benchmark interest rate in order to control the inflation rate. Banks will then respond to this by raising the deposit interest rate followed by an increase in credit interest rates. This will reduce the ability of the debtor to pay its obligations (credit) thereby increasing the NPL or credit problems. However, the results of this study found a negative and insignificant relationship between regional inflation and NPL.

c. Effect of Loan to Deposit Ratio on Non-Performing Loans

LDR is a ratio that describes a bank's ability to channel credit. A high LDR means that there is a high credit distribution. Thus the risk of non-performing loans or NPLs will also increase. So the higher the LDR of a bank, the higher the NPL of the bank.

d. Effect of Capital Adequacy Ratio on Non-Performing Loans

Conceptually, the higher the CAR, the greater the bank's ability to minimize credit risk, meaning that the bank is able to cover the credit risk that occurs with the amount of reserve funds obtained from the ratio of capital and Risk Weighted Assets (RWA).

e. The Effect of Credit Growth on Non-Performing Loans

In theory, high credit growth reflects an expansionary movement of banks in lending by increasing the number of loans disbursed. The higher the amount of credit disbursed by the bank, the potential for credit risk will increase which in turn will increase the bank's NPL ratio. However, the results of this study found a negative and significant relationship between credit growth and NPL.

4. CONCLUSION

Based on the results of the research and discussion described in the previous chapter, it Regional economic growth (PDRB) has a positive and insignificant effect on the NPL of Regional Development Banks. Regional inflation has a negative and insignificant effect on the NPL of Regional Development Banks. LDR has a positive and insignificant effect on the NPL of Regional Development Banks. CAR has a positive and insignificant effect on the NPL of Regional Development Banks. Credit growth has a negative and significant effect on the NPL of Regional Development Banks. Regional economic growth (GRDP), inflation, LDR, CAR, and credit growth simultaneously have a significant effect on the NPL of Regional Development Banks.

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