Bank-Specific and Macroeconomic Determinants of Non-Performing Loan of Regional Development Banks in Indonesia

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Abstract: *Regional Development Bank (BPD) is a financial institution which has an important role in community development and regional economy, both as an institution which collects and distributes funds to the community. Credit disbursement by BPD is inseparable with the presence of credit risk in which the debtors fail to pay their obligations both in the form of principal and interest obligation. BPD has a higher loan ratio compared to the other type of commercial banks, with an average loan ratio of 3.01% throughout 2012 to 2015. This study aims to examine factors influencing Non-Performing Loan (NPL) of BPD in the period of 2012-2015. Bank-specific variables which have an impact on NPL namely Return on Equity (ROE), Ratio of Operating Expenses to Operating Income (BOPO), bank size, and credit growth. ROE, bank size, and credit growth have a negative impact on NPL, while BOPO has a positive impact on NPL. Macroeconomic variables which have an impact on NPL are exchange rate and Gross Regional Domestic Product (PDRB) growth. Exchange rate has a positive impact on NPL while PDRB growth has a negative impact on NPL. BPD should improve its risk management by carefully taking into account the indicators of bad debt and be more selective in disbursing credit.*

Keywords: Non Performing Loan, Bank-Specific, Macroeconomic, Panel Data.

1. Introduction

Banks generally function as financial intermediaries between those who want to save money and those who need funds. Lending is the primary activity of banks in generating profits which are derived from the difference between lending interest rate and deposit interest rate. However, the greatest risk of banks also comes from the lending itself.

BPD has its own characteristics in its asset development, Third-Party Funds (DPK), and credit disbursement compared to other type of bank. Asset growth of BPD fluctuated from 2012 to 2015, in which from 2012 to 2014 it experienced a decline, but in 2015 BPD was the only bank which experiencedan increaseof asset growth with the percentage of 18.17%. In terms of DPK growth percentage, year 2013 is the year when BPD's DPK experienced a significant decreaseto single digit point at 8.21%. BPD was capable to increase its DPK growth by 9.46% and 20.98% sequentially in 2014 and 2015. Meanwhile, in terms of loan growth percentage, BPD was able to increase itby 22.63 % and 23.38 % sequentially in 2012 and 2013. Howeverit decreased by 15.89 % and 11.18 % sequentially in 2014 and 2015 due to economic growth deceleration.

BPD as a financial institution which develops and drivesregional economy through credit disbursement should be able to manage credit risk as good as possible. The credit risk management should be in conformity with the provision of Bank Indonesia namely the NPL as one of the health indicatorsshould be less than 5%.

BPD is one of financial institutions which has an important role in regional economic development with parts or all of its share ownershipis owned by the provincial government.

Credit disbursement to community conducted by BPD is inseparable from credit risk. BPD had a higher loan ratio compared to the other types of commercial bank, with an average loan ratio of 3.01% throughout 2012 to 2015. Itwas due to a quite large regional government intervention in credit disbursement and BPD's unfavorable credit management that lead to an increase of NPL.

Internal factorsare one of the factorscausing NPL (Warue 2013; Firmasyah 2014; AbiddanZouri-Gobel 2014) which are not only from human resources quality, but also from company policy and risk management process procedures of the bank. In addition to internal factors, external factors are considered important in causing the NPL (Mehmood*et al.* 2014; NikolaidoudanVogiazas 2015; Žiković *et al.* 2015) such as changes in macroeconomic conditions that have direct and indirect impact on various types of business.

Based on the problem formulation, the obtained study objectives are as follows:
1. Analyzing NPLdevelopment of BPD in Indonesia in the period of 2012-2015.
2. Analyzing the factors which significantly influenceNPL of BPD in Indonesia.

2. Data

The data used in this study are secondary data in the form of quarterly data in the period of 2012-2015. The samples employed are 25 BPD. Secondary data were obtained from the internet, financial reports, and results of relevant studies.

3. Methodology

This study utilizes qualitative and quantitative analysis. Qualitative analysis is employed to analyze NPL development of BPD in the period of 2012-2015. Quantitative analysis used is panel data analysis because the information used employ cross section and time series approach. The panel data approach used is Fix Effect Model (FEM).

The model used in this study refers to the study byAmir (2014), namely:

$$NPL_{i,t} = \beta_{1,i} + \beta_2 ROE_{i,t} + \beta_3 CAR_{i,t} + \beta_4 LDR_{i,t} + \beta_5 NIM_{i,t} + \beta_6 BOPO_{i,t} + \beta_7 Sze_{i,t} + \beta_8 Prf_{i,t} + \beta_9 Prt_{i,t} + \beta_{10} IR_{i,t} + \beta_{11} Inf_t + \beta_{12} ER_t + \beta_{13} PDRB_t + \varepsilon_{i,t}$$

The hypotheses used in this study are as follows:

H_1 : Return on Equity (ROE) has negative impact on NPL of BPD

H_2 : Capital Adequacy Ratio (CAR) has negative impacton NPL of BPD

H_3 : Loanto Deposit Ratio (LDR) has positive impacton NPL of BPD

H_4 : Net Interest Margin (NIM) has negative impacton NPL of BPD

H_5 : Ratio of Operating Expenses to Operating Income(BOPO) has positive impacton NPL ofBPD

H_6 : Bank size has negative impacton NPL ofBPD

H_7 : Credit growth has negative impact on NPL ofBPD

H_8 : Risk profile has negative impact on NPL ofBPD

H_9 : Interest rate has positive impact on NPL ofBPD

H_{10} : Inflation has positive impacton NPL of BPD

H_{11} : Exchange rate has positive impacton NPL ofBPD

H_{12} : Gross Regional Domestic Product (PDRB) growth has negative impacton NPL ofBPD

4. Results

One of the biggest problems encountered by a bank is related to bad debt problem or NPL. The bank's main income comes from the interest generated from lending activity. In other words, if the credit disbursed becomes problematic or bad debt happens, it will have an impact on the profitability and health of the bank itself. Therefore, it is important for a bank to minimize the emergence of credit risk as good as possible.

The development of average NPL of 25 BPD in Indonesia from 2012 to 2015 remained within the threshold stipulated by Bank Indonesia namely 5%, with the trend of average NPL experienced an increase. However, there are still some BPDthat own aworrisome NPL with a ratio of more than 5%. They are, among others, BPD of East Kalimantan, BPD of North Sumatera, BPD of South Sumatera and Bangka Belitung, BPD of Papua, BPD of DKI Jakarta, and BPD of South Kalimantan. The high NPL of BPD of East Kalimantan was dominantly caused by credit in construction sector and business services sector. On the contrary,the high NPL of BPD of North Sumatra in 2014-2015 was due to many problematic working capital loans. The largest contributor to it was trade, restaurants, and hotels sector, and others. The high NPL of BPD of South Sumatera and

Bangka Belitung throughout 2012-2015 was dominated by NPL in working capital loans.Construction sector was the main contributor to it. The high NPL of BPD of Papua throughout 2014-2015 was due to the high amount of NPL in working capital loans, especially forconstruction sector. The high NPL of BPD of DKI Jakarta in 2015 was dominated by NPL in construction sector. Lastly, the high NPL of BPD of South Kalimantanin 2015 was due to the high bad debt in business services sector.

There are three types of econometric model in panel data analysis method, namely Pooled Least Square (PLS), Fixed Effects Model (FEM), and Random Effects Model (REM). The first test conducted in model selection is Chow Test. Based on the result of Chow Test, the suitable model isFEM. Similarly, the second test conducted namely Hausman Test, reveals that FEM is the most suitable model to use.

Classic assumption test includes normality test, multicollinearity test, heteroscedasticity test, and autocorrelation test (Winarno 2015).

1. Normality
This study uses11 variables with the number of observations of 400, so it can be said that the data in this study follow normal distribution. In addition, the Jarque-Bera probability value (p-value) exceeds the significance level of 5% so that the residual of this research's data is considered to be normally distributed.

2. Multicollinearity
Multicollinearity test is undertaken to check the presence oflinear correlation among the independent variables. There is no correlation value among the independent variables of this research which exceeds 0.8 so there is no assumption of multicollinearity.

3. Heteroscedasticity
Heteroscedasticity can be figured out by comparing the Sum Squared Resid Weighted Statistic with Sum Squared ResidUnweighted Statistic. Heteroscedasticity happenswhenSum Squared Resid Weighted Statisticsis less than the Sum Squared ResidUnweighted Statistics. The model in this research uses GLS Cross-Section so tha theteroscedasticity problem can be immediately corrected.

4. Autocorrelation
Autocorrelation is easily found in times series data. Autocorrelation test can be performed by looking at the model's value of Durbin-Watson statistic and comparing it to the values on Durbin Watson Table. The model in this research uses the weighting method of GLS Cross-Section Weight so that the autocorrelation problem can be immediately corrected.

There are several statistical tests namelycoefficient of determination (R^2), F-Test, and T-Test. The model of this research owns the R^2 value of 0.873692. It means that 87.36% of dependent variable variance is able to be explained by the independent variables variance. The R^2 value which exceeds 80% is considered to be able to properly explain theindependent variables variance, while the rest are explained by the other factors outside the model.

F-test is employed to figure out all impacts of independent variables on the dependent variable. Based on the F-test result on model, the p-value of this research's model is 0.0000 which is less than the significance level of 5%. It means that the independent variables used in the model of this researchsimultaneously have an impact on NPL of BPD.

The dependent variable used in this research is the NPL of BPD. The independent variables used in this researchare divided into two types of variable, namely variables that come from internal factors and variables that come from external factors. The internal factors mentionedconsists of ROE, CAR, LDR, NIM, BOPO,bank size, risk profile, credit growth, and lending interest rate. Meanwhile,the external factors referred are regional inflation, exchange rate USD/IDR, and PDRB growth.

Table 1: Estimation Result of the model of BPD's NPL

Variables	NPL	
	Coefficient	Probability
ROE	-0.013914**	0.0494
CAR	-0.008538	0.4409
NIM	0.024303	0.2978
LDR	0.001197	0.7410
BOPO	0.018520**	0.0023
Bank size	-25.55478**	0.0060
Credit growth	-0.033407**	0.0000
Risk profile	-0.984449	0.1425
Lending interest rate	0.014959	0.3392
Inflation	-0.019440	0.2144
Exchange rate	0.889719**	0.0005
PDRB growth	-0.054825**	0.0007
C	-4.402337	0.0790

Information: ** significant at thesignificance level of 5%

The first hypothesis used is that the increase in ROE would lower the NPL ratio of BPD. This research result reveals that ROE has negative and significant impact onNPL ratio of BPDwhich meansthat higher ROE will lead to a declining NPL. This ratio can also reflect the quality management and effectiveness of the business product. A good effectiveness of the business product can minimize the credit risk. This result is consistent with the research result ofTsagkanos and Bellas (2014), Gezu (2015), Lauzi*et al.* (2010).

The fifthhypotheses used is that the increase in BOPO ratio will increase NPL ratio of BPD. This research result shows that BOPO has positive and significant impact on NPL ratio of BPD. BOPO reflects the quality of bank management in terms of efficiency. The lower the bank's operational costs, the more efficient the bank is considered so that it can improve its health and profitability. The bank's high health level can minimize the credit risk. This resultis supported by the research ofPoppeira and Weill (2007).

The sixthhypotheses used is that the larger the bank size, the lower the NPL ratio of BPD. This research resultindicates that bank size has a negative and significant impact on NPL ratio of BPD. The larger the bank's asset size, the greater the loans disbursed so that it will reduce the lending interest rate. A decrease in lending interest rate would expedite loan payments so that the credit risk can be diminished. This research result is inline with the research of Polodoo*et al.* (2015).

The seventh hypotheses used is that an increase in credit growth will decrease the NPL ratio of BPD. This research resultpoints that the credit growth has a negative and significant impact on NPL of BPD. The greater the loans disbursed by the bank, the more evaluation and quality improvement it performs on the loans, so that the credit risk can be minimized. This result is consistent with the research conducted byVandar and Özgüler (2015) and Ekanayake and Azeez (2015).

The eleventh hypothesis used is that exchange rate will positively influence the NPL ratio of BPD. The result obtained in this researchshows that exchange rate has a positive and significant impact on NPL of BPD. Currency depreciation will cause the price of imported goods to become relatively more expensive. Consequently, the companies that utilize imported raw materials experience an increase in production cost that will lead to an increase in selling price of the products. The increase in prices will raise inflation so that the community's purchasing power will decline. The decline in community's purchasing power will reduce the demand for the products and eventually the company's revenue.A dropping revenue means an increase in the possibility of NPL. This result is in line with the research conducted by Halim (2015) and Khemraj and Pash (2009).

The last hypothesis used is that the higher the PDRB growth, the lower the NPL ratio of BPD. The result obtained in this research reveals that PDRB growth has a negative and significant impact on NPL of BPD. PDRB is an indicator of the economic advancement. The higher the PDRB, the higher the ability of community to pay their obligations. This result isconformable with the research carried out by Amir (2014), Vatansever and Hepşen (2015), Tsagkanos and Bellas (2014), Warue (2013), Firmansyah (2014), and Žiković*et al.* (2015).

5. Managerial Implication

Banking Management
BPD is a financial institution which has an important role in community development and regional economy, both as an institution which collects and distributes funds to the community. Implication for banking practitioners is to improve risk management by carefully taking into account the indicators of bad debts and how to solve it. Based on the results obtained in this research,the internal variables that significantly affect the NPL of BPD are ROE, BOPO, bank size, and credit growth. BPD should be able to increase its operating income. Bank's operating income is mostly in the form of interest income, such as interest rate, which is obtained from credit disbursement service for community. BPD's management is expected to be more rigorous and selective in providing credit to minimize an excessive bad debts.

The external variables that significantly influence the NPL of BPD are exchange rate and PDRB growth. BPD is expected to be more stringent in monitoring the quality of credit portfoliosthat are vulnerable to macroeconomic factors and can affect the debtors in paying their credit.

Financial Services Authority (OJK)

OJK functions as the organizer of regulatory and supervisory system that is integrated to the overall activities in the financial services sector, including banking sector. OJK is expected to tighten its supervision on BPD because it is classified as a bank which has an annually continuous increasing NPL and has a higher NPL compared to the other banks. Furthermore, OJK is expected to provide assistance and consultation for BPD that have a high NPL ratio.

Bank Indonesia

Bank Indonesia as the central bank has an important role in controlling monetary policy, either in the form of controlling inflation, interest rates, and currency stability. One of the macroeconomic factors that influences credit risk is exchange rate. Therefore, Bank Indonesia should be able to maintain domestic currency stability as it can foster public confidence and business sector confidence in performing economic activities, both consumption and investment so that the national economy can grow well.

6. Conclusions

Based on the result discussions, it can be concluded that:
1. The development of average NPL of BPD throughout 2012 to 2015 experiences an annual increase but it is still at a safe level of less than 5% as stipulated by Bank Indonesia. BPD who has an NPL ratio of more than 5% are BPD of East Kalimantan, BPD of North Sumatera, BPD of South Sumatera and Bangka Belitung, BPD Papua, BPD of DKI Jakarta, and BPD of South Kalimantan.
2. Bank-specific variables that affect the NPL of BPD are ROE, BOPO, bank size, and credit growth. ROE, bank size, and credit growth have negative impacton NPL, while BOPO has a positive impact on NPL. Macroeconomic variables that have an influence on NPL are exchange rate and PDRB growth. Exchange rate has a positive impact on NPL while PDRB growth has a negative impact on NPL.

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