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THE EFFECT OF CREDIT GROWTH ON CREDIT RISK AT REGIONAL DEVELOPMENT BANKS IN INDONESIA

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ABSTRACT

Credit risk is an important indicator in determining the health of a bank. This study aims to investigate the impact of credit growth on credit risk in Regional Development Banks in Indonesia. This research uses panel data regression methods on 21 Regional Development Banks in Indonesia for the period from 2011 to 2021, with data sourced from the annual financial reports of each bank. The results of the data analysis show that credit growth significantly affects credit risk. This study can provide information on the impact of the phenomenon of credit growth on credit risk in Regional Development Banks in Indonesia, which becomes the basis of information and policy consideration in optimizing credit levels and the depiction of credit risk in Regional Development Banks.

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1. INTRODUCTION

The banking sector plays a very important role in a country's economy. As a fundraising institution and national and international trade facilitator, the banking sector contributes significantly to economic development (Kasmir, 2008). In Indonesia, banks are grouped into four based on ownership: Government (General) Banks, National Private Banks, Foreign Banks, and Mixed Banks. One of the bank groups that has an important role in regional economic development in Indonesia is the Regional Development Bank (BPD) which is part of the Government Bank.

Indonesia has BPD in almost every province. The number of BPDs grew from two banks in 1959 and today to 27 BPDs. In Law Number 13 of 1962 concerning the Basic Provisions of BPD, it is stated that BPD was established to provide financing for the implementation of regional development efforts in the framework of Universal Planning National Development. Previous research has found that there are consistent positive effects of regional banks on regional economic development (Crouzille, 2012).

However, Indonesia's economy is facing significant challenges, especially due to the Covid-19 pandemic. The decline in global economic activity, including in Indonesia, has occurred as a result of the pandemic. In 2020, Indonesia's economic growth contracted by 2.07%, the lowest figure in the last 20 years (Central Statistics Agency, 2020).

Joseph Schumpeter (1911) argued that services provided by financial institutions could promote economic growth through increased capital accumulation and economic efficiency. This view is reinforced by research by Goldsmith (1959) and McKinnon (1973) which shows a close relationship between financial and economic development in several countries.

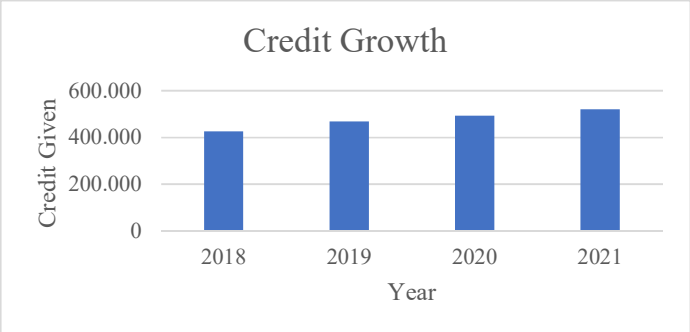

Figure 1. Bank Credit Growth Chart in Indonesia 2018-2021
Source : Indonesian Banking Statistics

In Figure 1, it can be seen that credit growth disbursed by Regional Development Banks (BPD) in Indonesia continued to increase in 2020 compared to the previous year. This shows that BPD carries out its role as a financial intermediary institution, especially in channeling credit needed by the community to encourage national economic growth. However, it is important to pay attention to the relationship between credit growth and credit risk that occurs in Regional Development Banks (BPD) in Indonesia. Credit growth can be said to represent a risk for banks (Cucinelli, 2016),

Previous research has shown that credit growth can be influenced by several factors. One of them is financial *deepening,* where financial institutions develop their activities to increase credit growth. In addition, credit growth can also be triggered by *normal cyclical upswings*, where demand and availability of credit increase along with the economic recovery process. However, credit cycle fluctuations that tend to become excessive caused by insufficient capital in the financial sector to face difficult market conditions can also affect credit growth (Engle, 2018)

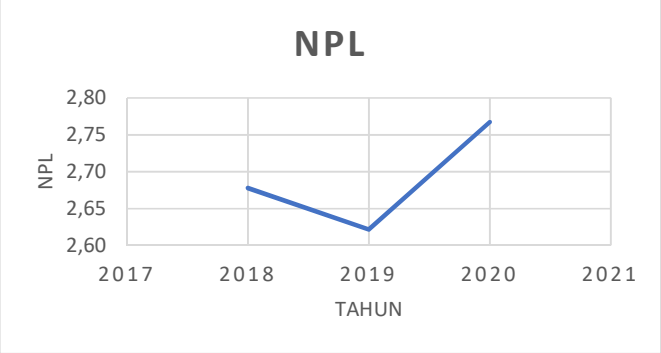

Figure 2. NPL Chart of Regional Development Banks in Indonesia
Source : Indonesian Banking Statistics, 2020

The level of *Non-Performing Loan* (NPL) at Regional Development Banks is an important indicator in assessing bank health. Statistical data shows that the NPL level in BPD reached 2.77% in 2020, up 15 basis points (bps) compared to the previous year (Indonesian Banking Statistics, 2020). In a fairly comprehensive study on credit growth, it is stated that in most OECD (*Organization for Economic Co-operation and Development)* countries, high credit growth causes higher risks for banks (Van Dang Dang, 2019). However, if effective credit growth and risk management can be carried out, the risk of bad loans can be controlled despite the high credit growth rate. This statement is supported by research on credit growth and credit risk in developing countries such as Vietnam (Shih-Wei Wu, 2022)

In the context of this study, further more specific research on Regional Development Banks (BPD) in Indonesia is needed to gain a deeper understanding of the relationship between credit growth and credit risk. There are differing opinions in previous studies on this relationship, so in-depth and focused research on BPD in Indonesia will provide more accurate insights.

2. LITERATURE REVIEW

Credit Risk

Credit risk is failure to meet obligations at maturity, bankruptcy or delay in payment, denial of obligations, and acceleration of payment of obligations or default (Laurent, 2008). *Non-Performing Loan* Ratio or non-performing loans in a bank If non-performing loans increase, the risk of decreasing profitability is even greater. If profitability decreases, the bank's ability to expand credit decreases and the credit rate decreases (Widodo, 2016).

Factors affecting NPL

There are several factors that can affect NPLs, namely Operating Costs to Operating Income (BOPO), *Bank Size*. (Shih-Wei Wu, 2022) and *Capital Adequacy Ratio* (CAR) (Foos *et al.,* 2010). BOPO is a ratio that measures the extent to which a bank's operating expenses compare to its operating income.

A high BOPO ratio can be an indication of a bank's operational inefficiency and can affect NPL levels (Shih-Wei Wu, 2022). Several studies show that *Bank Size* affects NPL levels so that banks that have large asset values tend to have lower NPL risk because they have greater economies of scale and better resources to manage credit risk (Shih-Wei Wu, 2022). In addition, there is a capital ratio in the form of *Capital*

Adequacy Ratio (CAR) which can indicate the level of capital adequacy of banks in facing credit risk. The CAR ratio has a significant positive relationship to NPL levels so the higher the CAR ratio, the higher the NPL level (Fools *et al.,* 2010)

Credit Growth

Credit growth describes the level of development of total credit that has been disbursed to third parties in a certain period (Caballero, 2016). Credit also has an important role to support economic growth (Meng, 2016). Several studies in developing countries have shown that excessive credit growth can lead to many non-performing loans in banks. Credit growth can make bank lending standards looser in order to compete with other banks. However, all three standards become loose, they can quickly lead to the risk of non-performing loans if the debtor's ability to pay is reduced due to a lighter loan appraisal and approval process (Shih-Wei Wu, 2022).

Hypothesis

Research by Merilainen (2016) found a significant relationship between credit growth and credit risk during the financial crisis in Western European countries. A similar study was also conducted by Shin Wei Wu (2022) which found that credit growth had a significant effect on NPLs at domestic banks in Vietnam. Based on these findings, it can be assumed that Vietnam, as a developing country, has characteristics comparable to Indonesia

Shin Wei Wu (2022) also mentioned that credit growth affects NPLs. Thus can be written hypotheses as follows

H1 = Credit growth has a significant negative effect on credit risk at Regional Development Banks in Indonesia

3. METHODS

Research Variables

Research variables can be seen from two angles, namely from the point of role and nature. In this study, the variables used are the dependent variable in the form of credit risk and the independent variable in the form of credit growth. The proxy for each variable is the credit risk variable approached by the NPL size. NPL data is obtained from the annual financial statements on BPD which is a percentage of total non-performing loans provided by banks.

The independent variable is credit growth with a proxy for credit growth (PK). Credit growth data can be obtained from BPD's annual financial statements which include the percentage change in credit from the previous period. In addition, there are control variables used are macroeconomic factors in the form of inflation (In) to represent the demand side of credit, in addition to specific bank factors, namely *Capital Adequacy Ratio,* Bank Size*, and Operating Costs to Operating Income.*

Research Data

The data used in this study is secondary data obtained from the publication of the annual financial report of each BPD in Indonesia. Data in the form of annual data NPL, CAR, SIZE, BOPO at 21 Regional Development Banks in Indonesia and inflation in Indonesia. Data period used from 2011 to 2021

Analysis Methods

This study used a panel data regression analysis method with a model adapted from Shin Wei Wu's research (2022).

$$NPL_{it} = \alpha + \beta_1 KREDIT_{it} + \gamma_1 CAR_{it} + \gamma_2 LnSIZE_{it} + \gamma_3 BOPO_{it} + e_{it} \quad (1)$$

where:
NPL = Non-Performing Loan of Regional Development Bank for the period 2011-2021
CREDIT = Regional Development Bank Credit Growth for the period 2011-2021
CAR = Capital Adequacy Ratio of Regional Development Banks for the period 2011-2021
BOPO = Operating Income Expense of Regional Development Bank for the period 2011-2021
LnSIZE = Natural Logarithm of Bank *Size* of Regional Development Bank for the period 2011-2021
e = Matrix of error values
α =*constant*
β = Multivariate Regression Model Parameter Matrix
i = Bank ke-i, *i=1,2,.....,21*

t = t-year, t = *2011,....., 2021*

4. RESULTS AND DISCUSSION

Data Description

Descriptive statistics in this study are useful for seeing an overview of independent variables and dependent variables. Information contained in descriptive statistics includes the highest value (*maximum*), lowest value (*minimum), average (*mean*), and standard* deviation (*standard deviation).*

In this study, the number of banks that became the object of research was 21 BPD by excluding 6 banks due to the unavailability of data on the bank's website. The study used annual data for 11 years from 2011 to 2021 as many as 2300 observational data.

Table 1. Statistical Descriptive Table

Variable	Minimum	Maximum	Mean	Std. Deviation
NPL	0.150000	22.27000	2.523593	2.253551
CREDIT	-37.14585	59.07334	13.21387	13.141
CAR	8.020000	41.68000	20.65852	5.156770
Ln_SIZE	14.58979	18.88036	16.55419	0.877804
BOPO	56.6000	195.7000	78.30335	15.17096

Processed Non-Performing Loan (NPL) has an average value of 2.52%. The highest value of 15.63% occurred in BPD Papua in 2016. Based on BPD Papua's annual report in 2016, there is an increase in credit risk due to slow disbursement of new loans due to competition between banks and *Financial Technology* (Fintech). In addition, in BPD Papua there are internal obstacles, namely the lack of a definitive Director who specifically supervises direct credit. The lowest value of 0.15% occurred in BPD West Kalimantan in 2011. Based on BPD West Kalimantan's 2011 Annual Report, NPL ratio in the fourth quarter of 2011 improved in line with better economic and regional banking conditions in 2011 and the implementation of policies and strategies to improve credit quality.

In the independent variable, namely credit growth, an average value of 13.23% was obtained. The minimum value at -37.15% occurred in BPD Banten in 2015. Based on the 2015 BPD Banten Annual Report, the decline in economic performance due to declining export value impacts BPD Banten, so selective credit distribution resulted in lower credit growth compared to 2014 due to an increase in NPLs and declining deposit growth compared to the previous year.

Meanwhile, the maximum credit growth of 59.07% occurred in BPD Banten in 2012. According to BPD in 2012 economic growth amounted to 6.23% and the majority of the growth came from domestic consumption so that there was an increase in the level of consumer confidence and maintained people's purchasing power so that market demand increased. This is in line with the 2012 BPD Banten Annual Report where there is an increase in credit growth and is also supported by the expansion of the office network to 207 offices from previously only 187 offices in 2011. In addition, BPD Banten also enlarged the ceiling on the products offered and launched new products.

In another control variable, CAR, the average value for CAR was 20.62%. The maximum value for this variable is 41.68% which occurred in BPD Banten in 2021. Based on the 2021 BPD Banten Annual Report, there was a significant increase in the capital aspect with equity of IDR 1.9 trillion, an increase of 38.9% from 2020 of IDR 529.5 billion. This causes the CAR ratio in 2021 to be 41.68%. The minimum value at 8.02% occurred in BPD Banten in 2015. Based on the annual report of BPD Banten in 2015, the CAR ratio decreased compared to 2014, it is also the impact of the decline in the global and national economy due to a decline in export performance which has an impact on the decline in capital in BPD Banten.

In the BOPO variable, an average value of 78.47% and a standard deviation of 15.17096 were obtained. The minimum value of 56.60% contained in BPD Sultra in 2011 based on the Annual Report of BPD Sultra in 2011 resulted in an increase in interest income in 2011 amounting to Rp. 294 billion compared to 2010 of Rp. 227 billion. There were operating expenses other than interest in 2011 amounting to Rp. 119 billion compared to 2010 amounting to 157 billion. While the maximum value of BOPO is 195.70% which occurred in BPD Banten in 2016. Based on the 2016 BPD Banten Annual Report, the BOPO ratio was recorded at 5.77% higher than the set target, this was due to the high percentage of BOPO realization compared to the percentage of operating income and also external factors such as competition in lending and fund interest rates and macroeconomic conditions.

In the SIZE variable, an average value of 16.55 was obtained with a standard deviation of 0.8805997. The minimum value of 14.58 occurred in BPD Bengkulu in 2011. According to the Annual Report of BPD

Bengkulu in 2011 there was an increase in assets of Rp. 2,169 million compared to 2010 of Rp. 1,759 million. The total assets are smaller than other BPDs which are in the billions to trillions.

Meanwhile, the maximum SIZE value of 18.88 occurred in BPD West Java and Banten in 2021. Based on the Annual Report of BPD West Java and Banten, in 2021, total assets were increased by 12.35% to reach Rp. 158.36 trillion, supported by digital acceleration and an increase in transactional banking business so that performance continues to grow in the conditions of the Covid-19 pandemic

Panel Data Model Selection

Several tests were carried out in selecting the panel data model, namely the Chow test and the Hausmann test. With a summary of the test results as follows

Table 2. Panel Data Model Selection Table

Regression Model	Test Chow	Uji Hausmann
Credit Growth against Credit Risk	0.0000**	0.0008**

**Prob <0.05

The Chow test is used to determine whether the model will follow *a pooled regression* or *Fixed effect Model.* Based on the Chow Test results table, it can be known that the probability value *of a good chi-square cross-section* in the regression model is 0.000. Values of 0.000 < 0.05, so *the Fixed Effect Model* is more appropriate to use. After knowing that *the Fixed Effect Model is* more appropriate to use, it is certain to use the Hausmann Test again to see if a *Random Effect Model* is needed. A *p-value of* < 0.00 is obtained to ensure that the regression model uses the *Fixed Effect Model*.

Classical Assumption Test

Classical assumption testing is needed to ensure Fixed *Effect Model modeling* can continue:

Table 3. Normality Test Table

Regression Model: *Credit Growth* against Credit Risk	
Shapiro–Wilk Test (Normality Test)	0.7486
Breusch- Pagan Test (Heteroscedacity Test)	0.6554
Multicollinearity Test	VIF < 10
Durbin-Watson Test (Autocorrelation Test)	0.5508
*Prob <0.10	
**Prob <0.05	

Based on the Table above, it can be seen that the probability values of each of the classical assumption tests are all satisfied. This indicates that the model used can be considered valid.

Regression Analysis of the Effect of Credit Growth on Credit Risk

Regression Analysis Results

Based on the test results above, the best model for the first hypothetical regression analysis is *the Fixed Effect Model* with the results of regression analysis as follows

Table 4. Model 1 Hypothesis Testing Table

Hypothesis: *Credit growth affects credit risk at Regional Development Banks in Indonesia*

Variable	Factor	T stat	Prob
CREDIT	-0.027572	-2.6588	0.009631**
CAR	0.056570	2.1109	0.038203**
SIZE	-1.180012	-2.5341	0.013421**
BOPO	0.099379	5.4336	0.000000**
R2	0.61917		
F state	29.6722		
F Prob	0,00000**		

**p-value at 5 percent level are significant

Based on the results of regression with the selected model, namely the Fixed Effect Model panel data, this case produced a simultaneous test value/F statistics of 29.6722 with a probability value of 1.1733e-

14< alpha (0.05) this shows that simultaneously there is an influence of the independent variable on the NPL variable. *The Fixed Effect Model* also yields an R-squared value of 0.619, which shows that 61.9% of the diversity of NPL models can be explained by the independent variables CAR, Credit, Ln_size and BOPO.

In the partial test, the variables CAR, Credit, Ln_size, and BOPO significantly influenced NPL. These results show that credit growth has a negative effect on credit risk which means that if credit growth increases then credit risk decreases.

This finding is consistent with previous research by Shin Wei Wu (2022) which stated that credit growth has a significant effect and has an inversely proportional effect on credit risk. This indicates that when banks increase loan ratios but reduce bad loans, it can increase economic activity and positively impact borrowers' ability to repay their obligations.

However, it should be noted that some studies also state that there is a significant positive relationship between credit growth and credit risk (Saurina, 2002). This research explains that credit expansion can increase credit risk. especially if there is pressure from competitors, inefficient government policies or improper business orientation (Saurina, 2002)

In the context of BPD, the relationship between credit growth and credit risk is inversely proportional. This is supported by Indonesian banking statistics (2020) which shows that the consumer sector dominates BPD's loan portfolio by 70%. The profile of borrowers in BPD is generally the State Civil Apparatus with a fixed and stable income so that credit risk in BPD tends to be lower than commercial banks that have borrowers from various backgrounds.

In the CAR control variable, the analysis results showed a significant positive influence on NPL, which means that if the CAR ratio is high, the NPL ratio is also high. That is, banks with higher CARs tend to take on greater credit risk on the assumption that a strong capital position can absorb potential losses. In other words, banks may be more willing to extend credit to riskier borrowers. These results are in line with research by Fools, *et al (*2010)

The BOPO control variable also has a significant positive influence on NPL If the BOPO ratio is high then the NPL is high. This indicates that high operating costs reduce the bank's poriftability and capital position, thereby reducing credit loss reserves which will increase credit risk. These results are in line with research by Shih Wei Wu (2022)

Furthermore, the Bank Size (SIZE) control variable significantly negatively influenced NPLs. This indicates that larger banks tend to have lower NPL levels. This is due to better diversification of loan portfolios at larger banks, which can reduce concentration risk and limit the impact of loan defaults on overall credit risk. In addition, larger banks also have a stronger capital position, so they are able to absorb potential loan losses and reduce the risk of non-performing loans. These results are in line with research by Shih Wei Wu (2022)

5. CONCLUSION

Based on the regression results in this study, it can be concluded that credit growth significantly negatively influences credit risk (NPL) in Regional Development Banks in Indonesia. That is, the higher the credit growth, the lower the credit risk faced by banks. Referring to previous research where credit growth negatively affected NPLs in domestic banks in Vietnam where, the consideration that domestic banks apply the principle of prudence in lending so that credit growth can reduce NPL levels.

The results showed that credit risk management and bank financial management are very important in reducing NPL value in Regional Development Banks in Indonesia. Indicators such as sufficient CAR ratio, optimal bank size, and good operational efficiency are essential in minimizing credit risk and improving bank financial performance.

However, it should be noted that this study has limitations, such as limited data, the potential use of more representative variables and the research methods used. Therefore, these results must be interpreted carefully and retested using more complete methods and detailed data.

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