



The Impact of Credit Growth on Non-Performing Loans in Indonesian Commercial Banks

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Abstract

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This study analyzes the impact of credit growth on Non-Performing Loan (NPL) levels in Indonesian commercial banks during the 2020–2021 period, a time marked by economic recovery following the COVID-19 pandemic. Employing a quantitative research design with a simple linear regression model, secondary data were obtained from the Indonesian Financial Services Authority (*Otoritas Jasa Keuangan*). The analysis reveals that credit growth exerts a positive and significant effect on NPL ratios. The correlation coefficient ($R = 0.814$) and determination coefficient ($R^2 = 0.663$) indicate that 66.3% of NPL variation can be explained by changes in credit growth, while the remaining portion is influenced by other macroeconomic and internal banking factors. These findings highlight that aggressive credit expansion without effective risk management mechanisms can increase the incidence of defaulted loans, ultimately threatening financial stability. The study emphasizes that maintaining sustainable banking performance requires balancing credit expansion with prudential banking principles, rigorous monitoring of asset quality, and enhanced macroprudential supervision to mitigate systemic risks and preserve the resilience of the Indonesian banking sector.



1. Introduction

The banking sector has a strategic role in maintaining the stability and economic growth of a country through the intermediation function, which is distributing funds from surplus parties to those in need of financing. In the Indonesian context, this role is reflected in the increase in the volume of commercial bank loans, which is one of the main indicators of economic activity. Based on data from the Indonesian Banking Statistics (OJK, 2021), total commercial bank loans increased from IDR 5,480 trillion in October 2020 to IDR 5,657 trillion in October 2021. This increase indicates a recovery in economic activity after the COVID-19 pandemic. However, the increase in credit is not always followed by an improvement in loan quality, which is reflected in the relatively volatile Non-Performing Loan (NPL) ratio in the range of 3.06-3.35 percent.

According to Jessica and Chalid (2021), increasing NPLs can be an endogenous obstacle to credit growth, as high credit risks encourage banks to tighten loan disbursement policies. In other words, there is a two-way relationship between credit expansion and the level of non-performing credit. This finding is strengthened by Suprayitno and Hardiani (2021) who stated that the quality of banking assets is highly dependent on the ability of financial institutions to balance financing growth and credit risk mitigation.

During the COVID-19 pandemic, pressure on the banking sector increased significantly. Hardiyanti and Aziz (2021) show that the pandemic contributed to the surge in NPLs, especially in conventional banks that have large exposure to the micro and medium business sectors. This impact demonstrates the importance of

overseeing excessive credit expansion strategies without considering the debtor's ability to repay loans. Research by Kartikasary et al. (2020) also found that macroeconomic factors such as economic growth and interest rates significantly affect NPL rates, suggesting that credit risk control depends not only on the bank's internal factors but also on macroeconomic conditions.

In addition to external factors, the internal aspect of banking also plays an important role. Shonhadji (2020) explained that financial ratios such as Loan to Deposit Ratio (LDR) and operational efficiency have a significant influence on NPLs. When credit growth is too fast without considering risk management capacity, banks run the risk of facing an increase in non-performing loans. These findings are in line with Rachman et al. (2018) who showed that aggressive credit growth can reduce bank profitability and increase the risk of customer default.

Thus, the relationship between credit growth and NPLs is an important issue in the stability of the national financial system. This study aims to empirically analyze the influence of credit growth on NPL levels in commercial banks in Indonesia during the 2020–2021 period. The results of this study are expected to contribute to regulators and banking industry players in formulating policies that balance credit expansion and risk management, especially in the context of post-pandemic economic recovery. In addition, the results of this analysis can also enrich the literature on credit risk management in developing countries, which have different financial system characteristics than developed countries (Priyadi et al., 2021).

2. Literature Review

2.1 Credit Growth

Credit growth is the main indicator of banking intermediation activities which describes the increase in the distribution of funds from banks to the public. According to Priyadi et al. (2021), credit growth is influenced by internal factors such as loan interest rates, deposit rates, and bank risk management policies. In the macroeconomic context, credit growth plays an important role in supporting increased investment and aggregate consumption, which further drives national economic growth.

However, excessive credit expansion without considering the quality of the loan portfolio can pose the risk of increased non-performing loans. Rachman et al. (2018) found that credit growth that is not balanced with disbursement selectivity can reduce bank profitability and increase the likelihood of default. In addition, Andrayani (2018) explained that the Loan to Deposit Ratio (LDR) ratio and bank operational efficiency have a significant relationship with the credit growth rate and potential credit risk. Thus, credit growth needs to be managed carefully so as not to create risk overexposure. Supervision of the pace of credit expansion is important so that the goal of increasing economic financing does not cause long-term financial instability.

Hypothesis 1 (H₁): Higher credit growth tends to increase the risk of non-performing loans (NPLs) in commercial banks in Indonesia.

2.2 Non-Performing Loans (NPLs) and Factors Affecting Them

Non-Performing Loan (NPL) is a ratio that measures the proportion of non-performing loans to the total loans disbursed by banks. This ratio reflects the effectiveness of risk management and the quality of the bank's assets. Palupi and Azmi (2019) emphasized that increasing NPLs can be an endogenous inhibitor to credit growth because banks tend to tighten loan disbursement standards.

In addition to internal factors such as credit governance and funding structure, NPLs are also affected by external economic conditions. Kartikasary et al. (2020) show that economic growth and interest rates play a significant role in NPL fluctuations. Meanwhile, Suprayitno and Hardiani (2021) highlighted that NPLs in Indonesian commercial banks increased during the pandemic due to external pressures on debtors' ability to pay. Thus, NPLs are a reflection of the quality of credit growth and the effectiveness of risk management. The relationship between credit growth and NPLs is dynamic, where uncontrolled credit increases can degrade asset quality and increase the risk of default.

Hypothesis 2 (H₂): Credit growth has a positive and significant effect on the level of Non-Performing Loans (NPLs) of commercial banks in Indonesia

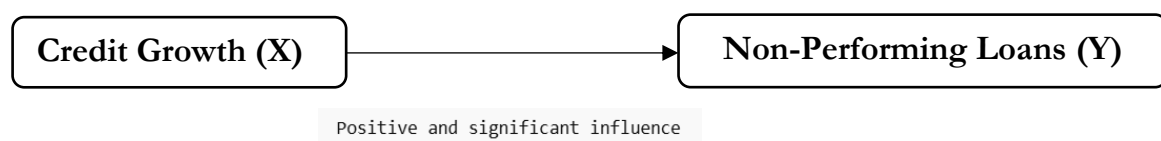


Figure.1 Conceptual Framework

Explanation: Independent Variable (X): Credit Growth (in billion IDR).
Dependent Variable (Y): Non-Performing Loan (NPL) Ratio (%). Expected Relationship: A positive and significant influence as credit growth increases, the NPL ratio is expected to rise, assuming other factors remain constant.

3. Methods

The research method used in this study is a quantitative approach with the aim of empirically examining the influence of credit growth on Non-Performing Loans (NPLs) in commercial banks in Indonesia. The quantitative approach was chosen because it was able to provide objective evidence through numerical analysis of financial data obtained from official sources, namely Indonesian Banking Statistics published by the Financial Services Authority (OJK) for the period October 2020 to October 2021.

This study uses secondary data in the form of time series, in the form of monthly aggregate data that includes total loans disbursed (in trillions of rupiah) and NPL ratio (in percent). The data was chosen because it was able to reflect the real conditions of banking intermediation activities and credit quality that occurred during the post-COVID-19 pandemic economic recovery period.

The analysis was conducted using SPSS software version 26 to test the relationships and influences between variables. The analysis stage begins with a classical assumption test, which includes a normality test, a heteroscedasticity test, and an autocorrelation test, to ensure that the simple linear regression model used meets the necessary statistical assumptions. After the data is declared to meet these

criteria, a simple linear regression analysis is carried out with the following general formula:

$$Y = \alpha + \beta X + \epsilon$$

where Y represents the Non-Performing Loan (NPL) ratio, X is credit growth, α is constant, β is the regression coefficient that indicates the direction and magnitude of the influence, and ϵ is the error term.

The next step is to conduct a significance test through a t-test to find out if credit growth has a significant influence on NPLs. If the significance value (Sig.) is less than 0.05, then an alternative hypothesis is accepted, which means that there is a significant influence between credit growth and NPL ratio. In addition, a determination coefficient (R^2) was calculated to find out how much variation in NPL changes can be explained by changes in credit growth.

The interpretation of the regression results will show the direction of the relationship between the two variables. If the value of the β coefficient is positive, then this confirms that the higher the credit growth, the greater the potential for an increase in NPLs. On the other hand, if the β is negative, then an increase in credit growth is followed by a decrease in the NPL ratio, which can indicate the effectiveness of banking risk management.

With this method, the results of the analysis are expected to prove the research hypothesis that credit growth has a positive and significant effect on the NPL level of commercial banks in Indonesia. The quantitative approach through SPSS provides a strong statistical basis for assessing the causal relationship, so that

the findings of this study can be used as a basis for regulators and bank management in formulating risk management policies and sustainable credit growth strategies.

4. Results

The Kolmogorov-Smirnov (K–S) test is used to test whether the research data is normally distributed. Normality is a key requirement in linear regression analysis, as a good regression model assumes that the residual data is normally distributed. From the results of the SPSS calculation, the results were obtained:

Table.1 Kolmogorov-Smirnov Test SPSS Output (K–S)

One-Sample Kolmogorov-Smirnov Test			
		KreditGrowth	NPL
N		12	12
Normal Parameters ^{a,b}	Mean	26.4167	321.8333
	Hours of deviation	24.04714	7.74401
Most Extreme Differences	Absolute	.191	.183
	Positive	.120	.158
	Negative	-.191	-.183
Test Statistic		.191	.183
Asymp. Sig. (2-tailed)		.200 ^{c,d}	.200 ^{c,d}
a. Test distribution is Normal.			
b. Calculated from data.			
c. Lilliefors Significance Correction.			
d. This is a lower bound of the true significance.			

Based on table 1 of the results of the normality test of the One-Sample Kolmogorov-Smirnov Test conducted on two research variables, namely Credit Growth and Non-Performing Loan (NPL), it can be explained that both variables

have a significance value (Asymp. Sig. 2-tailed) of 0.200. This value is well above the significance limit of 0.05 which is used as the basis for decision-making in the normality test.

The results show that the data distribution of the two variables is normal, as it meets the criteria where the significance value is greater than 0.05. Thus, there is no significant difference between the distribution of the research data and the theoretical normal distribution. This means that the distribution of variable data on Credit Growth and Non-Performing Loans (NPL) tends to be symmetrical and does not show extreme skewness to the right or left.

This normal distribution of data has important significance in the context of quantitative research, especially in linear regression analysis. One of the main assumptions in regression is that the data used must be distributed normally so that the results of the regression parameter estimation are unbiased and efficient. Since both variables have met these assumptions, a simple linear regression model can be applied without the need for data transformations, such as logarithms or square roots, to normalize distributions.

In addition, the results of this normality test strengthen the validity of the results of the analysis that will be carried out in the next stage, namely hypothesis testing the influence of Credit Growth on Non-Performing Loans (NPLs). With normal data distribution, the results of the t-test and the value of the determination coefficient (R^2) resulting from the regression analysis in SPSS can later be interpreted statistically with a high level of confidence. Therefore, this normality test is the basis

that the research data is suitable for use in further analysis and can support scientific and accurate hypothesis proofing.

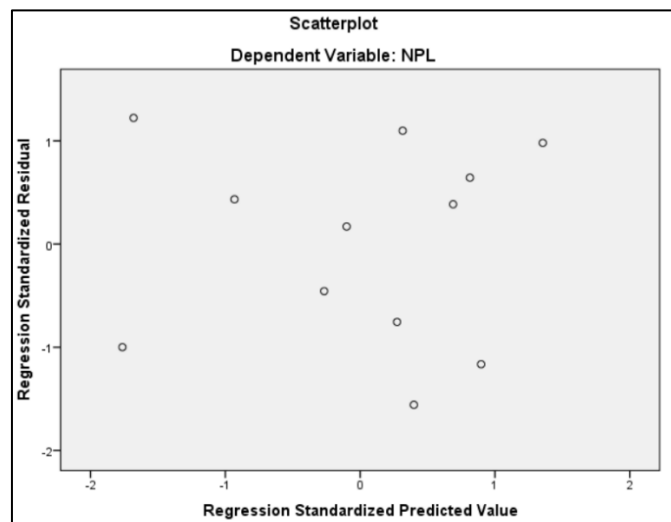


Figure.1 SPSS Output Heteroscedasticity Test

Based on figure 1 of the heteroscedasticity test results displayed through a scatterplot between Regression Standardized Predicted Value (predicted value) and Regression Standardized Residual (residual value), the interpretation can be explained as follows: The heteroscedasticity test is carried out to find out whether there is an inequality of variance from residual at each level of predicted value in the regression model. The basic assumption in linear regression analysis is that residual or prediction errors must have a constant variance (homoscedasticity). If the residual variance is not constant and shows a certain pattern, then heteroscedasticity occurs, which can cause regression results to be inefficient and biased.

From the scatterplot displayed, it can be seen that the residual points are randomly scattered above and below the horizontal line (zero axis) without forming

a specific pattern, either a conical pattern (fan shape) or a widening pattern. The dots are also not concentrated on just one side, but rather spread relatively evenly across the entire chart area. The random spread pattern showed that there were no symptoms of heteroscedasticity in the regression model used. That is, the residual variance is constant for all predicted values (homoscedasticity is met). Thus, a simple linear regression model that tests the effect of Credit Growth on Non-Performing Loans (NPLs) fulfills one of the important assumptions of classical analysis, namely the similarity of error variance.

These results also support the validity of the regression model, so that the estimation of regression parameters can be considered efficient and unbiased. Since the model does not experience heteroscedasticity impairment, the significance tests (t and F tests) that will be performed at the next stage can be legitimately used to test the research hypothesis. In other words, the data used is stable and meets the prerequisites for proceeding with simple linear regression analysis in SPSS without the need for additional transformations or corrections.

The autocorrelation test aims to find out whether there is a relationship (correlation) between the residual (prediction error) in one observation and the residual in another consecutive observation in the regression model. Autocorrelation is generally an issue in time series data, such as the monthly banking data used in this study. If autocorrelation occurs, it violates one of the classic assumptions of regression, which is that errors between periods must be independent (not mutually influential).

Table.2 SPSS Output Autocorrelation Test

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.814 ^a	.663	.629	4.71551	1.850
a. Predictors: (Constant), KreditGrowth					
b. Dependent Variable: NPL					

In table 2 of the output, the Durbin-Watson (DW) value is recorded at 1,850. The DW value theoretically ranges from 0 to 4, with the following interpretation criteria: DW is close to 2 → there is no autocorrelation, $DW < 1.5$ → there is an indication of positive autocorrelation, $DW > 2.5$ → there is an indication of negative autocorrelation.

Thus, the DW value of 1.850 is in the range of 1.5 – 2.5, which means that there are no symptoms of autocorrelation in the regression model between Credit Growth (CreditGrowth) and Non-Performing Loans (NPL). The absence of autocorrelation indicates that errors or residuals are random and independent between periods. This condition indicates that the regression model used has fulfilled one of the important assumptions in classical linear regression analysis. In other words, the fluctuation of NPL data over time is not affected by the value of previous NPLs after accounting for credit growth variables.

These results reinforce the conclusion that the regression model is feasible to use for further analysis. In addition, the value of $R = 0.814$ indicates a fairly strong correlation between credit growth and NPLs, while $R \text{ Square} = 0.663$ indicates that 66.3% of the variation in NPL changes can be explained by changes in credit growth,

while the rest (33.7%) is influenced by other factors outside the model. Based on the whole, the autocorrelation test with a Durbin-Watson value of 1.850 confirms that the regression model does not violate the residual independence assumption, so the hypothesis test results can be considered valid and reliable.

The results of simple linear regression analysis show that there is a strong relationship between Credit Growth (CreditGrowth) as an independent variable and Non-Performing Loan (NPL) as a dependent variable. Based on table 2 (Model Summary), the value of $R = 0.814$ was obtained, which means that the correlation between the two variables is strong and positive. The R-Square value = 0.663 indicates that 66.3% of the variation in changes in NPLs can be explained by the Credit Growth variable, while the remaining 33.7% is explained by other factors outside the model, such as macroeconomic conditions, credit policy, or interest rates. The Durbin-Watson value at thickness 2 of 1.850 also indicates the absence of autocorrelation in the residual model, so the independence assumption is met.

Table.3 Output SPSS Regression Analysis Test (ANOVA)

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	437.306	1	437.306	19.667	.001b
	Residual	222.361	10	22.236		
	Total	659.667	11			
a. Dependent Variable: NPL						
b. Predictors: (Constant), KreditGrowth						

Furthermore, based on table 3 (ANOVA table), the F-value calculated as 19.667 with a significance level of 0.001 (< 0.05) shows that the regression model was formed significantly simultaneously. This means that Credit Growth together with the constant is able to explain the variation in Non-Performing Loans (NPLs) in a meaningful way. Thus, the regression model used is feasible and reliable to explain the relationship between the two variables.

Table.4 SPSS Output Regression Analysis Test (Coefficients)

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	314.907	2.072		151.995	.000		
	KreditGrowth	.262	.059	.814	4.435	.001	1.000	1.000
a. Dependent Variable: NPL								

In the Coefficients table, the following regression equations are obtained:

$$\text{NPL} = 314.907 + 0.262(\text{KreditGrowth})$$

The interpretation of the equation is that when Credit Growth increases by 1 unit, then Non-Performing Loans (NPLs) will increase by 0.262 units, assuming other factors are constant. This positive regression coefficient shows that there is a unidirectional relationship between credit growth and NPL levels, meaning that the higher the credit growth carried out by commercial banks, the greater the potential for an increase in the non-performing loan ratio.

The results of the t-test showed a calculated t-value of 4.435 with a significance level of 0.001 (< 0.05), which means that the Credit Growth variable has a positive and significant effect on NPLs. Thus, the research hypothesis (H_1) is accepted, namely that there is a significant influence between credit growth and the NPL rate of commercial banks in Indonesia.

Based on the whole, the results of this simple linear regression prove that the increase in banking credit must be balanced with prudent risk management policies. If credit expansion is carried out aggressively without considering the quality of the debtor, the NPL ratio has the potential to increase, which can have an impact on the stability of the national banking system.

5. Discussion

The results of the analysis show that credit growth has a positive and significant influence on NPLs, which means that an increase in credit disbursement by commercial banks is followed by an increase in the potential for non-performing loans. These findings are in line with the research of Rachman et al. (2018) which emphasized that aggressive credit growth without strict supervision of debtor quality can pose a risk of default and suppress bank profitability. This positive relationship reflects the trade-off between economic expansion through financing and financial system stability.

The strong correlation between the two variables ($R = 0.814$) and the contribution of 66.3% of the NPL variation explained by credit growth shows how dominant the credit expansion policy is on the quality of banking assets. Thus, credit

growth strategies must pay attention to the principle of prudence (prudential banking). In line with the views of Jessica and Chalid (2021), increasing NPLs can be an endogenous obstacle to credit expansion as increased credit risks encourage banks to tighten lending standards. Therefore, this dynamic creates a two-way relationship, where high credit growth can worsen NPLs, and high NPLs further pressure banks' ability to channel new loans.

External factors also play a role in strengthening this relationship. The COVID-19 pandemic, as highlighted by Hardiyanti and Aziz (2021), has caused great pressure on the financial sector, especially on conventional banks that have large portfolios in the micro and medium business sectors. These external impacts increase the burden of NPLs, even in conditions when credit growth is relatively high. In the macroeconomic context, research by Kartikasary et al. (2020) found that economic growth and interest rates have a significant influence on NPLs, suggesting that credit risk management depends not only on internal policies, but also on national economic conditions.

In addition, these findings confirm the importance of the effectiveness of banking's internal risk management. Shonhadji (2020) emphasized that the Loan to Deposit Ratio (LDR) ratio and the operational efficiency of banks have a major impact on credit stability. When credit expansion is carried out without considering operational capacity and risk management, banks risk experiencing a significant increase in NPLs. Therefore, the role of risk management is crucial in maintaining a balance between credit growth targets and asset quality.

In terms of policy, the results of this study confirm the need for strict supervision of the rate of credit growth so as not to cause an imbalance in the financial system. Regulators such as the Financial Services Authority (OJK) can leverage these results to strengthen macroprudential policies, including the implementation of countercyclical buffers or restrictions on sectors with high credit risk. Thus, banks are expected to be able to distribute credit productively without increasing systemic risks. The conclusion of the results of this analysis indicates that the sustainability of credit growth in Indonesia is not only determined by the ability of banks to disburse funds, but also by the effectiveness of credit risk management in the face of growing economic uncertainty.

6. Conclusion

Based on the results of the analysis and discussion, it can be concluded that credit growth has a positive and significant influence on the level of Non-Performing Loans (NPL) at commercial banks in Indonesia during the period October 2020 – October 2021. The results show that any increase in credit disbursement is followed by an increase in the ratio of non-performing loans, which indicates that credit expansion without being balanced by strong risk management can threaten the financial stability of banks. This reinforces the view that excessive credit growth has the potential to create pressure on the quality of bank assets. In the macroeconomic context, external conditions such as the COVID-19 pandemic have also worsened the NPL ratio due to the weakening of the debtor's ability to meet payment obligations. Therefore, banks need to maintain a balance between financing

expansion strategies and credit risk control by applying prudential banking principles. Regulators also need to strengthen supervisory policies so that the pace of credit growth remains in line with economic conditions and the absorption of the real sector. Overall, the results of this study confirm the importance of a sustainable and controlled credit growth policy as the key to maintaining banking health and supporting a stable national economic recovery.

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