

The Effect of Operating Expenses on Operating Income, Loan-To-Deposit Ratio, and Return on Assets on Non-Performing Loans at Rural Banks with Inflation as an Intervening Variable. (Study on Rural Banks Registered in OJK for the Period 2018-2022)

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ABSTRACT

This study was conducted to measure Operating Costs on Operating Income, Loan to Deposit Ratio, and Return on Assets on Non-Performing Loan at Rural Banks with Inflation as an Intervening Variable using the Rural Banks Financial report data posted on the official OJK web. This study uses secondary data from the financial statements of Banking Companies registered with the OJK for 2018-2022. The sample was taken using a purposive sampling method, which resulted in 15 rural banks registered with OJK in 2018-2022. The data used in this study are quarterly financial reports of 15 companies accessed through the website www.ojk.go.id. Data processing uses SmartPLS for descriptive statistical analysis tests and PLS-SEM analysis. The results of this study indicate that the operating costs on operating income and ROA variables have a positive and significant effect on inflation. In contrast, the LDR variable does not affect inflation. The Operating Costs on Operating Income variable has a positive and significant effect on the NPL variable, while the LDR and ROA variables do not. The inflation variable has a negative influence on the NPL variable. The inflation

variable, as an intervening variable, can mediate the effect of Operating Costs on Operating Income and ROA on NPL on Rural Banks in Indonesia in 2018-2022.

Keywords: Non-Performing Loan, Operating Expenses on Operating Income, Loan to Deposit Ratio, Return on Assets, Inflation.

INTRODUCTION

A Non-Performing Loan (NPL) is a term used in the banking world to describe loans that are substandard, doubtful, or of bad quality (Agustina Y, Agung W, & Ariska D, 2021). NPL is an indicator of asset health in financial institutions, banks, and other financial institutions. The NPL ratio describes the percentage of non-performing loans to total loans owned by financial institutions (Agustina Y, Agung W, & Ariska D, 2021).

The rural bank is a bank financial institution that accepts deposits only in the form of time deposits, savings and other forms equivalent to that and distributes funds in the form of credit or other forms to improve the standard of living of the community and carries out its business activities through conventional principles or based on sharia

principles which in their activities do not provide services in payment traffic (Nurani, 2021). According to Bank Indonesia Regulation Number 23/2/PBI/2021 concerning the Third Amendment to Bank Indonesia Regulation Number 20/8/PBI/2018, Bank Indonesia sets an NPL limit of 5% to maintain the stability of the banking sector (Saleh; Dendi Syahputra; & Eddy Winarso, 2021). The maximum NPL limit for rural banks in Indonesia is the same as the maximum NPL limit for conventional

commercial banks set by Bank Indonesia. Banks with high NPL ratios must overcome problems such as credit restructuring, NPL review, or improved risk management (Harahap Cakranegara, 2021). Banks and other financial institutions need good risk management to overcome NPLs.

The NPL ratio at rural banks increased every year from 2018 to 2022. The data related to the average value of NPL at Rural Banks from 2018 to 2022 can be seen in Table 1.

Table 1. Operating Expenses on Operating Income, LDR, and ROA ratios at rural banks in Indonesia from 2018 to 2022 (%)

Year of	Operating Expenses on Operating Income	LDR	ROA
2018	81,49	76,54	2,48
2019	81,97	79,09	2,31
2020	84,24	75,44	1,87
2021	83,61	73,67	1,78
2022	83,66	75,83	1,74

From table 1, OJK noted an upward trend in NPLs in rural banks. NPL growth in rural banks from 2018 to 2022 has increased yearly. Through PBI No. 15/2/PBI/2013, Bank Indonesia stipulates that the ratio of non-performing loans must be below 5%. To be considered a healthy bank, rural banks need to maintain bad debts to remain ideal according to the regulations set by Bank Indonesia (Riyadi, 2016). In 2018, the NPL ratio increased to 6.37%; in 2019, it increased to 6.81%. Then, in 2020, the NPL ratio increased again to 7.22%. However, in 2021, the NPL ratio in rural banks decreased to 6.72% but remained above the maximum NPL set by Bank Indonesia, and the highest peak in NPL value in 2022 was 7.89%. This high NPL ratio indicates that there are problems in the rural banks. A ratio above 5% may indicate more bad loans than current loans.

There is a knowledge gap or research gap in the literature regarding the effect of operating expenses on operating income, LDR, and ROA on NPLs at rural banks in Indonesia. Although several previous studies have discussed the relationship between these variables, some aspects are

still not revealed or adequately covered, such as limitations in the use of intervening variables, geographical limitations, and trends over a longer period of time. The results of this study are expected to provide input and direction that can help rural banks manage their credit risk and minimize non-performing loans.

LITERATURE REVIEW

Banking Risk Theory

Banking risk theory is a conceptual framework used to analyze the risks faced by financial institutions, especially banks. This theory identifies and manages various risks associated with banking activities, such as credit, liquidity, market, operational, and reputation risks (Philip Best, 2004). The main objective of this theory is to understand, measure, and manage these risks effectively so that banks can maintain financial stability and minimize losses.

NPL is one of the main indicators of credit risk faced by banks. A high level of NPLs can signal problems in the loan portfolio, such as possible defaults or bad debts. Banking risk theory helps banks to identify, measure, and manage this credit risk

effectively by understanding the factors that affect NPL, such as operating expenses on operating income, LDR, ROA and Inflation. A high operating expense on operating income can increase credit risk, while a high LDR can indicate high liquidity risk. Low ROA may indicate underlying profit issues, and inflation may affect the ability of customers to repay their loans. By understanding the relationship between banking risk theory and these factors, banks can manage risk more effectively, minimize NPLs, and maintain financial stability (Ratna Sari Dewi, 2022).

Information Asymmetry Theory (The Market for Lemons)

Information asymmetry theory states that in a transaction, one party has better access or knowledge of relevant information than the other party (Akerlof, 1970). This refers to a situation where the bank needs more information about the borrower's risk than the prospective borrower. This information imbalance may lead to suboptimal behaviour in credit risk assessment. Information asymmetry theory provides a

strong explanation and foundation for how information imbalances between banks and potential borrowers can affect credit risk such as NPLs by taking into account influencing factors such as operating expenses on operating income, LDR, ROA and Inflation.

Information imbalances between banks and potential borrowers can affect credit decision-making, reflected in operating expenses on operating income and LDR. ROA demonstrates the quality of bank assets, while inflation affects purchasing power and credit risk. In this context, asymmetric information theory helps explain how these factors interact and affect NPL rates. A high operating expense on operating income can increase default risk, while a high LDR indicates aggressive lending, which can also increase risk. Low ROA may reflect poor asset quality, while high inflation may lower the value of collateral used by borrowers. Overall, the understanding of asymmetric information theory enriches the analysis of the factors that contribute to NPL rates.

Framework

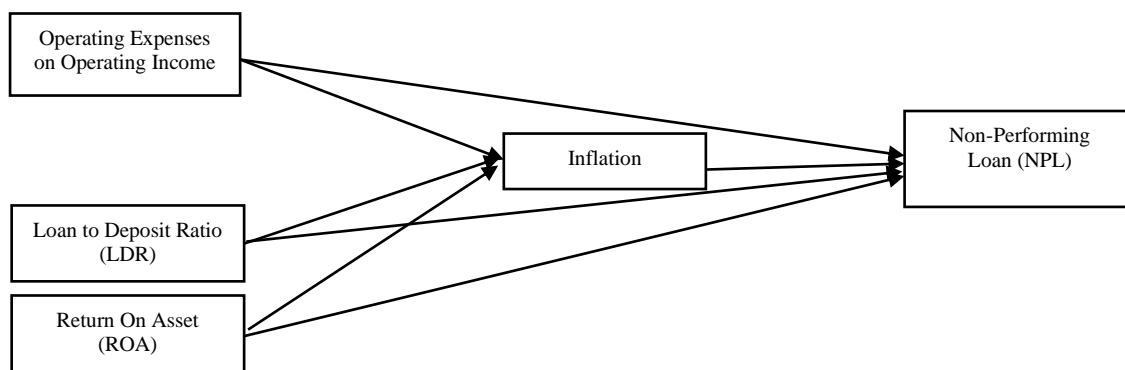


Figure 1. Framework

The hypothesis in this study is as follows.

H1: Operating Expenses on Operating Income has a positive and significant effect on inflation at rural banks in Indonesia.

H2: Loan to Deposit Ratio (LDR) has a positive and significant effect on inflation in rural banks in Indonesia.

H3: Return On Asset (ROA) has a positive and significant effect on inflation in rural banks in Indonesia.

H4: Operating Expenses on Operating Income has a positive and significant effect on Non-Performing Loans (NPL) at rural banks in Indonesia.

H5: Loan to Deposit Ratio (LDR) has a positive and significant effect on Non-

Performing Loan (NPL) at rural banks in Indonesia.

H6: Return On Asset (ROA) has a negative effect on Non-Performing Loan (NPL) at rural banks in Indonesia.

H7: Inflation has a negative effect on Non-Performing Loan (NPL) at rural banks in Indonesia.

H8: The role of inflation can mediate the effect of Operating Costs on Operating Income on Non-Performing Loans (NPL) at rural banks in Indonesia.

H9: The role of inflation can mediate the effect of Loan to Deposit Ratio (LDR) on Non-Performing Loan (NPL) at rural banks in Indonesia.

H10: The role of inflation can mediate the effect of Return on Asset (ROA) on Non-Performing Loan (NPL) at rural banks in Indonesia.

MATERIALS & METHODS

This research is a quantitative study using secondary data. This secondary data is obtained through library and internet research data collection techniques. Library research is a method of collecting data obtained from books and literature related to this research's subject matter, such as journals. Internet research is a search for research data by utilizing internet media so that the data obtained is up to date by looking at data on the development of NPL, Operating Costs on Operating Income, LDR, ROA and Inflation for the period 2018 to 2022 obtained from the official website of the Otoritas Jasa Keuangan.

This research was conducted at rural banks registered with the Otoritas Jasa Keuangan. The research time starts in 2018 and will continue until 2022. The population in this study is Indonesian banking companies listed on the OJK website as of December 2023, namely 1,405 banks. Sampling for use in this study was determined after obtaining several criteria. The sampling technique uses purposive sampling, namely determining the sample for certain considerations. In other words, data

collection has been adjusted based on a predetermined assessment. The determination of this sample is adjusted to the needs and concerns of researchers such as rural banks listed on the official OJK website from 2018 to 2022, rural banks that publish complete and regular quarterly financial reports during 2018 to 2022, companies that are rural banks during 2018 to 2022 and rural banks located in the North Sumatra region. Based on these sample criteria, 15 rural banks were found.

Researchers use the inferential statistical analysis method to analyze samples from the population whose results will be applied in general. The test tool used is SEM (Structure Equation Modelling). SEM is a type of multivariate analysis that aims to simultaneously process several variables on the object under study. The type of SEM used is PLS (Partial Least Square).

RESULT

The descriptive statistical description of the 300 observations in this study is the operating costs on operating income variable has a minimum value of 60.45 and a maximum value of 141.79, with the average value obtained in the operating costs on operating income variable of 82.4261 with a standard deviation of 10.001. The LDR variable has a minimum value of 13.60 and a maximum value of 126.93, with the average value obtained in the LDR variable being 73.7217 with a standard deviation of 17.333. The ROA variable has a minimum value of 0.03 and a maximum value of 12.03, with the average value obtained in the ROA variable being 4.230 with a standard deviation of 2.487. The Inflation variable has a minimum value of 1.68 and a maximum value of 5.51, with the average value obtained in the Inflation variable being 2.982 with a standard deviation of 1.374. Finally, the NPL variable has a minimum value of 0.01 and a maximum value of 36.51, with the average value obtained in the NPL variable being 5.534 with a standard deviation of 7.108.

The Outer Model PLS-SEM

All indicators used in the operating costs on operating income, LDR, ROA, inflation and NPL variables have a loading factor value greater than 0.7. This indicates that all indicators in these variables have a high level of validity, thus fulfilling convergent

validity. It can be seen by looking at the Heterotrait-Monotrait Ratio (HTMT) value to evaluate discriminant validity. The HTMT value < 0.9 is considered to show good discriminant validity. This study presents the HTMT value for each variable in the following table.

Table 2. Discriminant Validity Test Result

	Operating Costs on Operating Income	LDR	ROA	Inflation	NPL
Operating Costs on Operating Income					
Inflation	0.115				
LDR	0.107	0.021			
NPL	0.611	0.036	0.191		
ROA	0.523	0.064	0.254	0.216	

Besides using the HTMT value, Discriminant Validity testing can also be seen based on the Average Variance Extracted (AVE) value. A good model must have an AVE value greater than 0.5. This study presents the AVE value for each variable in the following table. It is known

that the AVE value for each variable, namely operating costs on operating income, LDR, ROA, inflation, and NPL, is greater than 0.5. Thus, each variable in this research model has good discriminant validity.

Table 3. AVE Score Test Results

	Average Variance Extracted (AVE)
Operating Costs on Operating Income	1.000
LDR	1.000
ROA	1.000
Inflation	1.000
NPL	1.000

A variable can be declared reliable if its Cronbach's alpha value is > 0.7 . The data in the table below show that each research variable's Cronbach's alpha value is greater

than 0.7. Thus, these results show that each research variable has a high level of reliability.

Table 4. Cronbach's Alpha Test Result

	Cronbach's Alpha
Operating Costs on Operating Income	1.000
LDR	1.000
ROA	1.000
Inflation	1.000
NPL	1.000

The composite reliability value for all research variables, namely operating costs on operating income, LDR, ROA, inflation and NPL, is greater than 0.7 (> 0.7). These

results indicate that each variable meets the composite reliability, so it can be concluded that all variables have a good level of reliability.

Table 5. Composite Reliability Test Result

	<i>Composite Reliability</i>
Operating Costs on Operating Income	1.000
LDR	1.000
ROA	1.000
Inflation	1.000
NPL	1.000

The Inner Model PLS-SEM

After testing the outer model, the inner model (structural model) is the next test. Inner model testing is done by looking at the path coefficient value, r-square. The higher the r-square value, the better the prediction model of the proposed research model. Meanwhile, the path coefficient value shows the ability of the independent variables to influence the dependent variable.

Evaluation of the path coefficient is used to show how strong the effect or influence of the independent variable is on the dependent variable. When the path coefficient value of one independent variable on the dependent

variable is greater, the influence of the independent variable on the dependent variable is stronger. The table below shows that the independent variables used in this research model, namely operating costs on operating income and ROA, have a path coefficient with a positive value on inflation. At the same time, LDR has a negative coefficient value on inflation. operating costs on operating income and ROA variables have a path coefficient with a positive value on NPL. While LDR and inflation have a negative coefficient value for NPL.

Table 6. Path Coefficient Test Result

	Original Sample (O)
Operating Costs on Operating Income -> Inflation	0.221
Operating Costs on Operating Income -> NPL	0.681
LDR -> Inflation	-0.052
LDR -> NPL	0.088
ROA -> Inflation	0.193
ROA -> NPL	0.126
Inflation -> NPL	-0.124

The R-Square value obtained in this research model is 0.410. The acquisition of this value explains that the percentage of NPL magnitude, which can be explained by operating costs on operating income, LDR, ROA, and inflation, is 41%. The rest is explained by other variables that were not used in this study. These results include the R-Square value obtained in the moderate model category.

Table 7. R-Square Test Result

	R Square	R Square Adjusted
Inflation	0.037	0.027
NPL	0.410	0.402

Hypothesis testing in this study was carried out by looking at the P-values of each independent variable on the dependent variable. The research hypothesis can be declared accepted if the P-values score <0.05. From partial hypothesis testing, it is stated that hypothesis 1, hypothesis 3, hypothesis 4 and hypothesis 7 are accepted. On the contrary, hypothesis 2, hypothesis 5 and hypothesis 6 are rejected.

Table 8. Partial Hypothesis Test Result

	T Statistics (O/STDEV)	P Values
Operating Costs on Operating Income -> Inflation	2.661	0.008
LDR -> Inflation	0.841	0.401

ROA -> Inflation	2.499	0.013
Operating Costs on Operating Income -> NPL	6.915	0.000
LDR -> NPL	1.782	0.075
ROA -> NPL	1.745	0.082
Inflation -> NPL	3.269	0.001

Furthermore, testing the hypothesis relating to the indirect effect of the independent variable on NPL through the intervening variable, namely inflation, shows that inflation can mediate the effect of operating costs on operating income and ROA on the

company's NPL. Other results show that inflation cannot mediate the effect of LDR on NPL. Therefore, hypothesis 8 and hypothesis 10 are accepted, while hypothesis 9 is rejected.

Table 9. Intervening Hypothesis Testing Result

	T Statistics (O/STDEV)	P Values
Operating Costs on Operating Income -> Inflation -> NPL	2.093	0.037
LDR -> Inflation -> NPL	0.860	0.390
ROA -> Inflation -> NPL	1.976	0.049

DISCUSSION

The first hypothesis in this study states that operating costs on operating income has a positive and significant effect on inflation at rural banks in Indonesia in 2018-2022. when operating costs on operating income increases, this indicates that the bank's operational costs, such as employee salaries, administrative costs, and maintenance costs, are also increasing. So, to maintain profitability, banks need to find ways to offset these higher operating costs. This encourages banks to raise lending rates to balance the increased costs, which results in higher borrowing costs for customers (borrowers). Consumers and businesses facing higher interest rates tend to reduce spending and investment activities, which can depress economic activity (Rasyidin, et al., 2023). However, on the other hand, an increase in interest rates also increases the interest income received by rural banks, leading to more money in circulation in the community. This increase in money in circulation can trigger higher aggregate demand, which can drive inflation. The results obtained in this study are in line with the results of previous research conducted by Setiawan (2018) which states that operating costs on operating income is

proven to have a positive and significant effect on inflation.

The second hypothesis in this study states that LDR has a positive and significant effect on Inflation at rural banks in Indonesia in 2018-2022. when the bank's LDR increases, and the bank will lend more to its customers, this will not trigger inflation. This can happen when the monetary policy implemented by the central bank is effective in controlling inflation, so that even though the LDR at the bank increases, the effect on inflation can be muted by interest rate policy or other monetary instruments. In addition, when loans are not used productively or do not contribute significantly to aggregate demand, the impact on inflation will be minimal. This means that even though banks are lending more (as indicated by an increase in LDR), the money does not directly increase the demand for goods and services in the market and therefore does not cause a significant increase in prices.

The third hypothesis in this study states that ROA has a positive and significant effect on Inflation at rural banks in Indonesia in 2018-2022. ROA is able to measure how efficient the bank is in generating profits from its total assets (Tanaya, 2023). So that ROA has an important role in assessing

bank performance because it provides an overview of the bank's ability to manage its assets optimally to generate profits. ROA is able to measure how efficient the bank is in generating profits from its total assets (Tanaya, 2023). So that ROA has an important role in assessing bank performance because it provides an overview of the bank's ability to manage its assets optimally to generate profits.

The fourth hypothesis in this study states that operating costs on operating income has a positive and significant effect on NPLs at rural banks in Indonesia in 2018-2022. When operating costs on operating income increases, it often indicates that the bank is facing high operational pressure. So that it can interfere with the bank's ability to monitor and assess credit risk effectively. Lack of efficient operational cost management can lead to inadequate resource allocation for careful credit monitoring activities, which ultimately increases the risk of non-performing loans or NPLs. The results obtained in this study are in line with the results of previous research conducted by Erick (2016).

The fifth hypothesis in this study states that LDR has a positive and significant effect on NPLs at rural banks in Indonesia in 2018-2022. The test results in this study found that LDR had a negative but insignificant effect on NPLs at rural banks in Indonesia from 2018 to 2022. So, the fifth hypothesis is rejected. Effective credit risk management is a key factor in maintaining banks' stability and financial health, especially when LDR increases. When LDR increases, banks have expanded lending compared to the funds available in deposits. This may increase the bank's exposure to credit risk as the bank becomes more vulnerable to potential defaults from borrowers. However, effective credit risk management can help banks mitigate the potential impact of increased LDR on NPL levels.

This is because a good risk management system allows the bank to identify potential risks in the borrower's loan portfolio

correctly. This involves careful analysis of the credit profile of each borrower, including their eligibility and ability to repay the loan. With good risk management, banks can take preventive measures to reduce credit risk, such as tightening underwriting policies or increasing regular monitoring of credit quality. This allows the bank to adjust its loan portfolio proactively and avoid a significant increase in potentially non-performing loans (NPLs). The results obtained in this study align with previous research conducted by Permatasari and Susilo (2023).

The sixth hypothesis in this study states that ROA has a negative and significant effect on NPLs at rural banks in Indonesia in 2018-2022. The test results in this study found that ROA had a positive but insignificant effect on NPLs at rural banks in Indonesia from 2018 to 2022. So, the sixth hypothesis is rejected. Although the Return on Assets (ROA) at rural banks is high, it does not directly guarantee that the level of Non-Performing Loans (NPL) owned by rural banks is low. Because even though a high ROA indicates that the bank has been efficient in generating profits, this cannot guarantee that the NPL rate will always be low. In other words, even though the bank has a high level of efficiency in generating income, poor credit decisions or inaccurate risk assessment can result in a poor credit portfolio. So, NPLs will still increase even when the bank has a high ROA. The results obtained in this study align with the results of previous research conducted by Pardosi et al. (2024).

The seventh hypothesis in this study states that inflation has a negative and significant effect on NPLs at rural banks in Indonesia in 2018-2022. The test results in this study found that inflation was proven to have a negative and significant effect on NPLs at rural banks in Indonesia in 2018-2022. So, the seventh hypothesis is accepted. High inflation often occurs in situations where economic activity is growing rapidly. This can be caused by factors such as strong

consumer demand, high investment, or even the growth of specific industrial sectors. Under these circumstances, individual and corporate incomes generally increase. Therefore, customers or borrowers have more resources to fulfil their loan repayment obligations. In addition, the central bank will also respond to high inflation by raising interest rates. This policy is designed to curb inflation by reducing the availability of money in circulation and stimulating savings. This causes new loans to be more expensive and encourages customers to be more careful when taking additional loans, thereby reducing the potential for NPLs in rural banks. The results obtained in this study align with the results of previous research conducted by Rohadi et al. (2024). The eighth hypothesis in this study states that inflation as an intervening variable can mediate the effect of operating costs on operating income on NPLs at rural banks in Indonesia in 2018-2022. The test results in this study found that inflation as an intervening variable could mediate the effect of operating costs on operating income on NPLs at rural banks in Indonesia from 2018 to 2022, so the eighth hypothesis is accepted. Where high inflation often occurs when economic activity is growing rapidly. Various factors, such as strong consumer demand, high levels of investment, or the growth of certain industrial sectors, can cause this. In such a situation, individual and corporate incomes generally increase, giving customers or borrowers more resources to meet loan repayment obligations. In addition, the central bank will respond to high inflation by raising interest rates. This policy is designed to ease inflation by reducing the availability of money in circulation and encouraging savings. As a result, new loans are more expensive and enable customers to be more cautious in taking out additional loans, reducing the potential for NPLs in rural banks (Hamdi, 2023). The ninth hypothesis in this study states that inflation as an intervening variable can

mediate the effect of LDR on NPLs in rural banks in Indonesia in 2018-2022. In the test results of this study, it was found that inflation as an intervening variable could not mediate the effect of LDR on NPL at rural banks in Indonesia from 2018 to 2022. So, the ninth hypothesis is rejected. When banks have a high LDR level and channel more loans to their customers, inflation does not have a direct impact. This could be because the monetary policy implemented by the central bank is quite effective in controlling inflation, so even if the LDR of rural banks increases, the effect on inflation can be overcome through interest rate setting or other monetary instruments. Moreover, if the loans are not used productively or do not contribute significantly to aggregate demand, the impact on inflation will be minimal. In other words, even though banks increase the amount of loans disbursed (as reflected in an increase in LDR), the money provided does not directly increase the demand for goods and services in the market, hence not causing inflation. Because the level of money distribution in society does not increase (no inflation), customers' ability to pay their debts will remain the same. This is different when inflation occurs when the ability to pay customer debts increases because inflation can increase people's income. So, this is what causes inflation to be unable to mediate the effect of LDR on NPL in rural banks. The results obtained in this study are supported by the research conducted by Anisyana et al. (2023). The tenth hypothesis in this study states that inflation as an intervening variable can mediate the effect of ROA on NPLs in rural banks in Indonesia in 2018-2022. The test results in this study found that inflation as an intervening variable could mediate the effect of ROA on NPL on rural banks in Indonesia from 2018 to 2022. Thus, the tenth hypothesis is accepted. When the bank has a higher ROA level, this indicates that

the bank has managed assets more efficiently and can generate greater profits (Rohmandika et al., 2023). With higher profits, banks can offer lower loan interest rates to customers. This reduction in interest rates makes loans more affordable for people, which can stimulate economic activity by allowing more people to access credit. With easier and cheaper credit, people can use the loans for consumption or investment activities, thus boosting market demand for goods and services and causing inflation.

When inflation occurs, individual and corporate income tends to increase, giving debtors more resources to pay and repay loans to banks. In addition, the central bank will also respond to inflation by raising interest rates, which aims to reduce the inflation rate by reducing the availability of money and encouraging people to save. This can make new loans more expensive, encouraging customers to be more cautious in taking out additional loans and ultimately reducing potential NPLs at banks (Hamdi, 2023).

CONCLUSION

The results of this study provide several conclusions that can be drawn based on the discussion of the problems that have been done. Among others, operating expenses on operating income and Return on Assets (ROA) had a positive and significant effect on inflation in rural banks in Indonesia in 2018-2022, while Loan to Deposit Ratio (had) had no effect on inflation at rural banks in Indonesia in 2018-2022. Operating expenses on operating income positively and significantly affect Non-Performing Loans (NPL) at rural banks in Indonesia in 2018-2022. On the contrary, Loan Deposit Ratio (LDR) and Return on Asset (ROA) did not affect NPLs at rural banks in Indonesia in 2018-2022. Inflation negatively and significantly affected NPLs at rural banks in Indonesia in 2018-2022. For intervening tests, the role of inflation can mediate the effect of operating expenses on

operating income and Return on Asset (ROA) on Non-Performing Loan (NPL) at rural banks in Indonesia in 2018-2022, and the role of inflation cannot mediate the effect of Loan to Deposit Ratio (LDR) on Non-Performing Loan (NPL) at rural banks in Indonesia in 2018-2022. Practical contributions that can result from research focus on more effective policies in maintaining operational efficiency and financial stability. The results of this study encourage rural banks to pay more attention to operational cost efficiency to increase operating income and optimize LDR and ROA. In addition, by considering the impact of inflation, rural banks can be more proactive in anticipating changes in economic conditions that may affect credit quality. Overall, the findings of this study can be used as strategic guidance for rural banks in improving their performance and reducing credit risk, thereby strengthening their position in the banking industry. For important theoretical contributions in finance and banking, this study is specifically related to managing operating expenses, LDR, and ROA on NPLs in rural banks. This study enriches the literature on how internal bank factors interact with macroeconomic conditions in influencing credit quality by including inflation as an intervening variable. The results of this study can deepen the understanding of the mechanism and causal relationship between operational efficiency, financial ratios, and credit risk, as well as provide a more comprehensive theoretical framework for credit risk management in banking. In addition, the findings can be used as a basis for further research exploring additional factors or different contexts, thus contributing to developing stronger theories in banking financial management.

Research Limitations

This study is limited by its scope. The dependent variable used is Non-Performing Loan (NPL). The independent variables used include Operating Expenses on

Operating Income, Loan to deposit Ratio (LDR) and Return on Assets (ROA). In addition, this study also includes intervening variables, namely inflation. The object of this research is rural banks in North Sumatra from 2018 to 2022.

Suggestion

Based on the results obtained in this study, it can be seen that operating costs on operating income and Inflation are proven to influence the company's NPL significantly. The operating costs on operating income can affect NPL positively, while inflation affects NPL negatively. For this reason, it is recommended that rural banks develop an effective operating costs on operating income management strategy to reduce its impact on NPLs. Some of the things that rural banks can do include operational efficiency, diversification of income sources, or more effective cost control. In addition, with the high level of inflation, rural banks can take strategic steps to maintain their financial stability to reduce the potential credit risk arising from changes in macroeconomic factors such as inflation. Future research can be conducted to expand the scope of the study on rural banks in Indonesia because this can provide a more comprehensive picture of the variables that affect NPLs at rural banks. The research period is limited, requiring an increase in the range of research periods associated with macroeconomic conditions in a particular year to obtain a comprehensive analysis. It is hoped that future researchers will improve the different test results, which align with and can reflect the effect test in the study.

Declaration by Authors

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