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DO CAR, CASH RATIO, OER AND LDR HAVE AND LDR HAVE AN EFFECT ON NPL?

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Abstract

This study seeks to examine the impact of Conventional Rural Credit Banks (BPR) in the Former Pekalongan Residency Area by analyzing various factors, including CAR, Cash Ratio, OER, and LDR, on NPL. This study uses quantitative data with purposive sampling method, the population is 30 Conventional BPRs and the research sample is 14 Conventional BPRs in the Ex-Pekalongan Residence Area. This data is processed using SPSS 22. This study's findings suggest that CAR and the Cash Ratio do not significantly impact NPL. However, both OER and LDR demonstrate a positive correlation with NPL. This research provides benefits for Conventional BPRs in the Pekalongan Ex-Residency Area. This study's findings deliver valuable knowledge and insights to Conventional BPRs in the Pekalongan Ex-Residency to support their credit or loan provision activities. With this research, it is hoped that Conventional BPRs will be more careful and more selective in providing credit to customers so that there are no NPLs or bad debts. The scope of this research is limited to Conventional Rural Banks (BPRs) operating within the former Pekalongan Regency between 2019 and 2023. Consequently, the findings should not be extrapolated to other regions with dissimilar characteristics.

Keywords: CAR; Cash Ratio; LDR; OER; NPL

Abstrak

Penelitian ini bertujuan untuk mengkaji dampak Bank Perkreditan Rakyat (BPR) Konvensional di Wilayah Eks-Karesidenan Pekalongan dengan menganalisis berbagai faktor, termasuk CAR, Cash Ratio, OER, dan LDR, terhadap NPL. Penelitian ini menggunakan data kuantitatif dengan metode purposive sampling, populasinya adalah 30 BPR Konvensional dan sampel penelitiannya adalah 14 BPR Konvensional di Wilayah Eks-Karesidenan Pekalongan. Data ini diolah menggunakan SPSS 22. Temuan penelitian ini menunjukkan bahwa CAR dan Cash Ratio tidak berpengaruh signifikan terhadap NPL. Namun, baik OER maupun LDR menunjukkan korelasi positif dengan NPL. Penelitian ini memberikan manfaat bagi BPR Konvensional di Wilayah Eks-Karesidenan Pekalongan. Temuan penelitian ini memberikan pengetahuan dan wawasan yang berharga bagi BPR Konvensional di Wilayah Eks-Karesidenan Pekalongan untuk mendukung kegiatan pemberian kredit atau pinjaman mereka. Dengan penelitian ini, diharapkan BPR Konvensional akan lebih berhati-hati dan selektif dalam menyalurkan kredit kepada nasabah sehingga tidak terdapat kredit bermasalah (NPL) atau kredit macet. Cakupan penelitian ini terbatas pada Bank Perkreditan Rakyat Konvensional (BPR) yang

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beroperasi di wilayah Kabupaten Pekalongan antara tahun 2019 dan 2023. Oleh karena itu, temuan ini tidak dapat diekstrapolasi ke wilayah lain dengan karakteristik yang berbeda.

Kata Kunci: CAR; Rasio Kas; LDR; BOPO; NPL

1. INTRODUCTION

In the era of globalization, banking business competition is very tight. The competition is not only between banks, but also comes from other financial institutions that have succeeded in developing new financial products. The very rapid competition in the banking world makes each banking institution compete to win the business competition. Competition between banks will certainly benefit customers because customers can choose various banking services offered. The quality of banking products and services plays a crucial role in determining whether a banking institution can compete in the global market. The key requirement for banking institutions is their ability to deliver products and services that align with the needs and preferences of the community. The management of a bank demands speed and accuracy in responding to what the community needs today.

As a service company, banking companies must be oriented towards the quality of service provided. The services provided must be able to create satisfaction for its customers. Customer satisfaction offers several advantages, including fostering stronger company-customer relationships, establishing a foundation for repeat business, cultivating customer loyalty, and potentially generating positive word-of-mouth referrals, all of which can attract more customers to the company's products (Dendawijaya, 2009).

The Rural Credit Bank (BPR) is a financial institution specifically tasked with supporting Small to medium-sized businesses (SMBs) and the community through the distribution of credit. BPR Central Java Province has distributed credit to the community classified into four economic sectors, namely the industrial processing sector, the agricultural sector, the wholesale and retail trade sector, and the household sector. Distribution of funds in the form of credit has the potential to pose risks that threaten the health level of BPR. A key risk is that of non-performing or troubled loans, often represented by the Non-Performing Loan (NPL) ratio. This ratio is determined by dividing the total value of non-performing loans by the total value of outstanding loans. Bank Indonesia has set a maximum limit of 5% net NPL to be said to be a healthy bank. If it exceeds 5%, then the bank has the potential to experience bad credit.

Based on the Central Java Province Regional Economic and Financial Study Report of Bank Indonesia in February 2022, it shows that the NPL rate of Conventional BPRs in the Ex-Pekalongan Residency Area during the 2019-2023 period has a fluctuating pattern, but is consistently above 5%. Likewise, the problems that occurred in BPRs in Tegal Regency were 4 and Tegal City had 1, Brebes Regency had 3, then Pekalongan City had 3, Pekalongan Regency had 2 while Batang Regency had 1 BPR which had an NPL ratio above 5%. The data is presented in Table 1 below.

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Table 1. Development of NPL Level

Nama BPR	2019	2020	2021	2022	2023
BPR Nusamba Adiwerna	10,84%	10,04%	5,68%	9,03%	11,98%
BPR Nusumma Jateng	7,6%	7,48%	7,47%	8,82%	7,99%
BPR Dhana Adiwerna	3,71%	5,47%	3,55%	4,81%	10,62%
BPR Artha Puspa Mega	5,92%	9,32%	7,75%	12,32%	12,3%
BPR BKK Kota Tegal	5,46%	5,18%	2,76%	3,88%	11,23%
BPR BKK Banjarharjo	4,68%	7,42%	5,77%	8,25%	11,83%
BPR Bank Brebes	5,11%	8,42%	5,71%	8,39%	10,05%
BPR Bumiayu Bangun Citra	7,98%	13,5%	6,17%	17,63%	16,05%
BPR Arta Utama	3,55%	4,07%	3,37%	6,18%	10,71%
BPR BKK Kota Pekalongan	5,31%	4,32%	2,84%	10,24%	11,73%
BPR Bank Pekalongan	3,5%	2,74%	6,06%	12,52%	12,62%
BPR Hidup Artha Putra	3,48%	10,14%	6,4%	6%	4,34%
BPR BKK Taman	4,47%	5,04%	5,4%	8,05%	9,91%
BPR Pemberdayaan Ekonomi Rakyat	7,95%	3,68%	2,96%	5,96%	5,43%

Source: ojk.go.id

Based on this phenomenon, an appropriate effort is needed to control the NPL level so that the performance of Conventional BPRs in the Ex-Pekalongan Residency Area is much better. One effort that can be made is through a study of the dominant factors that influence NPL. This study's findings aim to assist BPR management in maintaining a stable NPL level, ideally below the 5% threshold. There are various factors that influence the high or low NPL level of a Bank. Key determinants of NPL include the Capital Adequacy Ratio (CAR), Cash Ratio, Loan-to-Deposit Ratio (LDR), and Operating Efficiency Ratio (OER).

2. LITERATURE REVIEW

CAR indicates how much capital a bank has on hand. The more efficiently a bank utilizes its capital for operational activities, the better it can expand credit provision, thus reducing the risk levels within the bank. The study by (Barra & Ruggiero, 2023) indicates that CAR negatively impacts NPL. As the Capital Adequacy Ratio (CAR) rises, the bank's ability to reduce credit risk increases, making the credit threshold at that particular bank more favorable. This is because the bank is trusted to manage its operational activities so that the public may trust that the money given can be used effectively and that it can be refunded if necessary (Yuliani et al., 2020). However, these findings diverge from those of (Rahman et al., 2023), (Madugu et al., 2020), (Khan et al., 2020) and (Wahyudi, 2020), who posit a positive relationship between the Capital Adequacy Ratio (CAR) and Non-Performing Loans (NPL). Nevertheless, this research differs from the studies conducted by (Alnabulsi et al., 2022), (Suryani & Africa, 2021), (Wulandari et al, 2021), (Okyere & Mensah, 2022), (Singh at al., 2021), (Erdas & Ezanoglu, 2022), (Asyadiah., N & Hasanuh., N 2023), (Annas et al., 2024) and (Naili & Lahrichi 2022), which assert that CAR negatively impacts NPL.
H1: CAR exhibits a negative influence on NPL.

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The cash ratio is a metric utilized to evaluate the amount of cash available to a company for fulfilling its debt obligations. It serves as an indicator of the company's capacity to use its cash to repay debt. This ratio compares the total cash held by the company to its current liabilities. A higher level of cash or cash equivalents indicates a stronger ability to meet short-term debt commitments (Khairani F, dkk 2020). The study by (Alrowaiei et al., 2021) and (Pervez et al., 2023) reveals that the cash ratio positively influences NPL. As a bank's assets increase, its capacity to extend credit also grows. While (Jalali et al., 2023) and (Abbas et al., 2021) suggest that the cash ratio is negatively associated with NPL, this study's results contradict this assertion.

H2: The Cash Ratio has a positive impact on NPL.

The Loan to Deposit Ratio (LDR) measures how much a financial institution relies on deposits to fund its lending activities (Boďa, M., & Zimková., E, 2021). Banks can use the available capital to judiciously disburse productive credit when the LDR falls between 78% and 92%. The quality of the credit portfolio is generally improved by well-managed credit distribution (Salim, M. N., & Mundung, L. O. 2020). Research by (Malik, 2020), (Jalali et al., 2023) and (Prasanth et al., 2020) indicates a negative correlation between LDR and Non Performing Loans (NPLs). The greater the LDR ratio indicates the more credit provided by the bank concerned, the greater the total credit will cause the smaller the NPL ratio produced so that the relationship between the NPL ratio is smaller. However, the findings of this study contrast with those of (Kumar, V., & Bird 2022), (Muhammad, R., Suluki, A., & Nugraheni 2020), (Karadima M., & Louri, 2021) and (Chun 2024), which suggest that LDR positively affects NPL.

H3: There is a negative correlation between LDR and NPL.

The Operating Expense Ratio (OER) measures the (Asyadiah, N., & Hasanuh, N., 2023) proportion of operating costs incurred relative to the operating income generated. Operating costs are a crucial measure of a bank's operational efficiency and its ability to manage its core business activities effectively (Kumar, V., & Bird 2022). Problematic loan levels may rise in response to higher operating expenses relative to revenue. This is due to the fact that operational inefficiencies might result in increased expenses, which might not be viable if revenues do not rise in line with them (Asyadiah, N., & Hasanuh, N., 2023). Research conducted by (Jalali et al., 2023), (Prasanth et al., 2020), (Nurwulandari et al., 2022) and (Suryani, & Africa, 2021) suggests a positive correlation between OER and Non-Performing Loans (NPLs). A lower OER signifies greater operational efficiency, as it indicates that the bank effectively manages its operating expenses. This enhanced efficiency can contribute to a reduced likelihood of non-performing loans. Notwithstanding, the present study's findings are inconsistent with those reported by (Istan, M., & Fahlevi 2020), (Khan et al., 2020) and (Pardosi et al., 2024) who demonstrated a negative correlation between OER and NPLs.

H4: There is an inverse relationship between OER and NPL.

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3. RESEARCH METHOD

This research is quantitative in nature, involving an empirical study on conventional Rural Credit Banks (BPR) in the Ex-Pekalongan Residency Area from 2019 to 2023. This research encompassed all 30 conventional Bank Perkreditan Rakyat (BPRs) operating within the former Pekalongan Residency Area between 2019 and 2023. A total of 14 BPRs within this population were selected as the study sample based on specific inclusion criteria.

The sample in this study was selected purposively by paying attention to certain criteria, namely:

a. All conventional BPRs in the Ex-Residency of Pekalongan that provide complete financial reports during 2019 to 2023.
b. All conventional BPRs in the Ex-Residency of Pekalongan that have an NPL ratio above 5% during the observation year.
c. All conventional BPRs in the Ex-Residency of Pekalongan whose financial reports have been audited during 2019 to 2023.
d. All conventional BPRs in the Ex-Residency of Pekalongan that are registered with Bank Indonesia during 2019 to 2023.

This research employed two data collection methods: document analysis and literature review. Documentation involved gathering secondary data, such as financial statements and annual reports, retrieved from the official website of the Indonesian Financial Services Authority (OJK) at www.ojk.go.id. The collected data was then processed using computerized techniques, specifically with the help of SPSS 22 software.

Data analysis in this study involved several techniques. Descriptive statistics were employed to summarize the data. Classical assumptions were tested to ensure the validity of subsequent analyses. Multiple linear regression analysis was employed to explore the relationships between variables. Individual predictor significance was tested with t-tests, and overall model fit was evaluated using F-tests and R-squared.

4. DATA ANALYSIS AND DISCUSSION

Table 2. Results of Descriptive Statistical Tests

	N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
CAR	70	11,43	132,88	41,5533	25,11042
Cash Ratio	70	7,17	79,53	24,5589	14,36244
LDR	70	48,73	148,83	83,5877	16,97531
OER	70	66,84	105,27	84,9257	7,98411
NPL	70	2,74	17,63	7,3877	3,36810
Valid N (listwise)	70				

Table 2 the descriptive statistics indicate that the average NPL was 7.3877% with a standard deviation of 3.36810%, suggesting relatively low variability in NPL

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levels during the observation period. Similarly, the average Capital Adequacy Ratio (CAR) was found to be 41.5533% with a standard deviation of 25.11042%. The relatively low standard deviation of 25.11042% for CAR suggests limited variation in capital adequacy levels among the observed banks. The average Cash Ratio was 24.5589% with a standard deviation of 14.36244%, indicating relatively stable cash holdings. Finally, the average Loan-to-Deposit Ratio (LDR) was 83.5877% with a standard deviation of 16.97531%, suggesting moderate variability in lending activities. The relatively low standard deviation of 16.97531% for LDR suggests moderate variability in lending activities. Finally, the average Operating Expense Ratio (OER) was 84.9257% with a standard deviation of 7.98411%, suggesting relatively low variability in operating expenses among the observed banks.

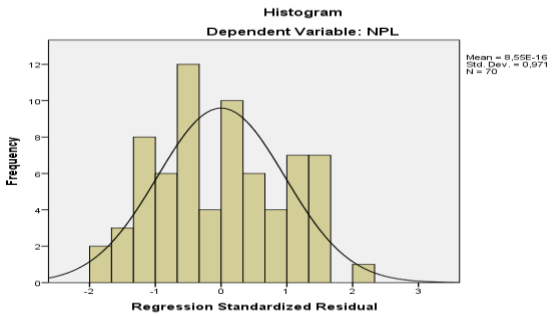

Figure 1. Histogram Graph

Figue 1 the histogram displays a bell-shaped curve, suggesting a normal distribution of the data. This is evident from the relatively even spread of data points across the graph, aligning with the expected pattern of a normal distribution. Consequently, the regression model satisfies the assumption of normality.

Table 3. Results of the Kolmogorov-Smirnov Test

		Standardized Residual
N		70
Normal Parameters[a,b]	Mean	,0000000
	Std. Deviation	,97058178
Most Extreme Differences	Absolute	,110
	Positive	,110
	Negative	-,067
Test Statistic		,110
Asymp. Sig. (2-tailed)		,340[c]

Table 3 the analysis yielded an Asymp. Sig. (2-tailed) value of 0.340, surpassing the established significance level of 0.05. Therefore, the null hypothesis (H0) could not be rejected, and the alternative hypothesis (Ha) was rejected. This outcome provides evidence supporting the assumption of normality for the standardized residual values.

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Table 4. Summary of Multicollinearity Test Results

Model		*Collinearity Statistics*	
		Tolerance	*VIF*
1	(*Constant*)		
	CAR	,479	2,086
	Cash_Ratio	,527	1,898
	LDR	,788	1,268
	OER	,905	1,105

Table 4 the multicollinearity diagnostics revealed that all independent variables (CAR, Cash Ratio, LDR, and OER) exhibited acceptable levels of tolerance, all exceeding the threshold of 0.10. Furthermore, the Variance Inflation Factors (VIF) for all predictors were below 10, indicating low levels of multicollinearity among them. These findings suggest that multicollinearity does not pose a significant concern in this regression model, thus validating its suitability for further analysis.

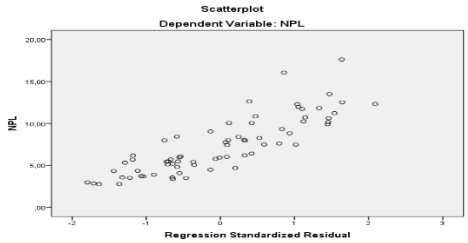

Figure 2. Scatterplot graph

Figure 2 the scatterplot of residuals exhibits a random pattern, with data points evenly dispersed above and below the zero line. This finding suggests the absence of heteroscedasticity, confirming the validity and suitability of the regression model for further analysis.

Table 5. Presents The Results Of The Autocorrelation Test

Model	*Durbin-Watson*
1	1,761

Table 5 The autocorrelation test yielded a Durbin-Watson value of 1.761. This value is compared with the Durbin-Watson table value using the significance level (α = 5%), the number of independent variables (k = 4) and the number of sample data (n = 70). The values obtained are dl = 1.494 and du = 1.735. Since the DW value is 1.761, the 4-dl value is calculated as 4 - 1.494 = 2.506, and the 4-du value is 4 - 1.735 = 2.265, These findings suggest the absence of autocorrelation, confirming the validity and suitability of the regression model for further analysis.

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Table 6. Summary of Multiple Linear Regression Model Results

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(*Constant*)	-15,023	4,984	-3,014	,004
	CAR	,039	,020	1,907	,061
	Cash_Ratio	,052	,034	1,542	,128
	LDR	,059	,023	2,502	,015
	OER	,172	,046	3,701	,000

Y = -15,023 + 0,039 CAR – 0,052 *Cash Ratio* + 0,059 LDR + 0,172 OER + e

Table 6 the model predicts that when all other factors are held constant, the average non-performing loan (NPL) ratio for rural banks (BPRs) would be -15.023%. Furthermore, the model indicates a positive relationship between several financial ratios and NPL. Specifically, a one percentage point increase in the Capital Adequacy Ratio (CAR) is associated with a 0.039 percentage point increase in NPL. Similarly, a one percentage point rise in the Cash Ratio corresponds to a 0.052 percentage point increase in NPL. The Loan-to-Deposit Ratio (LDR) also shows a positive relationship, with a one percentage point increase in LDR predicting a 0.059 percentage point increase in NPL. Finally, a one percentage point increase in the Operating Expense Ratio (OER) is associated with a more substantial 0.172 percentage point increase in the NPL of BPRs.

Table 7. Summary of Results of the Average Difference Test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-15,023	4,984		-3,014	,004
	CAR	,039	,020	,289	1,907	,061
	Cash Ratio	,052	,034	,223	1,542	,128
	LDR	,059	,023	,296	2,502	,015
	OER	,172	,046	,408	3,701	,000

Table 7 the Capital Adequacy Ratio (CAR) was examined using a t-test, resulting in a t-statistic of 1.907. Because this value is less than the critical value of 1.994 (at a 0.05 significance level), and the associated p-value of 0.061 is greater than 0.05, we fail to reject the null hypothesis. This indicates that the effect of CAR on NPL is not statistically significant. A similar analysis was conducted for the Cash Ratio. The calculated t-statistic of 1.542 was also lower than the critical value of 1.994, and the corresponding p-value of 0.128 was greater than 0.05. Therefore, we again fail to reject the null hypothesis, suggesting that the Cash Ratio's influence on NPL is also not statistically significant.

The Loan-to-Deposit Ratio (LDR) demonstrated a statistically significant positive relationship with NPL. The t-statistic of 2.502, exceeding the critical value of 1.994 (at a 0.05 significance level), and the associated p-value of 0.015, being

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less than 0.05, led to the rejection of the null hypothesis. Similarly, the Operating Expense Ratio (OER) also showed a statistically significant positive impact on NPL. With a calculated t-value of 3.701, surpassing the critical value of 1.994, and a p-value of 0.000 (less than 0.05), the null hypothesis was rejected, supporting the alternative hypothesis of a positive relationship between OER and NPL.

Table 8. F Test Results

Model		*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
1	Regression	223,258	4	55,814	6,484	,000[a]
	Residual	559,487	65	8,607		
	Residual	782,745	71			

Table 8 according to Table 7, the F-count value is 6.484 with a p-value of 0.00, which is less than 0.05, and the F-count value is greater than the F-table value (6.484 > 2.512). The null hypothesis was rejected in favor of the alternative hypothesis, indicating that CAR, Cash Ratio, LDR, and OER collectively have a statistically significant positive impact on NPL.

Table 9. Results of the Determination Coefficient Test

Model	*R*	*R Square*	*Adjusted R Square*	*Std. Error of the Estimate*
1	,534[a]	,285	,241	2,93385

Table 9 the coefficient of determination (R-squared), adjusted to 0.241, reveals that the independent variables CAR, Cash Ratio, LDR, and OER explain about 24.1% of the variation observed in NPL. This finding points to a moderately strong association between these variables and NPL. However, a substantial portion of NPL's variability (approximately 75.9%) is not accounted for by this model, implying that other factors not included in the study are likely at play.

Effect of CAR on NPL

The t-test results revealed a calculated t-value of 1.907, which is lower than the critical t-value of 1.994. Because the p-value (0.061) is higher than the 0.05 significance level, the null hypothesis is accepted, and the alternative hypothesis is rejected. This indicates that CAR does not have a statistically significant impact on NPL. This finding is inconsistent with Endri et al., (2022) study, which shows that CAR does have an effect on NPL. The determinants of NPLs in the context of CAR and cash ratio can be inferred from several abstracts. One study found that bank size, performance, and solvency are associated with NPLs (Al-Sharkas and Al-Sharkas 2022).

Another study highlighted that lower economic growth, higher inflation, and higher interest rates are linked to higher NPLs, while bank-specific variables such as bank size and performance also affect credit risk. Prior research, such as that by Jalali et al., (2023) and Asyadiah, N., & Hasanuh, N., (2023) has demonstrated the

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influence of macroeconomic factors like GDP growth, unemployment, and inflation on NPLs.

Prior research, such as that conducted by Mollah et al., (2022), has explored the relationship between capital adequacy ratios and bank profitability. Their findings suggest that the capital adequacy ratio can negatively impact bank profitability, and that different measures of capital adequacy, such as core capital and total capital to risk-weighted assets, may have varying effects.

Another study indicated that the liquidity ratio and capital adequacy ratio significantly affect NPLs, suggesting that maintaining the minimum level of CAR is crucial for financial stability (Msomi, 2022). Furthermore, a study on Turkish banks revealed that participation banks are more sensitive to sudden changes in exchange rates and increased NPLs, emphasizing the importance of capital adequacy in mitigating NPL risk (Kabir Hassan, Unsal, and Emre Tamer 2016)

The potential limitations of using CAR and cash ratio as indicators of NPLs can be inferred from the abstracts. One study found that the allowance for credit losses did not significantly affect the bank's CAR, suggesting limitations in using this measure to assess credit risk (Nugroho, Arif, and Halik 2021). Because banks will have less capital to absorb losses if CAR is low, they will be more exposed to credit risk, which could lead to an increase in non-performing loans. Additionally, by issuing loans without giving risk considerations enough consideration, banks may become more risk-taking and raise the possibility of credit defaults. According to signaling theory, a low CAR level indicates that a bank has inadequate capital, which may result in losses.

The Capital Adequacy Ratio (CAR) reflects a bank's capacity to absorb potential losses, including those stemming from non-performing loans (NPLs), by maintaining adequate capital reserves.

Hypothesis 1: states that there is no relationship between capital adequacy ratio (CAR) and non-performing loans (NPL).

Effect of Cash Ratio on NPL

A t-test yielded a calculated t-value of 1.907, which was less than the critical value of 1.994. Moreover, the p-value (0.061) was greater than the 0.05 significance level. Therefore, the null hypothesis is supported, suggesting that the Cash Ratio does not have a significant effect on NPLs. Furthermore, the study by (Jabbouri & Naili 2019) Jemphasizes the significant impact of macroeconomic factors like GDP growth, unemployment, and inflation on NPLs. This highlights the limitations of relying solely on CAR and Cash Ratio as predictors of credit risk. The implications of the relationship between CAR, cash ratio, and NPLs for regulatory policies and risk management in the banking sector can be inferred from the abstracts. The findings suggest that regulatory authorities should consider factors such as economic growth, inflation, and interest rates when formulating guidelines for risk mitigation and capital adequacy requirements (Jalali et al. 2023) and (Abbas et al. 2021).

Additionally, the negative impact of NPLs on bank profitability emphasizes the need for continuous evaluation of credit efficiency and loan granting procedures by bank management and regulators (Alrowaiei, Oudat, and Ali 2021) and (Pervez

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et al. 2023). This does not support Khairani F, dkk (2020) research which shows that the Cash Ratio has no effect on NPL. In general, the cash ratio's lack of impact on non-performing loans (NPLs) stems from the distinction between credit risk and liquidity. While the NPL gauges how well credit risk management handles loan defaults, the cash ratio assesses a bank's liquidity, or its capacity to satisfy short-term obligations. Hence, non-performing loans, which are impacted by credit regulations and the borrower's unique situation, cannot be stopped by a bank's cash reserves. This is due to the large size of the bank which is indicated by its large total asset ownership. This indicates that the process of using current assets has bad credit.

Hypothesis 2: there is no relationship between cash ratio and non-performing loans (NPL).

The Effect of LDR on NPL

The t-test results for the LDR variable indicate that the t-value (2.502) > t-table (1.994) with p-value (0.015) < (0.05). Therefore, H_0 is rejected and H_a is accepted. It can be concluded that LDR has a positive impact on NPL. The LDR can significantly influence NPLs. A high Loan-to-Deposit Ratio (LDR) suggests a bank is lending out a larger proportion of its deposits, potentially raising the risk of loan defaults if risk management practices are inadequate. Studies have shown that LDR has a significant impact on NPLs, suggesting that banks with higher LDRs may experience higher levels of NPLs due to increased lending risks (Jalali et al., 2023) and (Prasanth et al., 2020).

While LDR is crucial for understanding a bank's lending behavior, its direct impact on NPLs can vary. For instance, in some studies, LDR did not show a significant direct effect on NPLs but was crucial in understanding overall bank performance and risk management (Karadima M., & Louri, 2021) and (Suryani, & Africa, 2021). The findings of this study are consistent with the research by (Chun 2024), which stated that LDR has a positive effect on NPL. According to agency theory, banks are urged to seek high short-term profitability as agents, which may result in riskier lending choices. Even though this raises the default risk, banks may be more active in extending credit to enhance NIM if management incentives are not in line with shareholder objectives (such as avoiding NPLs). This is due to the bank's ability to manage disbursed credit, enabling it to perform an intermediation function. As the amount of disbursed credit increases, NPL tends to rise, and conversely, when disbursed credit decreases, NPL tends to lower.

Hypothesis 3: states that LDR has a positive effect on NPL.

The Effect of OER on NPL

Based on the t-test, the OER variable has a statistically significant relationship. The t-value of 3.701 exceeds the critical t-value of 1.994 at a significance level of 0.05. In addition, the p-value of 0.000 is smaller than the alpha level, indicating a strong relationship between the OER variable and the attachment variable. Therefore, H0 is rejected and Ha is accepted, so it is concluded that OER has a positive effect on NPL. OER, which measures a bank's efficiency in managing its operations, has a significant impact on NPLs. Higher operational efficiency

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typically leads to better loan monitoring and management, reducing the likelihood of loans becoming non-performing. Studies have consistently shown that lower OER (indicating higher efficiency) is associated with lower NPLs (Syed 2020) and (Nurwulandari et al. 2022).

Efficient operations help banks manage their resources better, leading to improved financial stability and lower NPL ratios. This relationship underscores the importance of operational efficiency in maintaining a healthy loan portfolio (Subaktiar et al., 2024) and (Asyadiah., N & Hasanuh., N 2023). Both LDR and OER are interconnected in their effects on NPLs. Efficient banks (low OER) with balanced LDRs tend to have lower NPLs, as they can manage their lending practices and operational costs more effectively. Conversely, banks with high LDRs and poor operational efficiency are more likely to see higher NPLs due to increased risk exposure and poor loan management (Jalali et al. 2023) and (Prasanth et al. 2020).

This aligns with the research conducted (Suryani, & Africa, 2021) and (Subaktiar et al., 2024) which asserts that OER has a positive impact on NPL. A higher OER ratio tends to result in an increase in the company's NPL, whereas a lower OER ratio reflects lower operational efficiency in the bank, leading to a reduction in NPL. This is because the efficiency of bank operational activities will enable a bank to obtain optimal profits, improve service to customers and the health of the bank will increase so that the possibility of NPLs will be smaller. According to agency theory, banks are urged to seek high short-term profitability as agents, which may result in riskier lending choices. Even though this raises the default risk, banks may be more active in extending credit to enhance NIM if management incentives are not in line with shareholder objectives (such as avoiding NPLs). The findings suggest that banks should focus on improving operational efficiency and maintaining a balanced LDR to minimize NPLs. Regulatory bodies might consider these factors when assessing the health and stability of banks (Jalali et al. 2023) and (Nurwulandari et al. 2022).

Hypothesis 4: OER positively influences NPL.

5. CONCLUSION AND SUGGESTIONS

In conclusion, the determinants of NPLs in the context of CAR and cash ratio, the impact of CAR and cash ratio on NPL risk, the potential limitations of using these ratios as indicators of NPLs, and the implications for regulatory policies and risk management in the banking sector can be inferred from the provided abstracts. However, it is important to note that while these abstracts provide valuable insights, a comprehensive understanding of the topic may require additional research beyond the scope of the provided abstracts.

More targeted research is needed to conclusively determine the impact of the cash ratio on NPLs. The impact of CAR on NPLs may vary by region and bank size, suggesting the need for context-specific analysis.

High LDR can increase NPLs if not managed properly, indicating the need for balanced lending practices. Lower OER (higher efficiency) is associated with lower NPLs, highlighting the importance of operational efficiency. Both LDR and

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OER significantly influence NPLs, and their combined management is crucial for reducing loan defaults and ensuring bank stability. By focusing on these key areas, banks can better manage their loan portfolios and reduce the incidence of non-performing loans, thereby improving overall financial stability and performance.

Both LDR and OER significantly affect NPLs, with elevated NPLs adversely impacting banking efficiency and profitability. To mitigate the effects of NPLs, financial institutions can focus on validating costs, conducting thorough loan reviews, and considering factors such as economic growth, inflation, and interest rates.

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