

## The Impact of Credit Risk, Liquidity Risk, and Operational Risk on Profitability of Government-Owned *BPRs* in West Java and Banten During the 2019–2023 Period

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### ABSTRACT

This study aims to analyze the effect of credit risk (Non Performing Loan / NPL), liquidity risk (Loan to Deposit Ratio / LDR), and operational risk (Operating Costs to Operating Income/BOPO) on profitability (Return on Assets / ROA) at People's Credit Banks (BPR) owned by the Regional Governments of West Java and Banten Provinces for the 2019–2023 period. The research method used is quantitative with a descriptive and verifiable approach, using secondary data in the form of BPR's annual financial statements. The data analysis technique used is panel data regression. The results of the study show that simultaneously credit risk, liquidity risk, and operational risk have a significant effect on the profitability of BPR. Partially, credit risk (NPL) and liquidity risk (LDR) have no significant effect on ROA, while operational risk (BOPO) has a negative and significant effect on ROA. These findings indicate that operational efficiency is the dominant factor in increasing the profitability of BPRs owned by local governments. Therefore, BPRs need to strengthen operational cost control, improve the quality of risk management, and maintain liquidity balance to achieve healthy and sustainable financial performance.

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**KEYWORDS** Credit Risk, Liquidity Risk, Operational Risk, Profitability, BPR



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### INTRODUCTION

Financial institutions have an important role in a country's economy. In general, financial institutions are institutions engaged in the financial sector, whose activities include collecting funds from the public and redistributing them in the form of financing and other financial services.

In Indonesia, financial institutions are divided into bank financial institutions and non-bank financial institutions. Based on Law Number 10 of 1998, from Commercial Banks and People's Credit Banks (BPR), which can operate conventionally and sharia. Banks are business entities that collect funds from the public in the form of deposits, then redistribute them in the form of credit or other forms with the aim of improving the standard of living of many people. Banks also play a role in supporting national development through equity, economic growth, and financial stability.

As an intermediary institution, banks and non-bank financial institutions function to collect and distribute public funds effectively and efficiently. This role makes banks a vital infrastructure in supporting the smooth running of the economy (Sumarni, 2021). Through the intermediation function, people's savings can be diverted into productive investments so that they benefit both the financial system and economic growth.

However, the success of banks in carrying out their intermediation function is highly dependent on their ability to maintain financial performance. Banks' failure to maintain

company performance and value can lower public trust, which ultimately reduces third-party funds under management and weakens the bank's profitability (Putri Wiyana et al., 2024)

Banks profit mainly from the difference in interest received from loans and interest paid on deposits. Therefore, banks need to optimize public deposits in order to increase credit disbursement capacity and increase profitability.

From the explanation above, it can be concluded that financial institutions, especially banks, have a vital role in the economy through the intermediation function, namely collecting public funds in the form of current accounts, savings and other deposits, then redistributing them to people in need in the form of credit or productive investment. The success of a bank in carrying out this function is largely determined by its financial performance. If performance declines, public confidence will also decrease, which will have an impact on the decline of third-party funds as well as the bank's profitability. Therefore, banks need to optimize fund collection and credit distribution effectively in order to increase profits and maintain financial stability (Ghofirin & Susesti, 2023; Juliantara & Darmayanti, 2022).

With a large role as a financial institution that controls and manages public funds, it causes banks as one of the financial industries that are strictly supervised and regulated by the government (Wayan Pebry Diyan Gayatri et al., 2019). In this case, supervision and regulation are carried out by the *OJK*, which is an independent institution that has the function of regulation, supervision, examination, and investigation as regulated in Law Number 21 of 2011.

Based on Law Number 4 of 2023, the People's Credit Bank (BPR) has changed to the People's Economic Bank with the expansion of business activities that increase operational complexity and risks. This condition requires the implementation of Good Corporate Governance (GCG) and effective risk management so that the performance of BPRs remains healthy and sustainable. The Financial Services Authority (*OJK*) requires BPRs to apply the principles of transparency, accountability, responsibility, independence, and fairness, as well as adjust the implementation of risk management to their core capital.

Although the number of BPRs in Indonesia has experienced a downward trend due to consolidation and revocation of business licenses, the BPR industry's performance in 2023 still shows relatively good conditions, with positive growth in loans and third-party funds and strong capital ratios. In West Java and Banten, there are 15 BPRs owned by the Regional Government which play an important role in supporting MSME financing and the regional economy (Saputera, 2021; Melastiani & Sudirman, 2022). However, the sustainability of BPR's business is highly dependent on the ability to maintain financial health through effective management of credit, liquidity, and operational risk.

Profitability measured by Return on Assets (ROA) is the main indicator of BPR's success in managing assets productively. During the 2019–2023 period, BPR profitability in West Java and Banten showed significant fluctuations, especially due to increased credit risk, liquidity pressure, and operational inefficiencies during the pandemic. Previous research findings show that credit risk and operational risk tend to have a negative impact on profitability, while liquidity risk shows mixed results, thus encouraging further research on the influence of these three risks on the profitability of local government BPRs in West Java and Banten (Fadriyaturrohman & Suria Manda, 2022; Stiawati & Hadi Kusuma, 2021; Zidni, 2023).

Therefore, the novelty of this research lies in its specific focus on government-owned BPRs in West Java and Banten during a turbulent period (2019-2023) that includes the COVID-19 pandemic. This study aims to fill the gap by providing empirical evidence on how credit, liquidity, and operational risks simultaneously and partially impact the profitability of these regionally strategic financial institutions. The primary objective is not only to confirm theoretical relationships but also to offer practical, evidence-based recommendations for BPR management and local government policymakers to strengthen risk management frameworks and enhance financial sustainability. The benefits of this research are twofold: academically, it contributes to the literature on banking risk and profitability in a specific institutional and geographical context; practically, it provides actionable insights for BPR managers to prioritize risk management efforts and for regulators to formulate more targeted supervisory policies for government-owned BPRs.

## **METHOD**

### **1. Types of Research**

This study used a verifiable descriptive method with a quantitative approach. The descriptive method is used to describe the condition of credit risk, liquidity risk, operational risk, and the level of profitability of BPRs owned by Regional Governments in West Java and Banten during the 2019–2023 period. Meanwhile, the verifiable method is used to test the validity of hypotheses regarding the influence of credit risk, liquidity risk, and operational risk on profitability through empirical data analysis.

### **2. Population and Sample**

The population in this study is all conventional BPRs owned by the Regional Government in West Java and Banten Provinces which amount to 15 BPRs. The research sample was determined by purposive sampling technique based on certain criteria, such as the availability of complete financial statements, operational sustainability during the research period, and the completeness of the research variable data. Based on these criteria, as many as 11 BPRs were obtained as research samples with an observation period of 2019–2023.

### **3. Data Collection Techniques**

The data collection technique used in this study is a documentation study, which is by collecting, recording, and reviewing the annual financial statements of BPR which are the object of research. The data used are secondary data obtained from financial statements published by banks as well as supporting data from the Financial Services Authority (*OJK*) and Bank Indonesia, which are then analyzed according to the needs of the research.

### **4. Data Analysis Techniques**

The data analysis techniques used include descriptive analysis and multiple linear regression analysis with panel data. Descriptive analysis was used to describe the characteristics of each research variable, while panel data regression was used to test the influence of credit risk (NPL), liquidity risk (LDR), and operational risk (BOPO) on profitability (ROA). The test is carried out through the classical assumption test, the F test, the t test, and the determination coefficient ( $R^2$ ) with the help of the EViews software version 12.

## RESULT AND DISCUSSION

### Credit Risk Conditions, Liquidity Risks, and Operational Risks of BPRs owned by the Regional Governments of West Java and Banten Provinces in the period 2019-2023?

#### 1. Condition of BPR NPL owned by the Regional Government of West Java and Banten Province 2019-2023

Based on the 2019–2023 financial statement data, the condition of BPR NPLs owned by the Regional Governments of West Java and Banten Provinces shows fluctuations with a tendency to increase at the end of the period. This can be seen in the following table:

**Table 1 NPL Ratio of BPR West Java Banten for the 2019-2023 Period**

No	BPR's Name	2019	2020	2021	2022	2023
1	BPR Cianjur West Java	2.63	6.17	4.00	3.25	3.14
2	BPR Cipatujah West Java	3.79	5.93	6.22	6.16	5.92
3	BPR Cirebon West Java	4.30	5.39	4.61	4.36	6.45
4	BPR Galuh Mandiri West Java	19.54	8.54	7.87	5.54	6.66
5	BPR Karawang West Java	14.24	13.79	8.30	9.65	16.33
6	BPR Wibawa Mukti West Java	13.30	11.95	1.86	5.95	2.89
7	BPR Karya Utama West Java	7.53	7.94	6.36	10.38	22.32
8	BPR Lebak Sejahtera Banten	4.06	4.46	0.77	1.34	2.38
9	BPR Berkah Pandeglang Banten	1.44	0.90	0.72	0.75	2.95
10	BPR Serang Banten	3.83	3.86	4.03	7.20	9.70
11	BPR Kerta Raharja Gemilang Banten	0.66	1.72	1.72	1.80	2.15
	Minimum Score:	0.66	0.90	0.72	0.75	2.15
	Maximums Score:	19.54	13.79	8.30	10.38	22.32
	Average Score/Year:	6.85	6.42	4.22	5.13	7.35
	Average Score for 5 Years:			5.99		

Source: OJK Website (Processed Data)

From the table above, it is reflected that the average NPL was recorded at 6.85% in 2019 and decreased slightly in 2020 to 6.42%, then experienced a significant decline in 2021 to 4.22%, before increasing again in 2022 by 5.13% and reaching 7.35% in 2023, with a five-year average of 5.99%. The minimum NPL value was relatively low in the 2019–2022 period, but increased in 2023 to 2.15%, while the maximum value fluctuated and reached the highest peak in 2023 of 22.32%. This condition indicates that although on average the NPL of the Regional Government BPR is still at a moderate level, there is a considerable difference in performance between the BPRs, especially in 2023, which reflects an increase in credit risk in some of the Regional Government-owned BPRs in the West Java and Banten regions.

#### 2. The condition of the BPR LDR owned by the West Java and Banten Regional Governments for the 2019-2023 period

Based on BPR financial statement data, the Loan to Deposit (LDR) Ratio shows that BPR's liquidity conditions are experiencing fluctuating developments, but tend to be within limits that can still be controlled. This is reflected in the following table:

**Table 2 LDR Ratio of BPR West Java Banten for the 2019-2023 Period**

No	Nama BPR	2019	2020	2021	2022	2023
1	BPR Cianjur West Java	79.98	78.38	77.19	83.46	120.91
2	BPR Cipatujah West Java	82.53	76.32	89.65	84.84	96.18

3	BPR Cirebon West Java	66.79	57.78	57.70	64.88	64.88
4	BPR Galuh Mandiri West Java	88.07	84.30	82.04	90.67	83.86
5	BPR Karawang West Java	80.53	70.53	38.95	83.63	79.78
6	BPR Wibawa Mukti West Java	96.35	91.79	93.65	81.18	95.22
7	BPR Karya Utama West Java	84.41	85.08	76.29	80.83	67.75
8	BPR Lebak Sejahtera Banten	82.08	89.15	36.89	86.52	81.03
9	BPR Berkah Pandeglang Banten	92.71	90.69	90.29	88.97	84.98
10	BPR Serang Banten	85.15	84.54	77.12	78.24	92.90
11	BPR Kerta Raharja Gemilang Banten	88.51	88.12	82.70	86.12	86.47
Minimum Score:		66.52	66.79	57.78	57.70	64.88
Maximums Score:		96.35	91.79	93.65	90.67	120.91
Average Score/Year:		84.26	82.42	82.05	82.01	86.72
Average Score for 5 Years:		83.49				

Source: OJK Website (Processed Data)

Based on the table above, the average Loan to Deposit Ratio (LDR) shows a downward trend during the period 2019 to 2022. In 2019, the average LDR was recorded at 84.26%, then decreased in 2020 to 82.42%. The decline continued in 2021 with an average LDR of 82.05% and decreased again in 2022 to 82.01%. However, in 2023 the average LDR has increased significantly by 4.71%, reaching 86.72%. Overall, the average LDR for five years of observation was recorded at 83.49%.

The minimum value of the LDR ratio occurred in 2022 of 57.70%, which reflects the low disbursement of credit compared to the third-party funds that were successfully raised. This condition shows the prudent attitude of bank management in distributing credit. Meanwhile, the maximum value of the LDR ratio was recorded in 2023 at 120.91%, which indicates that in certain periods banks disbursed credit in excess of available third-party funds. This condition reflects the intermediation function which tends to be aggressive and has the potential to pose liquidity risks if not balanced with adequate funding management and risk control.

### 3. Condition of BOPO BPR owned by the West Java and Banten Regional Governments for the 2019-2023 period

From the results of the analysis of the BPR financial statement ratio, the average ratio of Operating Costs to Operating Income (BOPO) of BPR West Java and Banten during the period 2019-2022 tends to experience a decline and in 2023 will experience a fairly sharp increase, this can be seen in the following table:

**Table 3 BOPO Ratio of BPR West Java Banten for the 2019-2023 Period**

No	Nama BPR	2019	2020	2021	2022	2023
1	BPR Cianjur West Java	90.67	97.26	99.96	96.92	97.02
2	BPR Cipatujah West Java	74.97	83.05	81.43	84.17	84.14
3	BPR Cirebon West Java	83.43	85.34	85.80	86.58	85.80
4	BPR Galuh Mandiri West Java	97.84	93.15	73.16	79.62	86.47
5	BPR Karawang West Java	95.91	86.60	85.71	87.12	96.51
6	BPR Wibawa Mukti West Java	105.37	88.54	86.06	74.27	94.77
7	BPR Karya Utama West Java	91.82	95.24	93.95	92.37	95.89
8	BPR Lebak Sejahtera Banten	63.57	71.01	67.35	64.80	73.34
9	BPR Berkah Pandeglang Banten	77.47	77.22	77.93	79.40	88.04
10	BPR Serang Banten	85.15	85.54	84.94	79.57	87.87
11	BPR Kerta Raharja Gemilang Banten	81.44	87.43	89.73	86.65	93.36
Minimum Score:		63.57	71.01	67.35	64.80	73.34
Maximums Score:		105.37	97.26	99.96	96.92	97.02

Average Score/Year:	86.26	95.49	84.64	82.86	89.38
Average Score for 5 Years:	85.73				

Source: *OJK* Website (Processed Data)

Based on Table 3, the BOPO ratio shows a downward trend from 2019 to 2022. In 2019, the BOPO ratio was recorded at 86.26%, then decreased to 85.49% in 2020 and decreased again in 2021 to 84.64%. The decline continued in 2022 with a BOPO ratio of 82.86%. However, in 2023 there will be a significant increase in the BOPO ratio of 6.52%, so that the BOPO ratio at the end of 2023 will close at 89.38%. The lowest BOPO ratio value was recorded in 2019 at 63.57%, while the highest value also occurred in the same year, which was 105.37%.

#### A. The condition of the BPR ROA owned by the West Java and Banten Regional Governments for the 2019-2023 period

From BPR financial statement data, it shows that the average Return on Assets (ROA) ratio of BPR West Java and Banten in 2019-2022 is quite stable, but in 2023 it has experienced a fairly sharp decline, this is presented in the following table:

**Table 4 West Java Banten ROA Ratio for the 2019-2023 Period**

No	Nama BPR	2019	2020	2021	2022	2023
1	BPR Cianjur West Java	2.46	0.83	0.25	1.17	0.82
2	BPR Cipatuh West Java	5.82	3.28	3.46	2.83	2.79
3	BPR Cirebon West Java	2.77	2.91	2.44	2.13	2.31
4	BPR Galuh Mandiri West Java	0.27	3.03	3.94	3.22	1.76
5	BPR Karawang West Java	0.40	1.54	1.98	1.11	0.48
6	BPR Wibawa Mukti West Java	0.00	2.60	4.23	4.21	1.96
7	BPR Karya Utama West Java	1.79	1.00	1.14	1.53	0.78
8	BPR Lebak Sejahtera Banten	10.14	8.08	8.82	13.72	7.02
9	BPR Berkah Pandeglang Banten	5.22	5.15	4.95	4.24	2.18
10	BPR Serang Banten	3.79	2.77	2.88	2.80	2.19
11	BPR Kerta Raharja Gemilang Banten	3.38	2.07	1.90	2.22	1.00
Minimum Score:		0.00	0.83	0.25	1.11	0.48
Maximums Score:		10.14	8.08	8.82	13.72	7.02
Average Score/Year:		3.28	3.02	3.27	3.56	2.12
Average Score for 5 Years:		3.05				

Source: *OJK* Website (Processed Data)

Based on Table 4.4, the average Return on Assets (ROA) ratio in BPRs owned by Regional Governments in West Java and Banten shows fluctuations during the observation period. In 2019, the average ROA was recorded at 3.28%, then decreased in 2020 to 3.02%. Furthermore, in 2021 ROA increased by 0.25% to reach 3.27%, and increased again in 2022 by 0.29% to 3.56%. However, in 2023 ROA experienced a significant decrease of 1.44%, so that at the end of 2023 the ROA ratio was recorded at 2.12%. Overall, the average ROA ratio over the past five years has been at 3.05%.

**B. The effect of credit risk, liquidity risk, and operational risk simultaneously and partially on the profitability of BPRs owned by the Governments of West Java and Banten for the 2019-2023 period?**

Verifiable testing in this study uses a panel data regression test in the study because the data used in this study are time series data and cross section data

In the panel data regression there are 3 models, namely Common Effect Model (CEM), Fixed Effect Model (FEM) and Random Effect Model (REM)

1) Common Effect Model (CEM) Test Results

**Tabel 5 Common Effect Model**

Dependent Variable: ROA				
Method: Panel Least Squares				
Date: 12/17/25 Time: 11:53				
Sample: 2019 2023				
Periods included: 5				
Cross-sections included: 11				
Total panel (balanced) observations: 55				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.88957	1.951929	11.72664	0.0000
NPL	-0.009690	0.037952	-0.255319	0.7995
LDR	0.024008	0.015491	1.549882	0.1274
BOPO	-0.254135	0.019602	-12.96474	0.0000
Root MSE	1.085691	R-squared		0.817367
Mean dependent var	3.050182	Adjusted R-squared		0.806624
S.D. dependent var	2.563902	S.E. of regression		1.127464
Akaike info criterion	3.147765	Sum squared resid		64.82989
Schwarz criterion	3.293753	Log likelihood		-82.56354
Hannan-Quinn criter.	3.204220	F-statistic		76.08298
Durbin-Watson stat	1.376965	Prob(F-statistic)		0.000000

Source: processed researcher, 2025

Based on the table above, it can be seen that the Probability value t calculates the variables of Credit Risk (NPL), Liquidity Risk (LDR) and Operational Risk (BOPO), respectively 0.7995, 0.1274 and 0.0000, while the Prob. f calculation is 0.000000 and the adjusted r square value is 0.806624.

2) Fixed Effect Model (FEM) Test Results

**Tabel 6 Fixed Effect Model**

Dependent Variable: ROA				
Method: Panel Least Squares				
Date: 12/17/25 Time: 11:53				
Sample: 2019 2023				
Periods included: 5				
Cross-sections included: 11				
Total panel (balanced) observations: 55				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.67544	2.187165	8.081438	0.0000
NPL	-0.018745	0.041526	-0.451410	0.6541
LDR	0.007629	0.016259	0.469243	0.6414
BOPO	-0.176726	0.025340	-6.974126	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
Root MSE	0.676552	R-squared		0.929080

Mean dependent var	3.050182	Adjusted R-squared	0.906593
S.D. dependent var	2.563902	S.E. of regression	0.783593
Akaike info criterion	2.565476	Sum squared resid	25.17473
Schwarz criterion	3.076433	Log likelihood	-56.55058
Hannan-Quinn criter.	2.763067	F-statistic	41.31669
Durbin-Watson stat	2.991742	Prob(F-statistic)	0.000000

Source: processed researcher, 2025

Based on the table above, it can be seen that the Probability value t calculates the variables of Credit Risk (NPL), Liquidity Risk (LDR) and Operational Risk (BOPO) are 0.6541, 0.6414 and 0.0000, respectively, while the Prob. f calculation is 0.000000 and the adjusted r square value is 0.906593.

### 3) Random Effect Model (REM) Test Results

**Tabel 7 Random Effect Model**

Dependent Variable: ROA				
Method: Panel EGLS (Cross-section random effects)				
Date: 12/17/25 Time: 11:53				
Sample: 2019 2023				
Periods included: 5				
Cross-sections included: 11				
Total panel (balanced) observations: 55				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.63911	1.966441	9.987134	0.0000
NPL	-0.010657	0.037472	-0.284388	0.7773
LDR	0.014521	0.014843	0.978299	0.3325
BOPO	-0.206910	0.021628	-9.566889	0.0000
<b>Effects Specification</b>				
		S.D.	Rho	
	Cross-section random	0.834243	0.5313	
	Idiosyncratic random	0.783593	0.4687	
<b>Weighted Statistics</b>				
Root MSE	0.780934	R-squared	0.703108	
Mean dependent var	1.181277	Adjusted R-squared	0.685643	
S.D. dependent var	1.446436	S.E. of regression	0.810981	
Sum squared resid	33.54217	F-statistic	40.25981	
Durbin-Watson stat	2.309474	Prob(F-statistic)	0.000000	
<b>Unweighted Statistics</b>				
R-squared	0.788999	Mean dependent var	3.050182	
Sum squared resid	74.89997	Durbin-Watson stat	1.034243	

Source: processed researcher, 2025

Based on the table above, it can be seen that the Probability value t calculates the variables of Credit Risk (NPL), Liquidity Risk (LDR) and Operational Risk (BOPO) are 0.7773, 0.3325 and 0.0000, respectively, while the value of Prob. f calculation is 0.000000 and the adjusted r square value is 0.685643.

### 1. Model Selection Test

In the panel data regression test to determine the model to be selected, whether it is a CEM or FEM or REM model, a model selection test consisting of the Chow Test, Hausman Test and Lagrange Multiplier (LM) Test must be carried out

- 1) The Chow test, is a statistical test used to determine the most appropriate panel data regression model between the Common Effect Model (CEM) and the Fixed Effect Model (FEM). Decision-making policy:
    - a) If the Probability value (Cross-section F)  $< 0.05$ , then the Fixed Effect Model (FEM) model  $\rightarrow$  more precise.
    - b) If the Probability value (Cross-section F)  $> 0.05$ , then the Common Effect Model (CEM) model  $\rightarrow$  more appropriate.
- Chow Test Results

**Table 8 Chow Test Results**

Redundant Fixed Effects Tests			
Equation: Untitled			
Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	6.458308	(10,41)	0.0000
Cross-section Chi-square	52.025933	10	0.0000

Source: Processed Researcher, 2025

Based on the table above, it can be seen that the Cross-section F Probability value is  $0.0000 < 0.05$ , so the Fixed Effect Model is better than the Common Effect Model or the chosen one is the Fixed Effect Model (Napitupulu et al., 2021). Then it was followed by a thirist test.

- 2) The Hausman test, is a statistical test used to determine the most appropriate panel data regression model between the Fixed Effect Model (FEM) and the Random Effect Model (REM). Decision-making policy:
    - a) If the Chi-Square Probability value  $< 0.05$ , then the Fixed Effect Model (FEM) model  $\rightarrow$  more appropriate.
    - b) If the Chi-Square Probability value  $> 0.05$ , then the Random Effect Model (REM) model  $\rightarrow$  more precise.
- Hausman Test Results

**Table 9 Hausman Test Results**

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.627363	3	0.0848

Source: Processed Researcher, 2025

Based on the table above, it can be seen that the Probability value is  $0.0848 > 0.05$ , so the Random Effect Model is better than the Fixed Effect Model or the chosen one is the Random Effect Model (Napitupulu et al., 2021). Then it is followed by the lagrange multiplier test.

- 3) Lagrange Multiplier (LM) test, a statistical test used to determine the selection of panel data regression models between Common Effect Model (CEM) and Random Effect Model (REM). Decision-making policy:
  - a. If the Breusch-Pagan Probability value  $< 0.05$ , then the Random Effect Model (REM) model  $\rightarrow$  more precise.

- b. If the value of Prob. Breusch-Pagan  $> 0.05$ , so the Common Effect Model (CEM) model  
→ more accurate.

Lagrange Multiplier Test Results

**Table 10 Lagrange Multiplier Test Results**

<b>Lagrange Multiplier Tests for Random Effects</b>			
<b>Null hypotheses: No effects</b>			
<b>Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives</b>			
	<b>Test Hypothesis</b>		
	Cross-section	Time	Both
Breusch-Pagan	14.84912 (0.0001)	1.295404 (0.2551)	16.14452 (0.0001)
Honda	3.853455 (0.0001)	-1.138158 (0.8725)	1.920005 (0.0274)
King-Wu	3.853455 (0.0001)	-1.138158 (0.8725)	1.097839 (0.1361)
Standardized Honda	4.936507 (0.0000)	-0.934922 (0.8251)	-0.639549 (0.7388)
Standardized King-Wu	4.936507 (0.0000)	-0.934922 (0.8251)	-1.383551 (0.9168)
Gourieroux, et al.	--	--	14.84912 (0.0002)

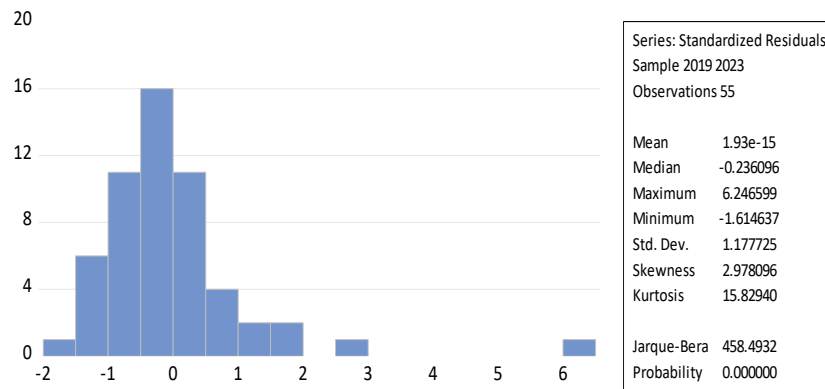
Source: Processed Researcher, 2025

Based on the table above, it can be seen that the Breusch-Pagan Probability value is  $0.0001 < 0.05$ , so the Random Effect Model is better than the Common Effect Model or the chosen one is the Random Effect Model (Napitupulu et al., 2021). So the best model is the Random Effect Model.

**2. Classical Assumption Test Results**

Based on the results of the Chow Test, Hausman Test, and Lagrange Multiplier Test, the most appropriate panel data regression model in this study is the Random Effect Model (REM). The REM model was estimated using the Generalized Least Square (GLS) method, so that it has theoretically taken into account the existence of heteroscedasticity and autocorrelation. However, in this study, classical assumption tests are still carried out which include normality tests, heteroscedasticity tests, autocorrelation tests, and multicollinearity tests as diagnostic tests to ensure the feasibility and consistency of the regression model used (Napitupulu et al., 2021).

### 1) Normality Test Results



**Figure 1 Normality Test Results**

Source: Processed Researcher, 2025

Based on the table above, it can be seen that the Probability value is  $0.000000 < 0.05$ , so it can be concluded that the data is not normally distributed (Napitupulu et al., 2021). However, referring to the Central Limit Theorem, if the sample count is more than 30 ( $N > 30$ ) then the data is assumed to be normally distributed (Al-Refiay et al., 2025) (Singh et al., 2025) (Nair, 2025) (Abd-Elhaleim et al., 2025) (Savitri et al., 2021). The number of data in this study is 55 ( $> 30$ ), so that the data meets the assumption of normality and can be concluded that the data is normally distributed.

### 2) Multicollinearity Test Results

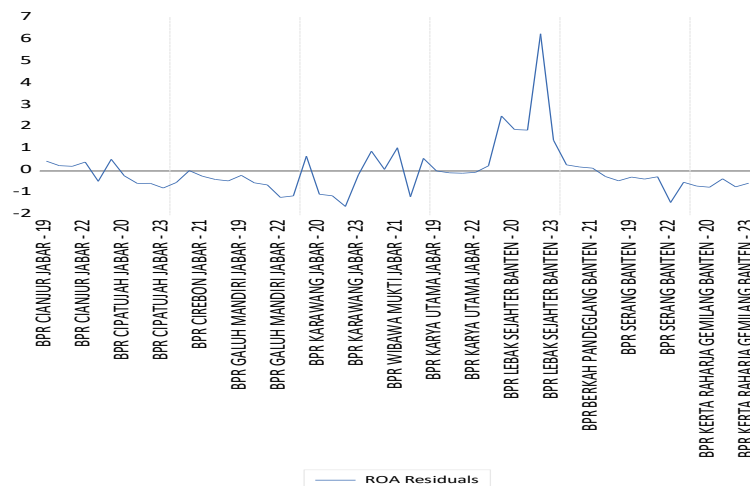
**Table 11 Multicollinearity Test Results**

Variable	Centered LIVE
NPL	1.365440
LDR	1.049451
BOPO	1.319683

Source: Processed Researcher, 2025

Based on the table above, it is known that all independent variables have a Centered Variance Inflation Factor (VIF) value of  $< 10.00$ . This shows that the research model does not contain symptoms of multicollinearity, so it can be concluded that the regression model has passed the multicollinearity test (Napitupulu et al., 2021).

### 3) Heteroscedasticity Test Results



**Figure 2 Heteroscedasticity Test Results**

Source: Processed Researcher, 2025

Based on the residual graph (residual heteroscedasticity test), it can be seen that the residual distribution is spread randomly and does not form a specific pattern. This condition shows that residual variance is constant. Thus, it can be concluded that the regression model did not experience symptoms of *heteroscedasity* or passed the *heteroscedasity* test (Napitupulu et al., 2021).

#### 4) Autocorrelation Test Results

**Table 12 Autocorrelation Test Results**

Root MSE	0.780934	R-squared	0.703108
Mean dependent var	1.181277	Adjusted R-squared	0.685643
S.D. dependent var	1.446436	S.E. of regression	0.810981
Sum squared resid	33.54217	F-statistic	40.25981
Durbin-Watson stat	2.309474	Prob(F-statistic)	0.000000

Source : processed Researcher, 2025

Based on the table above, it can be seen that the durbin watson value of 2.309474 is in the range of 1.5 to 2.5. This indicates that there is no autocorrelation in the regression equation, and it can be concluded that the regression model has passed the autocorrelation test (Saleh & Mansour, 2024) and (Alhawaj et al., 2023).

### 3. Panel Data Regression Equation

The regression equation of panel data in this study is formulated as follows:

$$ROA_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 LDR_{it} + \beta_3 BOPO_{it} + \varepsilon_{it}$$

Based on the results of the model selection test, the most suitable model is the Random Effect Model (REM). Therefore, the analysis of panel data was then carried out using the Random Effect Model, and the results of regression estimation are presented in the following table, which shows the influence of the variables Credit Risk (NPL), Liquidity Risk (LDR) and Operational Risk (BOPO) on Profitability:

**Tabel 13 Random Effect Model**

Dependent Variable: ROA				
Method: Panel EGLS (Cross-section random effects)				
Date: 12/17/25 Time: 11:53				
Sample: 2019 2023				
Periods included: 5				
Cross-sections included: 11				
Total panel (balanced) observations: 55				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.63911	1.966441	9.987134	0.0000
NPL	-0.010657	0.037472	-0.284388	0.7773
LDR	0.014521	0.014843	0.978299	0.3325
BOPO	-0.206910	0.021628	-9.566889	0.0000
Effects Specification				
			S.D.	Rho
	Cross-section random		0.834243	0.5313
	Idiosyncratic random		0.783593	0.4687
Weighted Statistics				
Root MSE	0.780934	R-squared		0.703108
Mean dependent var	1.181277	Adjusted R-squared		0.685643
S.D. dependent var	1.446436	S.E. of regression		0.810981
Sum squared resid	33.54217	F-statistic		40.25981
Durbin-Watson stat	2.309474	Prob(F-statistic)		0.000000
Unweighted Statistics				
R-squared	0.788999	Mean dependent var		3.050182
Sum squared resid	74.89997	Durbin-Watson stat		1.034243

Source: Processed Researcher, 2025

Based on the results of the panel data regression estimation using the Random Effect Model, the regression equation is obtained as follows:

$$ROA = 19.63911 - 0.010657 NPL + 0.014521 LDR - 0.206910 BOPO + e.$$

With the following explanation:

- 1) The constant value is 19.63911, indicating that if the variables Credit Risk (NPL), Liquidity Risk (LDR) and Operational Risk (BOPO) are constant or equal to 0, then the Profitability variable (ROA) is 19.63911%.
- 2) The beta coefficient of the variable Credit Risk (NPL) is -0.010657, indicating that if the variable Credit Risk (NPL) increases by 1%, then the variable Profitability (ROA) will decrease by 0.010657% assuming other variables have a constant value.
- 3) The beta coefficient of the Liquidity Risk variable (LDR) is 0.014521, indicating that each Liquidity Risk variable (LDR) will increase by 1%, then the Profitability variable (ROA) will increase by 0.014521% assuming other variables have a constant value.
- 4) The beta coefficient of the Operational Risk variable (BOPO) is -0.20691, indicating that each variable of Operational Risk (BOPO) has increased by 1%, then the Profitability variable (ROA) will decrease by 0.20691% assuming other variables have a constant value.

#### 4. Uji Hypothesis

The results of the hypothesis test in this study were obtained through simultaneous (F test) and partial test (t test) and by using the Random Effect Model (REM). This hypothesis test aims to determine the influence of the variables of Credit Risk (NPL), Liquidity Risk (LDR), and Operational Risk (BOPO) on Profitability (ROA) in BPRs owned by the Regional Governments of West Java and Banten Provinces for the 2019-2023 period.

### 1) Simultaneous Hypothesis Test (F Test)

Simultaneous hypothesis test (F test) was carried out to find out whether all independent variables, namely Credit Risk (NPL), Liquidity Risk (LDR), and Operational Risk (BOPO), together affect the dependent variable, namely Profitability (ROA). The basis for decision-making in the F test is to compare the F-statistical probability value with a significance level of 0.05:

- If the significance value of  $F < 0.05$ , then the independent variable simultaneously has a significant effect on the dependent variable.
- If the significance value of  $F > 0.05$ , then the independent variable simultaneously has no significant effect on the dependent variable.

The results of the F Test in this study are as follows:

**Table 14 F Test Results**

Root MSE	0.780934	R-squared	0.703108
Mean dependent var	1.181277	Adjusted R-squared	0.685643
S.D. dependent var	1.446436	S.E. of regression	0.810981
Sum squared resid	33.54217	F-statistic	40.25981
Durbin-Watson stat	2.309474	Prob(F-statistic)	0.000000

Source: Processed Researcher, 2025

Based on the results of the simultaneous test (F test), it is known that the F-statistical Probability value is 0.000000, which is smaller than the significance level of 0.05. This shows that the variables of Credit Risk (NPL), Liquidity Risk (LDR), and Operational Risk (BOPO) simultaneously have a significant effect on Profitability (ROA). Thus, the simultaneous hypothesis (H1) which states that NPL, LDR, and BOPO together affect ROA is accepted, while the null hypothesis is rejected.

### 2) Partial Hypothesis Test (t-test)

The partial hypothesis test (t-test) was carried out to determine the influence of each independent variable, namely Credit Risk (NPL), Liquidity Risk (LDR), and Operational Risk (BOPO), on the dependent variable, namely Profitability (ROA). The basis for decision-making in the t-test is to compare the value of the t-statistical probability with a significance level of 0.05:

- a) If the probability value of t-statistic  $< 0.05$ , then the independent variable partially has a significant effect on the dependent variable.
- b) If the probability value of t-statistic  $> 0.05$ , then the independent variable partially has no significant effect on the dependent variable.

The results of the t-test in this study are as follows:

**Table 15 Results of the t test**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.63911	1.966441	9.987134	0.0000
NPL	-0.010657	0.037472	-0.284388	0.7773
LDR	0.014521	0.014843	0.978299	0.3325
BOPO	-0.206910	0.021628	-9.566889	0.0000

Source: Processed Researcher, 2025

Based on the results of the partial test (t-test), the effect of independent variables on partially dependent variables is as follows:

- a. The probability value of t calculating the variable Credit Risk (NPL) is  $0.7773 > 0.05$ , then H2 is rejected, meaning that Credit Risk has a negative effect that is not significant on profitability.
- b. The probability value of t calculates the Liquidity Risk variable (LDR) is  $0.16625 > 0.05$ , then H3 is rejected, meaning that Liquidity Risk has a positive effect not significantly on Profitability.
- c. The probability value of t calculating the variable Operational Risk (BOPO) is  $0.0000 < 0.05$  and the value of the negative value coefficient is  $-0.20691$ , then H4 is accepted, meaning that Operational Risk has a significant negative effect on Profitability.

### 5. Coefficient of Determination Test (R<sup>2</sup>)

The determination coefficient (R<sup>2</sup>) test is used to measure the extent of the ability of independent variables to explain the variation of dependent variables. The R<sup>2</sup> value indicates the proportion of variation of dependent variables that can be explained by independent variables in the regression model, while the rest is explained by other variables outside the study model.

The basis for decision-making in the determination coefficient (R<sup>2</sup>) test is to look at the magnitude of the R<sup>2</sup> or Adjusted R<sup>2</sup> value. The value is in the range of 0 to 1.

- a. If the value of R<sup>2</sup> or Adjusted R<sup>2</sup> is closer to 1, then the greater the ability of the independent variable to explain the variation of the dependent variable.
- b. If the value of R<sup>2</sup> or Adjusted R<sup>2</sup> is close to 0, then the ability of the independent variable to explain the variation of the dependent variable is smaller.

The results of the Determination Coefficient (R<sup>2</sup>) test in the study, as shown in the following table:

**Table 16 Determination Coefficient Test Results (R<sup>2</sup>)**

Root MSE	0.780934	R-squared	0.703108
Mean dependent var	1.181277	Adjusted R-squared	0.685643
S.D. dependent var	1.446436	S.E. of regression	0.810981
Sum squared resid	33.54217	F-statistic	40.25981
Durbin-Watson stat	2.309474	Prob(F-statistic)	0.000000

Based on the Determination Coefficient Test (R<sup>2</sup>), it is known that the Adjusted R-Square value is 0.685643 or 68.5643%. The value of the determination coefficient showed that independent variables consisting of Credit Risk (NPL), Liquidity Risk (LDR) and Operational Risk (BOPO) were able to explain the Profitability variation (ROA) of 68.5643%, while the remaining 31.4357% (100 – adjusted R-Square value) was explained by other variables outside the model of this study that were not included in the analysis.

The discussion of the results of this study interprets the findings of descriptive and verifiable analysis related to credit risk (NPL), liquidity risk (LDR), and operational risk (BOPO) in BPRs owned by the Regional Governments of West Java and Banten Provinces for the 2019–2023 period. The discussion is associated with the provisions of banking regulations, the condition of the national BPR industry, as well as the findings of previous research as an empirical contribution to strengthening the management and performance of BPRs owned by Regional Governments.

### C. Descriptive analysis discussion

The descriptive analysis that has been presented in the previous section is displayed in the form of a table containing financial ratio values that reflect the performance of People's Credit Banks (BPR) owned by the Regional Governments of West Java and Banten Provinces during the 2019–2023 period. Based on the findings of the descriptive analysis, in this section, a more in-depth discussion is carried out to obtain a comprehensive understanding of the condition of each research variable and its relationship with the problems formulated in the research. This discussion not only focuses on the development and fluctuations of each financial ratio, but also relates it to the results of the panel data regression analysis to explain the influence of Credit Risk (NPL), Liquidity Risk (LDR), and Operational Risk (BOPO) on Profitability (ROA) in BPR owned by the Regional Government.

#### 1. Descriptive Discussion of Credit Risk (NPL)

Based on the results of a descriptive analysis of 11 BPRs owned by the Regional Governments of West Java and Banten Provinces for the 2019-2023 period, the NPL ratio shows significant fluctuations both between time and between institutions. Average NPLs decreased from 6.85% in 2019 to 6.42% in 2020 and fell more sharply to 4.22% in 2021. However, in 2022 it increased again to 5.13% and jumped in 2023 to 7.35%. The minimum NPL value was recorded at 0.66% in 2019, while the maximum reached 22.32% in 2023, with a five-year average of 5.99%.

These results show that in aggregate the average NPL of BPRs owned by the Regional Governments of West Java and Banten has exceeded the maximum limit set by the regulator. This condition indicates that regional BPRs faced significant credit risk pressure during the study period, although it had improved in 2021. Theoretically, increasing NPLs will increase the need to establish credit loss reserves and reduce banks' ability to generate profits, thus negatively impacting profitability and business sustainability. Therefore, NPL control is the main prerequisite in maintaining the health and performance of BPRs.

#### 2. Descriptive Discussion of Liquidity Risk (LDR)

Based on the results of the descriptive analysis, the Loan to Deposit Ratio (LDR) ratio of BPRs owned by the Regional Governments of West Java and Banten Provinces for the 2019–2023 period shows a relatively stable tendency with moderate fluctuations. The average LDR was recorded at 84.26% in 2019, increasing to 82.42% in 2020, then decreasing slightly to 82.05% in 2021 and 82.01% in 2022, before increasing sharply in 2023 to 86.72%. The minimum LDR value was recorded at 57.70% in 2022, while the maximum reached 120.91% in 2023, with a five-year average of 83.49%.

Theoretically, LDRs reflect a balance between the intermediation function and the bank's ability to meet short-term obligations. Based on Bank Indonesia Circular Letter No. 13/24/DPNP/2011, the average LDR of 83.49% places regional BPRs at Rank 2 with the "Good" category. This shows that in aggregate BPRs owned by the Regional Governments of West Java and Banten are able to maintain liquidity at a relatively healthy level, although in BPRs and certain periods there is still potential liquidity pressure that needs attention.

#### 3. Descriptive Discussion of Operational Risk (BOPO)

Operational risks as regulated in *POJK* No. 3/*POJK*.03/2022 include risks due to inadequate internal processes, human resource errors, system failures, and external factors. In

this study, operational risk is proxied by the ratio of Operating Costs to Operating Income (BOPO). The results of the analysis showed that the BOPO BPR belonging to the Regional Governments of West Java and Banten Provinces during the 2019–2023 period fluctuated with a tendency to increase at the end of the period.

The average value of BOPO was recorded at 86.26% in 2019, decreasing to 85.49% in 2020, 84.64% in 2021, and 82.86% in 2022, but increased significantly to 89.38% in 2023. Overall, the five-year average BOPO is 85.73%, which based on SEOJK No. 11/SEOJK.03/2022 is included in the "Good" category, although it is close to the downgrade limit. This condition shows that the operational efficiency of regional BPRs is relatively maintained, but the increase in BOPO in the last year is a signal of the need to strengthen operational cost control.

#### 4. Descriptive Profitability (ROA) Discussion

Based on the results of the descriptive analysis, the Return on Assets (ROA) of BPRs owned by the Regional Governments of West Java and Banten Provinces for the 2019–2023 period showed quite real fluctuations. The average ROA was recorded at 3.28% in 2019, decreasing to 3.02% in 2020, then increasing to 3.27% in 2021 and reaching a peak of 3.56% in 2022, before decreasing significantly to 2.12% in 2023. Overall, the average five-year ROA is 3.05%, which based on SEOJK No. 11/SEOJK.03/2022 is included in the "Excellent" category.

The decrease in ROA in 2023 is in line with the increase in the BOPO ratio, which shows that the increase in operating expenses without being offset by the growth in operating income is depressing profitability. Thus, the profitability performance of BPRs is highly determined by management's ability to control credit risk (NPL), maintain liquidity balance (LDR), and improve operational efficiency (BOPO). These three ratios simultaneously form the main foundation in creating sustainable ROA and reflect the overall health level of BPR.

#### D. Discussion of Verification Analysis

The verifiable analysis aims to empirically test the influence of Credit Risk (NPL), Liquidity Risk (LDR), and Operational Risk (BOPO) on the Profitability (ROA) of BPRs owned by Local Governments. The test was conducted using panel data regression during the study period to assess the direction and significance of the influence of variables partially or simultaneously. The results of the analysis are then studied by referring to banking theory and previous research as the basis for drawing conclusions and policy implications.

#### 5. The Effect of Credit Risk (NPL), Liquidity Risk (LDR), and Operational Risk (BOPO) on the Profitability (ROA) of BPRs Owned by the Regional Governments of West Java and Banten Provinces

The results of the panel data regression test showed that simultaneously Credit Risk (NPL), Liquidity Risk (LDR), and Operational Risk (BOPO) had a significant effect on Profitability (ROA). This is evidenced by an F-statistical value of 40.25981 and a probability of 0.000000 ( $< 0.05$ ), so that the simultaneous hypothesis is accepted. The Adjusted R-squared value of 0.685643 indicates that approximately 68.56% of the variation in ROA can be explained by these three risk variables, while the rest is influenced by other factors outside the model. These findings are in line with previous research that stated that the combination of banking risks is the main determinant of BPR's financial performance.

6. The Effect of Credit Risk (NPL) on the Profitability (ROA) of BPRs Owned by the Regional Government of West Java and Banten Provinces

The test results showed that Credit Risk (NPL) had a negative but not significant effect on Profitability (ROA) (Cheng et al., 2019; Eko Muliansyah & Nurmala, 2023). This condition indicates that although the increase in NPLs has the potential to reduce profits, the impact is not statistically strong enough. This is suspected because BPRs owned by the Regional Government have applied the principle of prudence in disbursing credit, kept NPLs within the limits set by the *OJK*, and established adequate reserves for impairment losses, so that NPL fluctuations do not directly suppress profitability.

7. The Effect of Liquidity Risk (LDR) on the Profitability (ROA) of BPRs Owned by the Regional Governments of West Java and Banten Provinces

The test results showed that Liquidity Risk (LDR) had a positive but insignificant effect on Profitability (ROA). These findings indicate that increased credit disbursement relative to third-party funds has the potential to increase profits, but has not yet had a statistically significant impact. This condition reflects that the increase in profitability is not only determined by the amount of credit disbursed, but also by the quality of credit and the efficiency of fund management carried out by BPRs.

### CONCLUSION

Based on the results of the panel data regression analysis of BPRs owned by Regional Governments in West Java and Banten for the 2019–2023 period, it can be concluded that in general, BPRs are at a risk level that is still under control with an average NPL of 5.99%, LDR 73.97%, BOPO 86.75%, and ROA of 3.05%. Simultaneously, credit risk, liquidity risk, and operational risk have a significant effect on profitability. However, partially, credit risk and liquidity risk show a non-significant influence on ROA, while operational risk has a negative and significant effect on profitability, which confirms that operational efficiency is the dominant factor in determining BPR's profit performance. Therefore, BPRs are advised to continue to strengthen credit risk management, improve operational cost efficiency, maintain liquidity balance, and obtain supervisory and capital support from local governments so that profitability performance can increase sustainably.

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