

Optimizing Regional Development Banks' Role: Financial Intermediation and Inclusion for Economic Growth

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Abstract

Regional Development Banks (RDBs) play a pivotal role in fostering national economic growth through financial intermediation and expanding financial inclusion. Nonetheless, RDBs face both challenges and opportunities in extending credit to the productive sector and enhancing access to financial services for underserved communities. This study aims to examine how optimizing RDB functionality can enhance its contribution to regional economic development. The methodology employed in this research is panel data regression analysis, incorporating eight independent variables, namely Loan-to-Deposit Ratio, Non-Performing Loans, Third-Party Funds, Operating Expense Ratio to Operating Income (BOPO), Return on Equity (ROE), Bank Size, Financial Inclusion, and Inflation, with economic growth serving as the dependent variable. Data were sourced from the financial reports of RDBs, the Financial Services Authority (OJK), and the Central Statistics Agency (BPS), covering 38 RDBs and 23 banks. The findings indicate that Third-Party Funds, Non-Performing Loans, and Inflation positively and significantly influence economic growth. Conversely, Bank Size shows a negative, significant impact. The Loan-to-Deposit Ratio exhibits a positive but not statistically significant effect, whereas ROE, BOPO, and Financial Inclusion have negative and significant effects on economic growth. These results offer critical insights for optimizing the intermediation performance of RDBs in supporting sustainable economic development, particularly at the regional level, thereby providing a foundation for broader national economic advancement.

Keywords: Bank; Economic; Financial Inclusion; Size.

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I. Introduction

National economic growth is a key indicator for assessing a country's overall economic performance (Rusydziana & Ikhwan, 2024). Sustainable economic growth is largely determined by the effectiveness of the financial sector in performing its intermediary function and expanding access to financial inclusion. A well-functioning financial system can collect funds from the public and channel them to productive sectors, thereby encouraging greater economic activity more equitably and inclusively. In promoting equitable and sustainable development, Regional Development Banks (RDBs) play a strategic role as agents of regional growth and contributors to national economic expansion. Their effectiveness in financial intermediation, as reflected by indicators such as LDR, NPL, and DPK, demonstrates their ability to mobilize and allocate funds efficiently. Moreover, operational efficiency and profitability, measured by BOPO and ROE, are essential in assessing the contribution of RDBs to economic growth. Beyond its intermediary role, increasing financial inclusion is crucial to driving inclusive economic growth, particularly for MSMEs and the informal sector (Atta & Ibrahim, 2024). Bank size also plays a role, as larger banks have greater capacity to reach the public and channel financing efficiently (T. Al-Harbi, 2021). Meanwhile, macroeconomic factors, such as inflation, also influence the performance of Regional Development Banks and ultimately affect economic growth, as measured by GRDP.

A favorable condition of economic growth is indicated by a continuous increase in a region's Gross Regional Domestic Product (GRDP) each year. However, during the study period, several regions experienced a decline in GRDP, they are 4 provinces in 2022 (Bangka Belitung Island, Special Region of Yogyakarta, West Sulawesi, and Papua), 21 provinces in 2023 (Riau, Bangka Belitung Island, Jambi, South Sumatra, Bengkulu, Special Capital Region of Jakarta, West Java, Central Java, Special Region of Yogyakarta, East Java, Banten, West Nusa Tenggara, West Kalimantan, Central Kalimantan, South Kalimantan, North Kalimantan, Central Sulawesi, South Sulawesi, Southeast Sulawesi, North Maluku and Papua), and 23 provinces in 2024 (West Sumatra, Riau, Jambi, South Sumatra, Bangka Belitung Island, Riau Island, Special Capital Region of Jakarta, West Java, Central Java, Special Region of Yogyakarta, East Java, Banten, Bali, East Kalimantan, North Kalimantan, North Sulawesi, Central Sulawesi, Gorontalo, West Sulawesi, North Maluku, Papua, South Papua, and Highland Papua). This indicates that economic growth problems persist in certain regions and therefore require greater attention. The study aims to analyze the influence of LDR, NPL, DPK, BOPO, ROE (X5), Bank Size, Financial Inclusion, and Inflation on economic growth. The development of Gross Regional Domestic Product (GRDP) in each province is shown in Table 1.

Table 1. The Development of Gross Regional Domestic Product (GRDP) in Each Province

Province	2020	2021	Trend	2022	Trend	2023	Trend	2024	Trend
Aceh	-0.37	2.81	3.18	4.21	1.4	4.23	0.02	4.66	0.43
North Sumatra	-1.07	2.61	3.68	4.73	2.12	5.01	0.28	5.03	0.02
West Sumatera	-1.61	3.29	4.9	4.36	1.07	4.62	0.26	4.36	-0.26
Riau	-1.13	3.36	4.49	4.55	1.19	4.21	-0.34	3.52	-0.69
Jambi	-0.51	3.7	4.21	5.12	1.42	4.67	-0.45	4.51	-0.16
South Sumatera	-0.11	3.58	3.69	5.24	1.66	5.08	-0.16	5.03	-0.05
Bengkulu	-0.02	3.27	3.29	4.31	1.04	4.28	-0.03	4.62	0.34
Lampung	-1.66	2.77	4.43	4.28	1.51	4.55	0.27	4.57	0.02
Bangka Belitung Island	-2.29	5.05	7.34	4.4	-0.65	4.38	-0.02	0.77	-3.61
Riau Island	-3.8	3.43	7.23	5.06	1.63	5.16	0.1	5.02	-0.14
Special Capital Region of Jakarta	-2.39	3.55	5.94	5.25	1.7	4.96	-0.29	4.9	-0.06
West Java	-2.52	3.74	6.26	5.45	1.71	5	-0.45	4.95	-0.05
Central Java	-2.65	3.33	5.98	5.31	1.98	4.97	-0.34	4.95	-0.02
Special Region of Yogyakarta	-2.67	5.58	8.25	5.15	-0.43	5.07	-0.08	5.03	-0.04
East Java	-2.33	3.56	5.89	5.34	1.78	4.95	-0.39	4.93	-0.02
Banten	-3.39	4.49	7.88	5.03	0.54	4.81	-0.22	4.79	-0.02
Bali	-9.34	-2.46	6.88	4.84	7.3	5.71	0.87	5.48	-0.23

Continued on next page

Table 1—Continuation

Province	2020	2021	Trend	2022	Trend	2023	Trend	2024	Trend
West Nusa Tenggara	-0.62	2.3	2.92	6.95	4.65	1.8	-5.15	5.3	3.5
East Nusa Tenggara	-0.84	2.52	3.36	3.08	0.56	3.47	0.39	3.73	0.26
West Kalimantan	-1.82	4.8	6.62	5.07	0.27	4.46	-0.61	4.9	0.44
Central Kalimantan	-1.41	3.59	5	6.45	2.86	4.14	-2.31	4.46	0.32
South Kalimantan	-1.82	3.48	5.3	5.11	1.63	4.84	-0.27	5.05	0.21
East Kalimantan	-2.9	2.55	5.45	4.48	1.93	6.22	1.74	6.17	-0.05
North Kalimantan	-1.09	3.99	5.08	5.32	1.33	4.94	-0.38	4.57	-0.37
North Sulawesi	-0.99	4.16	5.15	5.42	1.26	5.48	0.06	5.39	-0.09
Central Sulawesi	4.86	11.68	6.82	15.22	3.54	11.91	-3.31	9.89	-2.02
South Sulawesi	-0.71	4.64	5.35	5.1	0.46	4.51	-0.59	5.02	0.51
Southeast Sulawesi	-0.65	4.1	4.75	5.53	1.43	5.35	-0.18	5.4	0.05
Gorontalo	-0.02	2.4	2.42	4.03	1.63	4.5	0.47	4.13	-0.37
West Sulawesi	-2.34	2.57	4.91	2.26	-0.31	5.23	2.97	4.76	-0.47
Maluku	-0.91	3.63	4.54	5.31	1.68	5.21	-0.1	5.34	0.13
North Maluku	5.39	16.79	11.4	22.94	6.15	20.49	-2.45	13.73	-6.76
West Papua	-0.76	-0.51	0.25	2.03	2.54	5.18	3.15	20.8	15.62
Southwest Papua	N/A	N/A	N/A	N/A	N/A	1.82	N/A	3.6	1.78
Papua	2.39	15.16	12.77	8.97	-6.19	4.22	-4.75	4.11	-0.11
South Papua	N/A	N/A	N/A	N/A	N/A	4.23	N/A	4.55	0.32
Central Papua	N/A	N/A	N/A	N/A	N/A	5.95	N/A	4.36	-1.59
Highland Papua	N/A	N/A	N/A	N/A	N/A	4.78	N/A	4.75	-0.03

A high LDR ratio indicates that banks are aggressive in distributing credit and that the intermediation function is running well, which will ultimately encourage the distribution of funds for production activities, investment, and public consumption, thereby contributing to increasing output and added value to the region's economy (Atta & Ibrahim, 2024; Murty et al., 2012; Rusydiana & Ikhwan, 2024). Therefore, a higher LDR is expected to influence regional economic growth positively. Previous research has provided different results. Previous studies have produced the significant positive effect of the LDR variable on economic growth (Rusydiana & Ikhwan, 2024; Zahra & Ajija, 2023). In addition, there is also research that provides evidence of a significant negative effect of LDR on economic growth (Sari & Baskara, 2023).

Non-Performing Loans (NPLs) are an indicator of bank asset quality that measures the percentage of non-performing loans relative to total loans disbursed. High NPLs tend to negatively affect economic growth by reducing productivity and regional economic growth rates (Nguyen, 2022; Wierzbowska, 2025; Zahra & Ajija, 2023). In addition, there is also research that provides evidence of a significant positive effect of NPLs on economic growth (Zhang et al., 2022).

Third-party funds (TPF) are funds collected by banks from the public through deposits, such as checking, savings, and time deposits. A high TPF reflects strong public trust in the banking system and substantial liquidity potential for credit. The availability of these funds provides ample scope for banks to encourage financing for various regional economic sectors, such as industry, trade, agriculture, and MSMEs (Naula et al., 2025; T. Al-Harbi, 2021).

The BOPO (Operating Cost to Operating Income) ratio measures a bank's operational efficiency. Banks with a high BOPO tend to have limited capacity to disburse credit optimally. This has implications for reduced banking support for regional economic growth, which can ultimately hinder economic growth (Kasmir, 2007).

Profitability is a key indicator of a bank's financial performance, reflecting its ability to generate profits from its available capital. Bank profitability can be measured by Return on Equity (ROE). ROE is calculated by dividing net profit after tax by total equity (Kasmir, 2007). This ratio reflects the return on shareholder investment and reflects management's efficiency in managing its equity to generate profits. A high ROE indicates a bank's ability to manage capital effectively and generate significant profits. Bank profitability plays a strategic role in supporting regional economic growth by providing credit to productive sectors such as MSMEs, agriculture, and the creative industry, which support local economic

activity (Kjosevski, 2024; Kumar & Bird, 2020). Previous research has proven that there is a positive effect between profitability and economic growth (Klein & Sharma, 2022; Ledhem & Mekidiche, 2020).

Bank size can be measured using total assets. The greater the bank's total assets, the greater its potential to perform its intermediary function, thereby increasing its ability to channel financing to economic sectors. This can encourage business expansion, increased investment, and local economic growth. Therefore, a bank's greater total assets have the potential to contribute to economic growth positively (T. Al-Harbi, 2021). On the other hand, the larger a bank's total assets, the greater the risk of managing them. If not managed properly, this can actually hinder economic growth (Kumar & Bird, 2020).

Financial inclusion is the process that enables all segments of society to access formal financial products and services in an easy, affordable, and high-quality manner. According to Presidential Regulation No. 114 of 2020 concerning the National Strategy for Financial Inclusion, the availability of financial service infrastructure is one of the key aspects in supporting the achievement of national financial inclusion targets. Increasing financial inclusion opens up greater opportunities for the public and businesses to obtain financing, manage their finances, and participate in formal economic activities, thereby indirectly driving economic growth and increasing regional economic growth (Atta & Ibrahim, 2024; Boachie & Adu-Darko, 2024; Zhang et al., 2022). Previous research found that financial inclusion does not have a significant effect on economic growth (Zahra & Ajija, 2023). Different research results have found that financial inclusion has a significant positive effect on economic growth (Boachie & Adu-Darko, 2024; Fundji, 2024; Hussain et al., 2024; Siddiki & Bala-Keffi, 2024; Zahra & Ajija, 2023; Zhang et al., 2022).

Regional inflation is a macroeconomic indicator that describes the general rate of increase in the prices of goods and services in a region over a specific period. This inflation can reflect the public's purchasing power, the stability of the regional economy, and the effectiveness of local-level fiscal and monetary policy management. According to the Central Statistics Agency (BPS), regional inflation is calculated based on the Consumer Price Index (CPI), which covers various household expenditure groups. Excessively high inflation can suppress people's purchasing power, reduce the real value of income, and create uncertainty in the business climate. Moderate inflation can encourage production and investment by reflecting increased demand. As a result, investment and consumption can decline, negatively impacting economic growth. Therefore, inflation stability is a crucial factor in maintaining the sustainability of regional economic growth (Kumar & Bird, 2020; Rusydiana & Ikhwan, 2024; Salamai et al., 2022; Tamimah et al., 2019). Previous studies found that inflation has a significant positive effect on economic growth (Khan et al., 2022; Siddiki & Bala-Keffi, 2024). In contrast, other studies concluded that inflation has a significant negative effect on economic growth (Nguyen, 2022; Rusydiana & Ikhwan, 2024).

This study offers several novelties compared to previous studies. First, it integrates banking performance variables (LDR, NPL, BOPO, ROE, TPF) with macroeconomic variables (inflation) and socio-financial indicators, such as financial inclusion, to assess their simultaneous impact on regional economic growth. Second, this study uses Regional Development Banks (BPDs) as its object, which have a dual function as financial intermediaries and regional development agents, thereby providing a new perspective on BPDs' contribution to regional economic development. Previous studies provide limited evidence on how financial inclusion and bank performance indicators jointly explain economic growth within Regional Development Banks (RDBs).

II. Method

The study population comprised all 38 Regional Development Banks (BPDs) in Indonesia. The sample was selected using purposive sampling based on the following criteria: conventional Regional Development Banks with complete financial reporting data, regional inflation, and regional economic growth for the period 2020 to 2024. Based on these criteria, 23 banks were selected as the research sample (see Table 2).

Table 2. Samples

Number	Bank Name
1	PT. BPD West Java and Banten Tbk
2	PT. BPD DKI
3	PT. BPD Special Region of Yogyakarta
4	PT. BPD Central Java
5	PT. BPD East Java Tbk
6	PT. BPD Jambi
7	PT. BPD North Sumatra
8	PT. Bank Nagari
9	PT. BPD South Sumatra and Bangka Belitung
10	PT. BPD Lampung
11	PT. BPD South Kalimantan
12	PT. BPD West Kalimantan
13	PT. BPD East Kalimantan and North Kalimantan
14	PT. BPD South Sulawesi and West Sulawesi
15	PT. BPD North Sulawesi and Gorontalo
16	PT. BPD Bali
17	PT. BPD East Nusa Tenggara
18	PT. BPD Maluku and North Maluku
19	PT. BPD Papua
20	PT. BPD Bengkulu
21	PT. BPD Central Sulawesi
22	PT. BPD Southeast Sulawesi
23	PT. BPD Banten Tbk

In this study, the data analysis techniques used include descriptive analysis and panel data regression using EViews software (Ahmaddien, 2020). The panel data regression model is formulated in Equation (1) as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \epsilon_i \quad (1)$$

Description:

Y	=	Economic growth
α	=	Constanta
β	=	Coefficient of regression
X_1	=	LDR
X_2	=	NPL
X_3	=	Third party funds
X_4	=	BOPO
X_5	=	ROE
X_6	=	Bank size
X_7	=	Financial inclusion
X_8	=	Inflation
ϵ_i	=	Error

This study employs secondary panel data comprising 115 observations. The data were obtained from annual reports available on each bank's official website, as well as regional inflation and Gross Regional Domestic Product (GRDP) data from the Central Statistics Agency (*Badan Pusat Statistik/BPS*) website (see Table 3).

Table 3. Research Variable, Operational Definitions, and Measurement

Variable	Definition	Measurement
LDR	The amount of loans disbursed by Regional Development Banks (BPD) in comparison to the amount of third-party funds (deposits) collected by the bank.	$\frac{\text{Total Loan}}{\text{Third Party Funds}}$
NPL	The amount indicates the level of problematic financing encountered by Regional Development Banks (BPD)	$\frac{\text{Total Problem Credit}}{\text{Total Loan}}$
Third-party Funds	The volume of third-party funds collected by BPD	\ln (third-party funds)
BOPO	Operating Expense to Operating Income Ratio of BPD	$\frac{\text{Operating Expense}}{\text{Operating Income}}$
ROE	The ability to generate profit from their equity	$\frac{\text{Net Profit}}{\text{Total Equity}}$
Bank Size	Total asset of BPD	\ln Total Asset
Financial Inclusion	The number of branch offices and ATMs of Regional Development Banks (BPD)	\ln (Total branch office & ATM)
Inflation	The inflation rate in each provincial region	Inflation Rate
Economic Growth	The economic growth rate in each provincial region.	Region Economic Growth

There are three models commonly used in panel data regression: the Common Effects Model (CEM), the Fixed Effects Model (FEM), and the Random Effects Model (REM). The most appropriate model in this study was selected using the Chow and Hausman tests. The conceptual framework of this study can be seen in Figure 1.

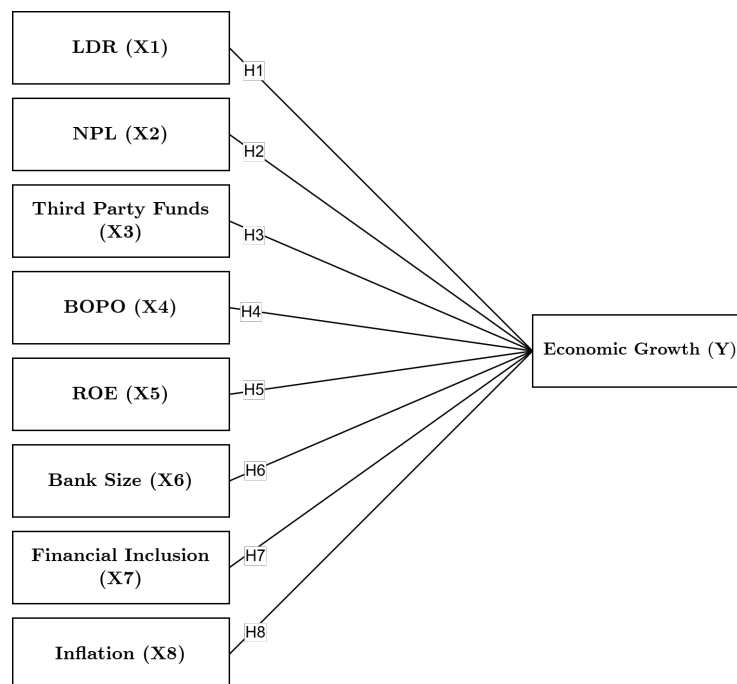


Figure 1. Conceptual Framework

III. Results and Discussion

1. Descriptive Analysis

Based on Table 4, Indonesia's average regional economic growth rate was 4.28%, indicating a relatively strong performance. Based on Table 5, the average national economic growth during the 2020–2024 period was 3.40%. This indicates that regional economic growth has been strong, exceeding the national average. The highest regional economic growth was recorded in East Kalimantan and North Kalimantan, reaching 26.6% in 2022. However, in 2023, these regions experienced a significant decline, with growth dropping to 13.61%, the lowest among all provinces.

In terms of fund distribution, Regional Development Banks (BPD) demonstrated good liquidity and successfully carried out their intermediation function, as reflected in an average Loan-to-Deposit (PPR) ratio of 89.98%. Bank Indonesia stipulates that the optimal PPR level is in the range of 78% to 92%, in accordance with Circular Letter No. 15/412/DKMP concerning the Calculation of Secondary Statutory Reserves and Statutory Reserves Based on the Loan-to-Deposit Ratio in Rupiah (2013). The highest PPR was recorded at 146.77% by PT. BPD Banten in 2020, indicating aggressive loan expansion. Conversely, the lowest PPR was recorded at 49.9% in 2022 by PT. BPD East Kalimantan and PT. BPD North Kalimantan reflects the lowest liquidity among these banks. Therefore, efforts are needed to increase the capacity of credit distribution to strengthen BPDs' role in the intermediation function.

Throughout the study period, conventional regional development banks (BPDs) in Indonesia maintained good credit quality. They effectively managed their loans, as reflected in an average non-performing loan (KPR) ratio of 0.99%. Bank Indonesia stipulates that banks' KPR ratios must be below 5%, in accordance with Bank Indonesia Regulation Number 23/2/PBI/2021, which amends Bank Indonesia Regulation Number 20/8/PBI/2018 on the Loan-to-Value Ratio for Property Loans, Financing-to-Value Ratio for Property Financing, and Down Payments for Property Loans or Financing. PT recorded the highest KPR ratio. BPD Banten Tbk at 4.51%, influenced by a high level of credit disbursement, in line with the high Loan-to-Deposit Ratio (LDR) in 2020. Although this KPR figure remains within safe limits, it underscores the importance of careful credit analysis to minimize credit risk. Conversely, the lowest KPR ratio was recorded by PT. BPD Southeast Sulawesi was -0.07%, indicating that the bank's credit loss reserves (LLP) exceeded the amount of recorded bad loans.

Third-Party Funds measured using the natural logarithm (ln), averaged 16.72, equivalent to approximately IDR 26.13 trillion. The highest value, 18.73, was recorded by PT. BPD Jawa Barat and Banten Tbk in 2024, with total deposits amounting to IDR 136.30 trillion, indicating the bank's strong capacity in fund mobilization. The lowest Third Party Funds value was 14.76, recorded by PT. BPD Banten Tbk in 2020, with total deposits of IDR 2.58 trillion.

The average BOPO (Operating Cost to Operating Income Ratio) of Regional Development Banks (BPD) is 79.62%, reflecting quite good operational efficiency. According to Circular Letter No. 13/24/DPNP concerning the Assessment of the Health Level of Commercial Banks (2011) and Financial Services Authority Regulation No. 4/POJK.03/2016 concerning the Assessment of the Health Level of Commercial Banks (2016), a bank is considered stable if its BOPO ratio remains below 89%. The highest BOPO ratio was 164.9% recorded by PT. BPD Banten Tbk in 2020 indicates operational inefficiency, where operating expenses exceed operating income. Conversely, the lowest BOPO ratio was 60.58% recorded by PT. BPD Southeast Sulawesi in 2023, indicating the highest level of efficiency among BPD banks.

Overall, the average Return on Equity (ROE) of Regional Development Banks (BPD) is 12.43%, indicating that these banks are still not optimal in generating profits from their shareholders' equity. Based on Bank Indonesia Regulation Number 13/1/PBI/2011 on the assessment of the health level of commercial banks, a bank is considered financially healthy if its ROE exceeds 23%, indicating its ability to generate significant profits relative to shareholders' equity. The highest ROE was recorded at 25.37% by PT. BPD Southeast Sulawesi in 2023, indicating a strong level of profitability. Conversely, PT recorded the lowest ROE of -47.96%. BPD Banten Tbk in 2020, indicating a very significant loss.

Bank size, measured using the natural logarithm (ln) of total assets, had an average value of 17.03, equivalent to IDR 36.76 trillion. The largest bank was PT. BPD Jawa Barat and Banten in 2024, with a log value of 19.21 and total assets amounting to IDR 219.99 trillion. The smallest bank was PT. BPD Banten Tbk in 2020, with a log value of 15.49 and total assets of IDR 5.34 trillion.

Financial inclusion, measured by the natural logarithm (ln) of the total number of branch offices, had an average value of 6.16, equivalent to 637 offices. The highest value was 7.9, and the lowest was 4.98,

indicating relatively even distribution across regions. PT recorded the highest financial inclusion. BPD Jawa Barat and Banten Tbk, with 2,689 service points (branch offices and ATMs), while PT recorded the lowest. BPD Central Sulawesi has only 146 service points.

Indonesia's average inflation rate during the research period was 2.17%, indicating relatively stable inflation. Mild inflation (creeping inflation) refers to a condition in which the inflation rate remains below 10%, with prices increasing slowly and at a relatively low rate over an extended period (Rangkuty et al., 2022). The highest inflation occurred in Sumatra Barat in 2022, while the lowest was recorded in Sulawesi Utara and Gorontalo in 2024.

Table 4. Summary of Descriptive Statistics

Variable	Mean	Median	Maximum	Minimum
Economic Growth	4,280,261	4.49	26.6	-13.81
LDR	8,498,243	84.67	146.77	49.9
NPL	0.990174	0.75	4.51	-0.07
Third-party Funds	167,167	16.73	18.73	14.76
BOPO	7,962,052	78.65	164.9	60.58
ROE	1,243,348	13.54	25.37	-47.96
Bank Size	1,703,261	17.03	19.21	15.49
Financial Inclusion	6,161,391	6.03	7.9	4.98
Inflation	2,166,348	1.56	7.43	-0.18

Table 5. Descriptive Statistics of Indonesia's National Economic Growth (2020–2024)

Year	Indonesia's National Economic Growth (%)
2020	-2.07
2021	3.69
2022	5.31
2023	5.05
2024	5.03
Average	3.40

2. Model Selection

Determining the appropriate model in data analysis using EViews, particularly for panel data regression, involves three main tests performed in stages. The goal of these tests is to select one of three available estimation models: the Common Effects Model (CEM), the Fixed Effects Model (FEM), or the Random Effects Model (REM).

2.1. Chow Test

Since the p-values for both the cross-section F test and the cross-section Chi-Square test are below the 0.05 significance level, it can be concluded that the Fixed Effect Model (FEM) is the appropriate model for this study (Basuki, 2021). Chow Test Result can be seen in Table 6.

Table 6. Chow Test Result

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.128267	(22,84)	0.0074
Cross-section Chi-square	50.947275	22	0.0004

2.2. Hausman Test

The Hausman test yields a p-value of 0.0013, which is below the 0.05 threshold, indicating that the Fixed Effects Model (FEM) is the most suitable model for this analysis (Basuki, 2021). The result of Hausman Test is displayed in Table 7.

Table 7. Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	25,426,590	8	0.0013

3. Regression Result and Hypothesis Test

Based on Table 8 (Fixed Effect Model), the estimation results show that Third Party Funds (TPF), Non-Performing Loans (NPL), and inflation have a positive and significant effect on economic growth, as reflected in probability values below 5 percent. Conversely, bank size has a negative and significant effect, indicating that increasing bank scale does not necessarily drive regional economic growth. On the other hand, the Loan to Deposit Ratio (LDR), BOPO, ROE, and financial inclusion do not show a significant effect, although the signs of the coefficients vary. The results of this study indicate that regional economic growth is more influenced by the ability to raise funds, credit quality, and macroeconomic stability than by bank efficiency and profitability.

Table 8. Fixed Effect Model (FEM) Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-207.7741	74.78841	-2.778159	0.0067
LDR	0.054726	0.068498	0.798946	0.4266
NPL	2.045962	0.923926	2.214423	0.0295
Third Party Fund	38.48439	11.14697	3.452453	0.0009
BOPO	-0.071805	0.085816	-0.836730	0.4051
ROE	-0.041382	0.148891	-0.277937	0.7817
Bank Size	-25.34403	9.506459	-2.665980	0.0092
Financial Inclusion	-0.258798	2.762903	-0.093669	0.9256
Inflation	0.714143	0.227869	3.134008	0.0024
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.488472	Mean dependent var	4.280261	
Adjusted R-squared	0.305784	S.D. dependent var	4.768942	
S.E. of regression	3.973465	Akaike info criterion	5.822169	
Sum squared resid	1326.228	Schwarz criterion	6.562108	
Log likelihood	-303.7747	Hannan-Quinn criter.	6.122507	
F-statistic	2.673799	Durbin-Watson stat	2.258991	
Prob(F-statistic)	0.000225			

The Effect of LDR on Economic Growth

The research findings indicate that the Loan-to-Deposit Ratio (LDR) has a positive but statistically insignificant effect on economic growth. A higher LDR indicates the bank's greater capacity to extend credit using third-party funds. An increasing LDR indicates strong bank liquidity and suggests that the intermediary function of Regional Development Banks (BPDs) is working effectively. While an increase in LDR can potentially enhance economic growth, the effect is not strong. This lack of significance may result from the suboptimal allocation of BPD credit to business and productive sectors. Currently, credit distribution among BPDs remains largely concentrated in consumer loans.

According to the Financial Services Authority, as of December 2023, conventional BPD credit was

dominated by consumer loans at 64.64%, followed by working capital loans at 21.00%, and investment loans at only 14.36% (Otoritas Jasa Keuangan, 2024). Additionally, the operational scope of BPDs remains limited to provincial areas, thus not reaching all business activities across Indonesia. To enhance their intermediary role, RDBs should not only increase the volume of credit distribution but also consider credit quality and allocate more resources toward productive sectors or large-scale businesses that have a greater impact on economic growth. RDBs can collaborate with local governments to identify each region's competitive advantages, thereby optimizing banks' role as financial intermediaries and more effectively supporting regional economic development. These findings align with the study, which found that the volume of loans in banks had a negative but not significant impact on economic growth (T. Al-Harbi, 2021). However, the results differ, with some studies finding that bank credit had a significant positive impact on economic growth (Rusydziana & Ikhwan, 2024). Another result found that credit ratios had a positive and significant effect on economic growth (Zahra & Ajija, 2023). The different results indicate that LDR had a significantly negative effect on economic growth.

The Effect of NPL on Economic Growth

The research results show that non-performing loans (NPLs) have a significant positive effect on economic growth. Theoretically, higher NPLs tend to reduce economic growth. However, these findings actually suggest that increasing NPLs can contribute to economic growth. This may be due to the Regional Development Banks' (BPDs) ability to provide high-risk loans to productive sectors that can generate income and create jobs. These business sectors have the potential to stimulate regional consumption and production, thereby boosting economic growth in those areas. Higher NPLs indicate that banks face increased credit risk, which may reflect a decline in bank performance. Bank Indonesia stipulates that banks' non-performing loan (NPL) ratios must be below 5%, as stipulated in Bank Indonesia Regulation Number 23/2/PBI/2021 concerning the Third Amendment to Bank Indonesia Regulation Number 20/8/PBI/2018 concerning the Loan-to-Value Ratio for Property Loans, the Financing-to-Value Ratio for Property Financing, and Down Payments for Property Loans or Financing (2021). During the study period, several banks demonstrated aggressive lending practices, reflected in Loan-to-Deposit Ratios (LDRs) exceeding 100%, yet still managed to maintain NPL ratios below 5%. This demonstrates that Regional Development Banks (BPDs) can manage their loans prudently through sound credit analysis and effective oversight. Therefore, this situation does not necessarily weaken the banks' performance. However, going forward, these banks must continue to improve the quality of their lending practices to minimize risk and ensure continued strong performance.

The results of this study are consistent with Sari and Baskara (2023) and Wierzbowska (2025), which shows that non-performing loans (NPLs) have a significant negative impact on economic growth. Other studies also show that the credit ratio has a significant negative impact on economic growth (Nguyen, 2022). However, other studies have found that non-performing loans (NPLs) can actually stimulate economic activity in a country, thus contributing to increased economic growth (Zhang et al., 2022).

The Effect of Third-Party Funds on Economic Growth

The study's results indicate that third-party funds at Regional Development Banks have a significant positive effect on economic growth. The higher the bank's third-party funds, the greater the amount of public savings deposited in the Regional Development Banks. This is supported by the average trend of third-party funds, which increased by 0.07% during the study period. This condition reflects growing public trust in Regional Development Banks. These public savings are then redistributed by the bank in the form of credit and allocated to sectors that contribute to economic growth, such as MSMEs, trade, agriculture, tourism, and others, thereby increasing economic growth by 1.12% over the study period. Regional Development Banks also need to establish effective and efficient fundraising strategies by enhancing financial literacy, improving digital transaction services, and offering more competitive deposit products. The stronger the role of Regional Development Banks in mobilizing and managing deposit funds, the greater their contribution to economic growth. These findings support previous research, which demonstrated that third-party fund sources have a significant positive impact on economic growth (Zahra & Ajija, 2023).

The Effect of BOPO on Economic Growth

The study's results indicate that BOPO has a negative but insignificant effect on economic growth. The negative effect suggests that a lower BOPO ratio indicates greater bank efficiency, as the bank manages its operational expenses more effectively relative to its operating income. During the study period, the average BOPO ratio of Regional Development Banks declined by 0.89%. This banking efficiency can enhance the bank's role as a financial intermediary, thereby contributing to regional development and economic growth. This is reflected in the average trend of economic growth, which increased by 1.12% over the same period. However, the insignificance of BOPO's effect on economic growth suggests that it does not strongly drive economic growth. This may be due to the suboptimal role of Regional Development Banks in channeling credit to productive sectors, as well as to external factors that influence economic growth. Therefore, local governments also play a crucial role in encouraging banks to extend credit to productive sectors that have a greater impact on regional economic growth.

The Effect of ROE on Economic Growth

The study's results indicate that ROE has a negative but insignificant effect on economic growth. The direction of the negative effect indicates that a lower ROE reflects the Regional Development Bank's lower ability to generate profits from its equity. This is reflected in the average ROE trend during the study period, which decreased by -0.05. However, this decrease in ROE was accompanied by an increase in economic growth, as indicated by the average growth rate rising by 1.12%. This insignificant effect indicates that ROE does not yet have a strong influence on economic growth. A high ROE does not always align with the efficient allocation of funds to sectors that require capital for business expansion or regional investment. This finding contradicts previous studies showing that bank profitability, as measured by ROA, has a significant positive effect on economic growth (Kjosevski, 2024; Klein & Sharma, 2022; Sari & Baskara, 2023). It also differs from findings that ROE has a significant positive effect on growth (Ledhem & Mekidiche, 2020).

The Effect of Bank Size on Economic Growth

The study finds that bank size has a significant negative effect on economic growth. The growth in its total assets can identify a large bank. In theory, larger banks have greater potential to perform their role as financial intermediaries and expand their credit distribution, which in turn can boost regional economic growth (Kasmir, 2007). However, the study findings indicate that the larger the size of Regional Development Banks, the lower the economic growth. The large size of banks often leads to complex internal bureaucracy, slowing down the credit process and making it less responsive to the needs of productive sectors in the region. Banks also allocate their assets to other, more profitable investment instruments such as securities.

The dominance of large banks may suppress the role of smaller banks, which are actually better positioned to meet credit needs in the micro, small, and medium enterprise sectors. Large banks are concentrated in major cities, resulting in less equitable credit distribution across regions. Consequently, businesses in underdeveloped areas have limited access to banking services, which slows economic growth. These findings are consistent with previous studies, which found that bank size has a significant negative effect on economic growth (Kumar & Bird, 2020; Wierzbowska, 2025).

The Effect of Financial Inclusion on Economic Growth

The results of the study show that financial inclusion by Regional Development Banks has a negative, but insignificant, effect on economic growth. The negative sign indicates that the greater the bank's financial inclusion, the lower the economic growth. This implies that the access to banking service networks provided by the banks, such as branch offices, cash offices, functional offices, payment point services, mobile cash units, and ATMs, has not had a strong impact in reducing the decline in economic growth.

Theoretically, the expansion of financial inclusion by Regional Development Banks (RDBs) should reach groups that previously lacked access to banking services, potentially boosting regional economic growth. However, the effect's insignificance can be attributed to several factors. First, the increase in

the number of service outlets has not been matched by increased financing to productive sectors, thereby weakening the banks' intermediation function. Second, financial literacy regarding banking products and services is still uneven. A lack of financial literacy among the public, especially in underdeveloped or remote areas, makes it difficult for people to access and use banking services due to the physical distance from banking networks. Third, in the current era of digitalization, banking services are increasingly shifting toward digital banking. Modern communities today prefer conducting their banking transactions via mobile, internet, or SMS banking rather than visiting a physical bank office. This is because digital banking offers the convenience of conducting transactions anytime, anywhere, making it more effective and efficient. However, most people still use digital banking services primarily for consumption purposes. Fourth, Regional Development Banks are often more focused on managing local government funds, thereby limiting their contribution to economic growth through financial inclusion. This study is consistent with the previous research, which found that financial inclusion, measured by the number of bank offices, does not have a significant effect on economic growth. This is because the banking industry has shifted toward digital banking, where people are more likely to use mobile and online banking rather than visiting bank branches. Different research results found that financial inclusion has a significant positive effect on economic growth (Boachie & Adu-Darko, 2024; Hussain et al., 2024; Siddiki & Bala-Keffi, 2024; Zahra & Ajija, 2023; Zhang et al., 2022).

The Effect of Inflation on Economic Growth

The study's results show that inflation has a significant positive effect on economic growth. Inflation occurs when public demand for goods and services increases. The rise in prices and demand encourages producers and other business actors to expand production to meet the surge. This increase in production capacity can contribute to economic growth. This condition indicates that inflation can stimulate active economic activity.

During the study period, the average inflation trend increased by 0.2% per year. This suggests that although the inflation rate increased slowly over time, economic growth still rose, as evidenced by a 1.12% increase in the average trend of GRDP. However, this also requires attention, as rapid inflation may erode public purchasing power and businesses' ability to produce goods and services, thereby hindering economic growth. Therefore, Bank Indonesia's role is crucial in controlling inflation to support economic growth through monetary policy. Controlled inflation creates a healthier business climate, boosts consumption, and encourages investment. The results of this study are consistent with the previous studies, which found that inflation has a significant positive effect on economic growth (Khan et al., 2022; Zahra & Ajija, 2023). In contrast, different results were concluded that inflation has a significant negative effect on economic growth (Nguyen, 2022; Rusydiana & Ikhwan, 2024).

IV. Conclusion

The theoretical implications indicate that financial intermediation theory supports regional economic development, where banks not only act as intermediaries for funds but also as drivers of regional economic growth. Economic growth is a crucial aspect for regional development, and its indicator is reflected in the Gross Regional Domestic Product (GRDP). The findings of this study reveal that the Loan-to-Deposit Ratio (LDR) has a positive but insignificant effect on economic growth. Non-Performing Loans (NPL), Third-Party Funds, and Inflation have a significant positive effect on economic growth. The empirical implications indicate that regional banks need to improve the collection of third-party funds (DPK) and effectively manage credit quality (NPL). Bank size has a significant negative effect on economic growth. Empirical evidence indicates that large banks face challenges in efficiently distributing credit. Meanwhile, the Operating Expenses to Operating Income ratio (BOPO), Return on Equity (ROE), and financial inclusion have a negative but insignificant effect on economic growth. The empirical implications indicate that banks need to balance profitability and efficiency with economic development goals and implement appropriate policies to expand financial services to support economic growth. Regional Development Banks (RDBs) need to be revitalized as development agents that are not solely profit-oriented, but also committed to equitable distribution and sustainable economic growth. An integrative approach that combines sound financial intermediation and the enhancement of financial inclusion is key to increasing the tangible contribution of RDBs to national economic growth. Suggestions for further research include adding other variables, such as the CAR ratio or banking digitalization.

Furthermore, moderating variables such as bank size could be included. Further research could expand to include a larger number of conventional commercial banks, thereby providing more comprehensive results on economic growth in Indonesia.

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