Determinants of Bank Profitability in Microfinance Banks: A Case Study of Bank Rakyat Indonesia (BRI) for the Period (2005-2024).

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Abstract: This study aimed to identify the determinants of banking profitability in one of the largest microfinance banks in the world, Bank Rakyat Indonesia (BRI), over the period 2005–2024. Using the Autoregressive Distributed Lag (ARDL) model, the study analyzed the impact of capital adequacy, liquidity, and operational efficiency on Return on Assets (ROA). The results showed that operational efficiency (BOPO) is the main determinant, exerting a strong negative effect on profitability, confirming that the success of microfinance banks depends on controlling the high operating costs associated with small-scale lending. The study also revealed the existence of a long-run equilibrium relationship (cointegration) among the variables.

Keywords: Microfinance, Bank Profitability, Bank Rakyat Indonesia (BRI), Operational Efficiency (BOPO), Cointegration

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1. Introduction

The banking sector represents the core engine of any modern economy, as financial institutions play the role of intermediaries that channel savings into productive investments within the real economy. In recent decades, microfinance has emerged as a strategic instrument not only for promoting financial inclusion and social equity, but also for evolving into a profitable and sustainable segment that enhances the long-term viability of the banking institutions adopting it.

Bank profitability is widely regarded as a key indicator of institutional performance, reflecting the efficiency with which management allocates available resources and transforms risks into returns that ensure the continuity of the bank's developmental role. In this context, the experience of Bank Rakyat Indonesia (BRI) stands out as a remarkable case study. Its success did not occur by chance; rather, it is the result of a well-balanced strategy combining a strong focus on microfinance with an accelerated digital transformation process. Consequently, analysing its financial performance becomes essential for understanding the main growth drivers within emerging banking institutions.

This orientation leads directly to the central research problem addressed in this study, which investigates the impact of internal financial determinants on the profitability of Bank Rakyat Indonesia (BRI). Despite the bank's adherence to internationally recognized standards of safety and liquidity, operational efficiency remains a persistent challenge. This raises the main research question**:**

how do solvency, liquidity, and efficiency indicators influence the profitability of BRI over the period 2005–2024?

This research problem is further broken down into two sub-questions. The first examines the nature of the impact exerted by operational efficiency (BOPO) and capital adequacy (CAR) on profitability, both in the short and long run. The second seeks to determine whether a long-run equilibrium relationship, known as cointegration, exists between these determinants and overall profitability.

Hypothesis :To investigate how the study variables interact and to provide answers to the central research question, the present study proposes the following hypotheses:

-The study assumes that there is an inverse relationship between operational efficiency and bank profitability, meaning that improvements in operational efficiency are associated with higher levels of profitability.

-It is also assumed that capital adequacy is negatively related to bank profitability, as higher capital adequacy ratios tend to reduce profitability due to the increased opportunity cost of holding idle reserves.

-The study further hypothesizes the existence of a long-run cointegration relationship between the selected independent variables (operational efficiency and capital adequacy) and bank profitability, indicating a stable equilibrium linkage among these financial indicators over time.

-Study Significance : This study derives its significance from its contribution to enriching the financial literature, particularly in relation to the application of Autoregressive Distributed Lag (ARDL) models in assessing the performance of microfinance-oriented banking institutions. It aims to provide clear and insightful guidance for decision-makers at Bank Rakyat Indonesia (BRI) by identifying the most sensitive and influential variables affecting profitability, especially in the context of digital transformation and cost optimization.

-Objectives of the Study : Practically, this study aims to measure the impact of financial variables (safety, liquidity, and efficiency) on profitability, as well as to determine the speed at which the bank can restore its equilibrium after any financial shock, using the error correction coefficient.

Methodology: To achieve the aforementioned objectives, the study adopts a descriptive-analytical approach to interpret and examine the bank's data, along with an econometric approach using the Autoregressive Distributed Lag (ARDL) model to estimate the relationships between the variables in both the short and long run.

Spatial and Temporal Scope:Spatially, the study is confined to Bank Rakyat Indonesia (BRI). Temporally, the analysis covers the period from 2005 to 2024. It should be noted that the requirements of the econometric model (lag structure) will automatically lead to the exclusion of two years of data from the analysis.

Previous Studies

-With regard to previous literature, (Cull, R. Demirgüç-Kunt, A. & Morduch, J., 2007)conducted a comprehensive global study aimed at examining the complex relationship between profitability and outreach to poor populations. The research relied on high-quality data covering 124 microfinance institutions across 49 countries. The authors focused on assessing the impact of financial variables, including financial self-sufficiency, return on assets (ROA) as an indicator of profitability, and labor costs, on social outreach indicators such as average loan size and the proportion of female borrowers. The study also compared individual lending methodologies with group lending approaches. The findings revealed that more than half of the institutions analyzed achieved actual profitability after appropriate accounting adjustments. It was also observed that increasing interest rates improves profitability for individual lenders up to a certain threshold, beyond which higher charges do not necessarily lead to better financial performance. Overall, the study concluded that it is possible to achieve financial sustainability while maintaining strong outreach to the poor and women, thereby rejecting the notion of a widespread "mission drift" among sustainable microfinance institutions.

-In another study, (Maurer, 2004)compared the financial performance of self-sustaining microfinance institutions with both non-sustainable institutions and regional commercial banks operating in developing countries. Their analysis evaluated financial performance and efficiency using key indicators such as ROA, ROE, and net profit margin, based on the CAMEL rating framework. The results showed that 57 self-sufficient microfinance institutions demonstrated strong financial performance and, in some cases, even outperformed traditional commercial banks in developing economies. However, the overall sample, including subsidized institutions, exhibited relatively weak performance, leading to the conclusion that providing financial services to the poor is highly costly and that many institutions cannot achieve sustainability without continuous donor support.

-In a complementary line of research, Cull, Demirgüç-Kunt, and Morduch (2013) investigated the impact of commercial banking penetration on the profitability and outreach of microfinance institutions. The study analyzed how banking competition and financial environment shape institutional strategies, using bank penetration (both demographic and geographic) as an independent variable, while dependent variables included average loan size and female client targeting. The results indicated that increased banking competition plays a decisive role: as commercial banks expand their presence in a country, microfinance institutions tend to shift

toward serving poorer segments by offering smaller loans and increasing outreach to women. This effect is particularly strong among commercially oriented microfinance institutions that rely primarily on individual lending models.

-Finally, the MEDA-Tempus project (Marcolino, 2006) compiled a set of case studies from several Arab countries, including Morocco, Palestine, Jordan, Egypt, and Syria, in order to analyze different institutional approaches and strategic orientations. The study compared the "institutional approach," which emphasizes financial sustainability and profitability to attract capital, with the "social approach," which prioritizes depth of outreach and relies on continuous donor funding. The findings highlighted that group lending mechanisms significantly reduce credit risk and enable access to clients without formal collateral. However, the pursuit of financial sustainability may sometimes push institutions toward relatively less poor clients in order to reduce operational costs. Nevertheless, the study also showed that well-performing institutions are capable of simultaneously achieving operational efficiency and contributing to poverty reduction.

2. Theoretical and Conceptual Framework of Microfinance Banks.

Microfinance is considered one of the modern financial mechanisms designed to support low-income populations and enable them to establish and develop small economic activities. Microfinance banks play a significant role in promoting financial inclusion and reducing poverty by providing financial services tailored to the needs of these groups. In this context, this section examines the theoretical and conceptual framework of microfinance banks, highlighting their main characteristics and objectives.

2.1. Concept of Microfinance Banks and the Difference Between Them and Traditional Banks.

2.1.1. Definition of Microfinance Banks : Microfinance banks are intermediary financial institutions specialized in providing financial services, such as loans, savings, and insurance, to low-income households and microenterprises that lack access to the formal banking sector (Maurer, 2004, p. 02). These banks, in their "commercial" form, are characterized by their pursuit of financial sustainability, meaning their ability to cover all operational costs and risks through self-generated revenues without relying on grants (Robinson M. S., 2001, p. 04).

2.1.2. The Difference Between Microfinance Banks and Traditional Banks : To clearly understand the nature of these institutions, it is necessary to compare them with conventional banks. Several key differences can be identified as follows:

-Target clients: While traditional banks mainly focus on middle- and high-income customers and often overlook poor and rural markets, microfinance banks primarily target low-income and marginalized groups, considering them their main client base(Cull, R. Demirgüç-Kunt, A. & Morduch, J., 2007, p. 01).

-Lending methodology: Traditional banks rely heavily on tangible collateral such as property and physical assets. In contrast, microfinance banks use alternative collateral mechanisms, including personal reputation, social ties, and incentive-based systems designed to ensure loan repayment(Robinson M. S., 2001, p. 09).

-Cost structure: These institutions face an operational paradox; despite the small size of individual loans, the transaction and administrative costs per loan are relatively high (high

transaction costs), which requires highly efficient management to avoid losses and ensure sustainability(Maurer, 2004, p. 04).

Operational dynamics: Microfinance banks are characterized by flexibility and speed in procedures, as they avoid complex bureaucratic processes and adopt simplified, rapid lending mechanisms suited to the needs of small borrowers(Maurer, 2004, p. 08).

2.2 Types of Microfinance Banks and Their Practical Applications

To gain a clearer understanding of microfinance institutions, it is essential to recognize that they are not homogeneous in their structure or mode of operation. Rather, they can be categorized based on their operational approach and institutional affiliation into several main types (Cull, R. Demirgüç-Kunt, A. & Morduch, J., 2007, pp. 1-3).

2.2.1. Commercial Microfinance Banks: These institutions operate under strict prudential banking regulations and typically mobilize funding through customer deposits and market-based financial resources. A prominent example is Bank Rakyat Indonesia (BRI), which serves as the focal case in this study and represents a leading model of commercially oriented microfinance.

2.2.2. Non-Governmental Organizations (NGOs): These entities are primarily motivated by social development objectives rather than profit maximization. They often rely on donor funding and implement group lending methodologies. The Grameen Bank in its early development phase is a well-known example of this model.

2.2.3. Individual Contract-Based Microfinance Institutions: This category includes institutions that adopt a bilateral lending framework, in which loans are granted through direct contracts between the institution and individual small-scale entrepreneurs, without reliance on group mechanisms(Cull, R. Demirgüç-Kunt, A. & Morduch, J., 2007, p. 1).

2.2.4. Islamic Microfinance Institutions: These institutions operate within Islamic financial principles and are widely present in several Arab countries, including Sudan and Saudi Arabia. They utilize Sharia-compliant instruments such as Murabaha and Musharakah, which are adapted to the socio-economic needs of local communities(Atiya & Kandouz, 2021).

2.3. The Bank Rakyat Indonesia (BRI) Experience: Transformation Path and Competitive Achievements

2.3.1. Overview of Bank Rakyat Indonesia (BRI): Bank Rakyat Indonesia (BRI) is the oldest state-owned bank in Indonesia and represents one of the most remarkable transformation cases in modern banking history. In 1984, it shifted from a loss-making institution heavily dependent on government subsidies into the world's largest and most successful sustainable microfinance system. It is widely known for its Unit System, a model that transformed rural lending from a purely social service into a highly profitable commercial activity(Robinson M. S., 2005, p. 3).

Historically, BRI's evolution can be divided into two contrasting phases. The first phase (1970–1983) was characterized by subsidized lending and strong reliance on government grants, which led to weak financial discipline and high default rates(Robinson M. S., 2005, p. 5). The second phase, beginning in 1984 and continuing to the present, involved a strategic transformation in which rural units were converted into autonomous profit centers. During this phase, pioneering financial products were introduced, such as the KUPEDES loan and the SIMPEDES savings program, which successfully attracted rural deposits on a large scale(Maurer, 2004, p. 2). This strong institutional structure enabled the bank to demonstrate exceptional resilience during the1997 Asian Financial Crisis and the 2020 COVID-19 crisis(BankRakyat., 2024, p. 113).

2.3.2.Key Services and Competitive Advantages Compared to Rival Banks:In today's highly competitive and rapidly evolving banking environment, BRI recognized that survival requires more than offering conventional services. Its services are mainly divided into two core products: the KUPEDES general rural loan, which is an individual lending product characterized by simplicity and flexibility suited to rural conditions (Maurer, 2004, p. 8), and the rural savings account system (SIMPEDES), a savings program designed for rural populations that has achieved remarkable success in mobilizing deposits(Robinson M. S., 2005, p. 10).

BRI's competitive advantages can be summarized as follows:

-Profit center system: Each rural unit operates as an independent accounting entity, which significantly enhances efficiency(Maurer, 2004, p. 2).

-Self-financing model: The bank relies primarily on local deposits rather than external borrowing, protecting it from market volatility(Maurer, 2004, p. 13).

-Incentive system (IPTW): Interest discounts are offered to disciplined borrowers, which has significantly reduced non-performing loans (NPLs) to minimal levels. (Robinson, 2005, p. 9)

-Geographical outreach: The bank operates the largest branch and mobile unit network, reaching remote and isolated villages that major commercial banks cannot serve. Its services cover between 58,000 and 67,000 villages, representing approximately 77% to 80% of Indonesia's total villages. (Bank Rakyat Indonesia, 2024,

2.3.3.The Impact of Bank Rakyat Indonesia on Indonesia and Its Achievements:BRI has significantly transformed the Indonesian economy, evolving from a local institution into a global model through its success in promoting financial inclusion and reaching millions of rural households that were previously excluded from the formal banking system (more than 30 million depositors and 3 million borrowers at the time of reporting(Robinson M. S., 2005, p. 10)

-Resilience during crises: During the Asian Financial Crisis (1997), BRI's microfinance segment proved to be the only stable part of the Indonesian banking system, as clients continued to repay loans and maintain savings. (Robinson, 2005, p. 14) In addition, during the COVID-19 crisis, the bank supported recovery efforts by restructuring loans worth 186.6 trillion rupiah to assist approximately 2.8 million affected borrowers by December 2020(BankRakyat., 2024, pp. 12-13).

-Independence from government subsidies: The bank reduced the fiscal burden on the state by eliminating losses previously covered by government subsidies and transforming into a profit-generating and tax-contributing institution(Robinson M. S., 2005, p. 26).

-Digital achievements: BRI achieved a major digital breakthrough through its BRImo application in 2024 and contributed to building the "Ultra Micro" ecosystem to support the smallest enterprises. This innovation led the bank to win the Top Innovation Choice Award for its digital services and transactions(BankRakyat., 2024, p. 174).

-Global model status**:** BRI has become a "global laboratory," frequently visited by international delegations seeking to learn from its experience in combining profitability with poverty alleviation (double bottom line)(Robinson M. S., 2001, p. 67).

3. Theoretical and Analytical Framework of Financial Profitability Determinants

The analysis of the financial performance of microfinance institutions represents a complex issue that goes beyond the classical objective of profit maximization, focusing instead

on the ability of these institutions to achieve financial sustainability while maintaining their social mission. Profitability is not viewed as an exploitative goal but rather as a necessary condition for institutional survival, client expansion, and independence from external subsidies(Cull, R. Demirgüç-Kunt, A. & Morduch, J., 2007, pp. 30-32).

3.1. Return on Assets (ROA)

ROA is considered the most comprehensive indicator for evaluating managerial efficiency in utilizing bank assets to generate income. The experience of BRI demonstrates a structural transformation that shifted ROA from negative levels to values exceeding those of conventional commercial banks, particularly during the 1997 Asian crisis, reaching 4.9%, and increasing further to 6.1% in 1999(Robinson M. S., 2001, p. 66)

3.2. Capital Adequacy Ratio (CAR)

CAR serves as a critical buffer against potential financial shocks. A strong capital base sends positive signals to the market and strengthens the confidence of depositors and lenders(BankRakyat., 2024, p. 744)It enhances funding conditions and improves profitability margins. Unlike traditional assumptions, some studies (Kumar, 2015, pp. 30-31)found a negative relationship between CAR and ROA in microfinance institutions in Pakistan, suggesting that higher capital levels may reduce profitability rather than enhance it.

3.3 Loan-to-Deposit Ratio (LDR)

LDR reflects the bank's liquidity management and financial intermediation strategy. BRI's success is strongly linked to its savings products such as SIMPEDES, which mobilized low-cost deposits later used to finance microloans (KUPEDES). (Maurer, 2004, p. 3)Maintaining LDR within safe limits improves resource utilization and supports profitability, provided liquidity regulations are respected. In 2024, the ratio remained at 88.85% overall and 89.39% for the bank individually, staying below the 90% risk threshold(BankRakyat., 2024, p. 47).

3.4. Operational Efficiency (BOPO)

In terms of cost dynamics, the BOPO ratio (operating expenses to operating income) is a key determinant. Due to the fragmented nature of microloans, administrative and monitoring costs tend to be high. (Cull, Demirgüç-Kunt&Morduch, 2007, p. 6) However, empirical findings (Jørgensen, 2011, pp. 69-70)challenge classical theory by showing that higher operating expenses can positively affect ROA and profitability during expansion phases, especially when supported by external funding.

3.5. Non-Performing Loans (NPL)

Loan portfolio quality is one of the most critical threats to microfinance stability. BRI introduced incentive-based repayment systems to reduce default risk and minimize NPL levels(Jørgensen, 2011, pp. 69-70). A systematic review by Fonseca et al. (2024) confirms that rising NPLs require higher provisioning, which reduces net income and negatively affects ROA.

3.6. Net Interest Margin (NIM)

NIM reflects pricing efficiency, representing the difference between returns on assets and funding costs. Microfinance institutions typically require higher interest margins than conventional banks due to higher risk exposure(Jørgensen, 2011, p. 31). Maintaining a positive and stable NIM is essential for achieving financial self-sufficiency. A study by AbuKarsh (2022) argues that unregulated interest rate policies can hinder the growth of the microfinance sector.

4. Econometric Study and Results Discussion (Case of Bank Rakyat Indonesia)

4.1 Methodological Framework and Model Specification

To empirically test the theoretical hypotheses, this study adopts an econometric approach aimed at measuring the impact of financial variables on BRI's profitability over the period 2005–2024, The Autoregressive Distributed Lag (ARDL) model was selected due to its efficiency in handling time series with mixed integration orders and its ability to capture both short- and long-term dynamics.

Based on financial literature and BRI annual reports, the profitability function is specified as follows:

Dependent variable: Return on Assets (ROA), as a composite measure of overall profitability.

Independent variables: Capital Adequacy Ratio (CAR), Loan-to-Deposit Ratio (LDR), Operational Efficiency (BOPO), Non-Performing Loans (NPL), and Net Interest Margin (NIM). These variables are summarized in the following table.

Table 01.Model Variables

Variable	Symbol	Type	MeasurementMethod	AnalyticalExplanation
Financial profitability	ROA	Dependent	Net profit ÷ Total assets	The main indicator of financial sustainability and the bank's ability to generate profits from its resources
Capital adequacy	CAR	Independent	Eligible capital ÷ Risk-weighted assets	Represents the first line of defense; higher levels enhance confidence and allow credit expansion with lower insolvency risk.
Loan-to-deposit ratio	LDR	Independent	Total loans ÷ Total deposits	Reflects the bank's efficiency in transforming deposits and savings into income-generating productive
Operationalefficiency	BOPO	Independent	Operating expenses ÷ Operating income	Measures management efficiency in controlling costs; a lower ratio indicates higher net profit margins.
Non-performingloans	NPL	Independent	Non-performing loans ÷ Total loan portfolio	Higher default levels lead to direct losses and required provisions, reducing profitability.
Net interestmargin	NIM	Independent	Net interest income ÷ Interest-earning assets	Reflects the spread between funding costs and lending returns; it is the main driver of banking revenues.

Source : Prepared by the researchers.

Assuming a linear relationship between the model variables, the econometric model can be expressed as follows:

$$ROA_t = \beta_0 + \beta_1 \mathrm{CAR}_1 + \beta_2 \mathrm{LDR}_t + \beta_3 \mathrm{BOPO}_t + \beta_4 \mathrm{NPL}_t + + \beta_5 \mathrm{NIM}_t + \varepsilon_t$$

The selected econometric specification (Selected Model: 2, 0, 0, 2, 0) was chosen due to its strong ability to distinguish between short-run and long-run effects. It also provides the Bounds Testing approach, which is used to detect the existence of a stable long-run cointegration relationship among variables. In addition, this model is particularly suitable for small sample sizes and generates an Error Correction Term (CointEq),which captures the adjustment dynamics of profitability and the speed at which it absorbs shocks and returns to its equilibrium path.

4.2.Econometric Estimation and Statistical Diagnostic Tests

4.2.1. Time Series Stationarity Test (ADF Results): The Augmented Dickey-Fuller (ADF) test results presented in Table 2 indicate a mixed order of integration among the variables. The operational efficiency variable (BOPO) is stationary at level I(0) with a probability value of 0.0457, while the remaining variables (ROA, CAR, LDR, NIM, and NPL) become stationary only after first differencing I(1).

Given this mixed integration order (a combination of I(0) and I(1)), and to avoid the problem of spurious regression, the Autoregressive Distributed Lag (ARDL) model was adopted as the most appropriate analytical framework, since it does not require all variables to be integrated at the same order.

4.2.2. ARDL Estimation Results

4.2.2.1. Bounds Test Analysis : The results show that the computed F-statistic exceeds the upper critical bound I(1) at the 5% significance level. This leads to the rejection of the null hypothesis and the acceptance of the alternative hypothesis, confirming the existence of a long-run equilibrium (cointegration) relationship between bank profitability and its determinants (capital adequacy, liquidity, efficiency, and credit risk). This justifies the estimation of long-run coefficients.

4.2.2.2. Short-Run and Long-Run Coefficients and Error Correction Term : The Error Correction Term (CointEq) is negative and statistically significant (−0.637) with a probability value of 0.028. This indicates a strong adjustment mechanism in BRI's profitability, meaning that 63.7% of short-run deviations from equilibrium are corrected within one year, Regarding operational efficiency (BOPO), the results show a strong and significant negative effect (−0.142) at the 1% level. Economically, this confirms that strict cost control is the main driver of profitability, as a 1% increase in operating expenses leads to a 0.14% decrease in ROA, Capital adequacy (CAR) also shows a negative and significant effect (−0.072), suggesting that excessively high capital levels may act as an opportunity cost, where idle funds used to strengthen solvency are not invested in income-generating activities, thereby reducing return on assets, The liquidity ratio (LDR) exhibits a small positive coefficient (0.003), but it is statistically insignificant ($p = 0.80$). This implies that BRI's profitability is not determined by the volume of loans alone, but rather by loan quality and interest margins.

4.2.2.3. Diagnostic Tests (Model Quality) : The LM test for autocorrelation shows a probability value of 0.821, which is greater than 0.05, indicating the absence of serial correlation in the error terms. The ARCH test yields a probability value of 0.867, confirming homoscedasticity and stable error variance over time.

4.2.2.4.Model Validity and Diagnostic Evaluation : To assess the validity and robustness of the estimated model, several diagnostic tests were conducted as shown in Table 2. The Breusch-Godfrey test reports a probability value of 0.8213, which is above the 5% significance level, confirming the absence of autocorrelation. Similarly, the ARCH test confirms homoscedasticity with a probability value of 0.8670, indicating stable variance, Overall, these results confirm that the model is statistically robust, and the estimated coefficients are BLUE (Best Linear Unbiased Estimators), making them reliable for forecasting and policy implications for BRI, Finally, the CUSUM and CUSUM of Squares tests were applied to verify structural stability. The results show that the plots remain within the critical bounds at the 5% significance level, confirming the stability of the long-run relationship throughout the study period (2007–2024).

Table 02. Diagnostic Test Results of the ARDL Model

Test Type	Test Method	Probability Value (Prob)	Test Statistic Value	Result and Interpretation
Autocorrelation	Breusch-Godfrey (LM)	0.8213	F = 2.677	Greater than 0.05: the model is free from autocorrelation problems.
Heteroskedasticity	ARCH Test	0.8670	F = 0.144	Greater than 0.05: the model exhibits homoscedasticity (constant variance).
Normality	Jarque-Bera	0.5355	F = 0.535	Greater than 0.05: the residuals follow a normal distribution.

Source: Prepared by the researchers based on EViews 10 output.

3.4 Discussion of Results and Hypothesis Testing

The results of the Bounds Test for cointegration revealed a key methodological finding, as the computed F-statistic clearly exceeds the upper critical bound I(1) at the 5% significance level. Accordingly, the null hypothesis is rejected and the alternative hypothesis of a long-run equilibrium relationship is accepted. Based on this outcome, the third research hypothesis is confirmed, which assumes the existence of a long-run cointegration relationship between the independent variables and the Return on Assets (ROA).

Economically, this cointegration indicates that the determinants of safety and liquidity are dynamically and stably linked to the financial profitability of Bank Rakyat Indonesia (BRI) in the long run, while being subject to temporary market shocks. This equilibrium relationship is reinforced by the short-run adjustment mechanism captured by the Error Correction Term (CointEq), which is negative and statistically significant at (−0.637) with a probability of (0.028). This result carries important banking implications, showing that BRI possesses a strong internal resilience and exceptional shock-absorption capacity, as 63.7% of short-run deviations in profitability are corrected within one year to restore equilibrium.

Regarding the economic interpretation of the independent variables and the remaining hypotheses, the econometric estimation reveals a strong and statistically significant negative effect of the operational efficiency ratio (BOPO), with a coefficient of (−0.142) at the 1% significance level.

Similarly, the results show a negative and significant effect of the Capital Adequacy Ratio (CAR), with a value of (−0.072) at the 5% significance level. Therefore, the second hypothesis is accepted, which predicted a negative impact of capital adequacy on profitability due to opportunity costs. This finding reflects the classical trade-off between safety and profitability in banking management, where excessively high capital buffers beyond regulatory requirements act as a burden on profitability, as idle capital is not allocated to high-yield microcredit investments.
Finally, the model shows a small positive coefficient for the Loan-to-Deposit Ratio (LDR) of (0.003), but it is statistically insignificant ($p = 0.80$), indicating the neutrality of this variable. This result confirms that BRI's profitability is not driven by a mere quantitative increase in lending relative to deposits, but rather depends on the quality of the loan portfolio, the ability to reduce non-performing loans (NPL), and the generation of sufficient net interest.

5. Conclusion

At its core, this study sought to decompose and analyze the financial determinants affecting banking profitability in microfinance institutions, using the experience of Bank Rakyat Indonesia (BRI) as an empirical framework to test this relationship over the period 2007–2024. By reviewing theoretical literature and employing econometric modeling based on the Autoregressive Distributed Lag (ARDL) approach, the research traced the equilibrium dynamics governing the interaction between Return on Assets (ROA) and a set of key financial indicators.
The statistical analysis confirmed the existence of a long-run cointegration relationship among the study variables, highlighting operational efficiency as the strongest and most influential determinant of profitability. This reinforces the economic view that strict cost control constitutes the first line of defense for financial sustainability. On the other hand, the analysis revealed a critical paradox related to excessive capital buffering, showing that capital adequacy levels beyond regulatory requirements generate an opportunity cost that directly reduces potential returns. Meanwhile, the statistical neutrality of the liquidity ratio confirms that quantitative expansion in lending does not guarantee profitability unless it is accompanied by strong portfolio quality and positive interest margins.

Based on these findings, the strategic recommendations emphasize the need for banking management to deepen digital transformation in order to reduce administrative cost curves, rationalize capital buffers by releasing excess reserves for higher-yield investments, and redesign credit policies to maximize net interest margins rather than merely expanding loan volumes.
Despite the robustness and structural stability of the estimated econometric results, methodological limitations must be acknowledged. The study is limited to a single bank, which may constrain the generalizability of its findings across banking systems with different financial structures. Moreover, the model focuses exclusively on internal micro-financial variables, excluding macroeconomic factors such as inflation and economic growth, which inevitably interact with credit cycles. These limitations open new avenues for future research, particularly through panel data models covering a broader sample of microfinance banks in emerging economies, as well as the integration of modern qualitative variables such as banking governance indicators and financial technology (Fintech) innovation, in order to develop a more comprehensive framework for understanding financial sustainability determinants in the modern banking industry.

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7. Appendices

Table 3. Financial Profitability Determinants of Bank Rakyat Indonesia for the Period (2005–2024)

Year	Financial Profitability (ROA)	Non-Performing Loans (NPL)	Operational Efficiency (BOPO)	Net Interest Margin (NIM)	Loan-to-Deposit Ratio (LDR)	Capital Adequacy Ratio (CAR)
2005	0,0504	0,0468	0,7045	0,1215	0,7783	0,1522
2006	0,0436	0,0481	0,7438	0,1116	0,7253	0,1879
2007	0,0461	0,0344	0,6980	0,1086	0,6880	0,1582
2008	0,0418	0,0280	0,7265	0,1018	0,7993	0,1318
2009	0,0373	0,0352	0,7764	0,0914	0,8088	0,1320
2010	0,0464	0,0278	0,7086	0,1077	0,7517	0,1376
2011	0,0493	0,0230	0,6669	0,0958	0,7620	0,1496
2012	0,0515	0,0178	0,5993	0,0842	0,7985	0,1695
2013	0,0503	0,0155	0,6058	0,0855	0,8854	0,1699
2014	0,0473	0,0169	0,6542	0,0851	0,8168	0,1831
2015	0,0419	0,0202	0,6796	0,0813	0,8688	0,2059
2016	0,0384	0,0203	0,6893	0,0800	0,8777	0,2291
2017	0,0369	0,0210	0,6914	0,0793	0,8813	0,2296
2018	0,0368	0,0214	0,6848	0,0745	0,8957	0,2121
2019	0,0350	0,0262	0,7010	0,0698	0,8864	0,2255
2020	0,0198	0,0294	0,8122	0,0600	0,8366	0,2126
2021	0,0272	0,0308	0,7430	0,0689	0,8367	0,2725
2022	0,0376	0,0282	0,6420	0,0680	0,7917	0,2554
2023	0,0393	0,0312	0,6435	0,0681	0,8473	0,2730
2024	0,0376	0,0294	0,6764	0,0647	0,8939	0,2750

Source: Prepared by the researchers based on the statistical publications of Bank Rakyat Indonesia.

Figure 01. Jarque-Bera Test Results for the Normal Distribution of Residuals

