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The Effect of Capital Adequacy and Credit Risk on The Financial Performance of PT BPR Kerta Raharja (Perseroda) with Loan to Deposit Ratio (LDR) as A Moderation Variable A Study for The Period 2018–2025

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Abstract

Rural banks play an important role in supporting local economic activity; however, their financial performance is highly sensitive to capital adequacy, credit risk, and liquidity conditions. This study examined the effects of the Capital Adequacy Ratio (CAR) and Non-Performing Loans (NPL) on the financial performance of PT BPR Kerta Raharja (Perseroda), with the Loan to Deposit Ratio (LDR) as a moderating variable during the 2018–2025 period. A quantitative explanatory research design was employed using a saturated sampling technique involving 32 quarterly financial reports. Data were analyzed using descriptive statistics, Pearson correlation analysis, time-series diagnostics, hierarchical regression, and Moderated Regression Analysis with Newey–West heteroskedasticity and autocorrelation-consistent (HAC) standard errors. The results showed that the full model was jointly significant and explained 58.83% of the variation in Return on Assets (ROA). CAR had a positive but statistically insignificant effect, while NPL had a negative but statistically insignificant effect at the mean LDR level. LDR had a significant negative direct effect on ROA. The CAR×LDR interaction was insignificant, indicating that LDR did not moderate the relationship between CAR and ROA, whereas the NPL×LDR interaction was positive and significant, confirming that LDR moderated the relationship between credit risk and ROA. The study concluded that liquidity conditions played a more influential role in shaping the effect of credit risk on bank profitability than capital adequacy. Therefore, integrated credit quality and liquidity management are essential for maintaining sustainable financial performance.

INTRODUCTION

Banking occupies a strategic position in the economy because it performs an intermediation function by collecting funds from the public and channeling them back as credit to households and business sectors. Through this mechanism, banks connect parties with surplus funds to those requiring financing, thereby supporting production, investment, consumption, and employment creation. This role is increasingly important for micro, small, and medium enterprises, which often face limited access to formal financing. However, the intermediation function also involves risks because disbursed funds are not always repaid according to the agreed terms and schedules. Consequently, a bank's business continuity is determined not only by credit growth but also by its ability to maintain capital adequacy, asset quality, liquidity, efficiency, and profitability. Cross-country research shows that inclusive

banking requires adequate regulatory support and strong institutional performance, while local banks remain important due to their proximity to small-business borrowers and their ability to process information that may not be fully reflected in formal documentation (De Sousa, 2015; Jungo et al., 2024; Ofoeda, Amoah, et al., 2024; Ofoeda, Mawutor, et al., 2024; Saha & Dutta, 2024).

Within regional economic structures, local banks function not only as credit providers but also as institutions that strengthen community economic resilience. Geographic proximity and long-term customer relationships allow local banks to understand business characteristics, cash flows, and repayment capacities more deeply, which is particularly relevant for small businesses with incomplete financial statements or limited collateral. During economic shocks, this ability to sustain credit distribution can help businesses survive and reduce the contractionary effects on regional economic activity. Nevertheless, portfolio concentration in certain regions and segments may increase vulnerability; therefore, regional banks must balance expanding financing access with effective risk management practices, as informational advantages and customer proximity do not eliminate the possibility of non-performing loans (Aden, 2017; Adusei & Adeleye, 2022; Algeri et al., 2023; Campanella et al., 2020; Taujanskaite et al., 2016).

The banking environment is also changing rapidly due to digitalization, increasing customer expectations, and efficiency pressures. Digital transformation can expand service accessibility and improve customer experiences; however, these benefits do not occur automatically because technology investments that are not supported by process integration may instead increase costs and reduce efficiency. For Rural Banks (BPR), this challenge is more complex due to their limited scale and resources compared with commercial banks. Therefore, improving performance requires disciplined asset management and cost control. This complexity became particularly evident during the COVID-19 pandemic, when declining household income increased default risks while banks were required to maintain liquidity and support economic recovery through restructuring programs. Banks with stronger capital positions and better asset quality had greater capacity to absorb losses, whereas banks experiencing high NPL levels before the pandemic were more vulnerable to declining profitability. These conditions confirmed that credit expansion must be evaluated together with capital capacity and credit quality. More broadly, bank stability is determined by interactions among macroeconomic conditions, funding structures, and internal risk-management practices, indicating that relationships among financial ratios are not mechanical and may change according to economic circumstances.

In Indonesia, Bank Perekonomian Rakyat (formerly Bank Perkreditan Rakyat, or Rural Bank) plays an important role in providing financial services to small-scale businesses. The nomenclature change was established through Law Number 4 of 2023 concerning the Development and Strengthening of the Financial Sector, as amended by Law Number 4 of 2026, and implemented through OJK Regulation Number 7 of 2024. These regulatory developments strengthened the developmental orientation of BPRs while maintaining the requirement to apply prudential banking principles. Because BPR asset structures are predominantly composed of credit portfolios, financing quality becomes a key determinant of profitability. Furthermore, their limited scale and diversification increase sensitivity to local

economic changes. Recent research on BPRs in Gianyar Regency has shown that CAR, NPL, and LDR have empirical relationships with ROA that require simultaneous analysis.

The role of BPRs becomes particularly strategic when the institution is owned by a regional government and structured as a Regional Government-Owned Corporation (Perseroda), which must balance commercial objectives, such as profitability, customer trust, capital adequacy, and business continuity, with developmental objectives, including expanding financing access, supporting MSMEs, and contributing to regional revenue. This dual objective requires credit policies that are both productive and prudent because overly conservative expansion may reduce the developmental role, while excessively aggressive lending may increase non-performing loans and place pressure on capital. The literature confirms that smaller financial institutions often possess relational advantages in serving small enterprises; however, these advantages require effective risk-control systems to ensure that developmental missions do not undermine asset quality and profitability.

PT BPR Kerta Raharja (Perseroda) is a rural bank owned by the Regional Government of Bandung Regency and headquartered on Jalan Raya Soreang Number 26, Bandung Regency. The bank performs an intermediation function that supports community welfare, regional economic growth, and regional own-source revenue through savings and credit products designed to support local financing needs. Financial performance is measured using Return on Assets (ROA), which reflects management effectiveness in generating profits from productive assets and is commonly used as a key indicator in banking profitability studies. However, ROA should be analyzed together with capital adequacy, credit quality, liquidity, and efficiency indicators to avoid partial interpretations, as research in the Indonesian banking sector shows that CAR, NPL, LDR, and efficiency ratios may have different directions and levels of significance in influencing ROA depending on the sample characteristics and research period.

Table 1. Financial Ratios and Performance of PT BPR Kerta Raharja (Perseroda), 2018–2025

Year	CAR/KPMM	NPL Gross	NPL Net	ROA	BOPO	Total Credit (IDR)	Profit Before Tax (IDR)
2018	28.40%	9.48%	4.32%	2.49%	88.15%	196,373,448,192	7,020,735,610
2019	23.58%	6.67%	2.34%	2.47%	87.38%	243,718,720,977	7,815,440,864
2020	23.31%	7.64%	2.94%	1.48%	89.45%	251,591,669,951	5,043,220,963
2021	19.70%	5.69%	1.44%	1.66%	90.46%	304,464,779,623	5,930,300,770
2022	17.13%	4.77%	1.74%	1.90%	88.05%	402,070,551,640	8,840,224,576
2023	18.95%	9.76%	4.98%	1.20%	91.82%	422,335,355,041	6,782,002,781
2024	18.76%	10.60%	4.20%	1.16%	92.18%	469,103,589,357	6,472,614,013
2025	20.62%	15.44%	5.68%	1.32%	92.61%	466,870,550,130	7,386,139,892

Source: PT BPR Kerta Raharja (Perseroda), annual publication reports

Table 1 shows that during the pre-pandemic period (2018–2019), ROA and profit before tax remained relatively stable, while gross and net NPL declined. Meanwhile, CAR decreased from 28.40% to 23.58%, indicating that changes in CAR should be interpreted together with credit quality, asset utilization, and operating efficiency. Performance experienced pressure in 2020, with ROA declining to 1.48% and BOPO increasing to 89.45%, followed by gradual recovery during 2021–2022, when ROA increased to 1.90% and NPL declined to 4.77%. This

recovery occurred alongside a further decline in CAR to 17.13%, a pattern that may indicate that growth in risk-weighted assets exceeded capital growth as lending activities expanded. The most significant pressure emerged during 2023–2025, when gross NPL increased from 4.77% to 15.44%, ROA declined to approximately 1.2% before slightly improving to 1.32% in 2025, and BOPO increased to 92.61%. Meanwhile, total credit growth stagnated in 2025 as non-performing loan balances increased. This pattern indicates that credit portfolio expansion was not fully supported by adequate asset quality and operational efficiency.

Capital adequacy is proxied by the Capital Adequacy Ratio (CAR), which represents the ratio of capital to risk-weighted assets and functions as a loss-absorption buffer while supporting compliance with prudential requirements. Adequate capital enhances resilience against asset-quality deterioration and supports credit expansion; however, the relationship between capital adequacy and profitability is not always positive. At PT BPR Kerta Raharja (Perseroda), CAR increased from 17.13% in 2022 to 20.62% in 2025, while ROA declined from 1.90% to 1.32%. This suggests that stronger capital positions do not automatically improve financial performance when accompanied by increasing credit risk and operational inefficiency. Credit risk is measured using gross Non-Performing Loans (NPL), which represent non-performing loans before provisioning. An increase in NPL reduces productive assets, decreases interest income, and increases provisioning requirements, although its impact on ROA may occur with a time lag due to loan restructuring and write-off policies. Meanwhile, Loan to Deposit Ratio (LDR) reflects intermediation intensity and liquidity conditions. A low LDR may indicate underutilized funds, whereas an excessively high LDR may reduce liquidity flexibility. Therefore, LDR is relevant not only as a direct determinant of ROA but also as a variable that may influence the relationship between other financial factors and performance.

In the relationship between capital adequacy and financial performance, LDR may function as a moderating variable. When LDR is maintained at an appropriate level and credit is distributed to quality borrowers, sufficient capital can support productive asset expansion, allowing LDR to potentially strengthen the positive effect of CAR on ROA. Conversely, a low LDR may indicate that available capital has not been optimally converted into productive assets, while an excessively high LDR may reduce the benefits of capital adequacy due to increased liquidity pressure and credit-risk exposure. Similarly, LDR may moderate the effect of credit risk on financial performance. When a large proportion of third-party funds is allocated to lending activities, an increase in NPL may disrupt cash inflows while the bank continues to meet depositor obligations, thereby potentially strengthening the negative impact of credit risk on profitability. However, under more controlled LDR conditions, banks may have greater liquidity capacity to absorb delayed repayments. Therefore, the moderating role of LDR may either strengthen or weaken these relationships, and its direction requires empirical testing.

Table 2. Previous Research and Relevance to This Study

Author (Year)	Object and Method	Key Finding
Berger & DeYoung (1997)	Commercial banks; problem loans and cost efficiency	Supports the bad management hypothesis: inefficiency can precede a rise in non-performing loans, which then adds cost
Mendoza & Rivera (2017)	567 rural banks in the Philippines; panel regression	Credit risk reduces profitability, while capital adequacy is not significant
Abbas et al. (2019)	US and Asian banks, post-crisis; panel data	Capital and liquidity positively affect profitability, while credit risk has a negative effect
Anggawulan & Suardikha (2021)	39 banks on the Indonesia Stock Exchange; MRA	CAR, LDR, NPL, and firm size do not affect ROA; NPL does not moderate the CAR–LDR relationship with ROA
Widyastuti & Aini (2021)	Indonesian banks, 2017–2019; regression	NPL negatively affects ROA, while CAR and LDR are not significant
Sastrawan et al. (2023)	Public banks, 2019–2021; MRA	NPL is negative and CAR positive on ROA; LDR does not moderate either NPL or CAR
Ardiantini & Susila (2025)	Rural banks in Gianyar Regency; CAR, NPL, LDR, and ROA	CAR, NPL, and LDR jointly affect ROA, with partial results not fully uniform
Al Zafir & Sudarjah (2025)	Indonesian conventional banks, 2015–2023; quarterly dynamic panel	NPL negatively affects ROA; CAR and LDR positively affect ROA; the pandemic changed the NPL–ROA relationship

Source: Researcher's design, adapted from the reviewed literature (2026)

Prior studies have identified three broad patterns. First, capital adequacy generally supports financial resilience and profitability; however, its effect may become insignificant or vary depending on liquidity conditions and risk exposure. Second, Non-Performing Loans (NPL) more consistently demonstrate a negative effect on financial performance, although the magnitude of this effect may be influenced by provisioning policies and macroeconomic conditions. Third, findings regarding Loan to Deposit Ratio (LDR) and its moderating role remain mixed. The main research gaps are evident in terms of research objects, dependent constructs, and analytical models. Previous studies have generally focused on commercial banks or groups of Rural Banks (BPRs), measured financial performance primarily using ROA, and treated LDR as an independent variable. This study differs by examining a single regional-government-owned BPR and testing LDR as a moderating variable in two relationships simultaneously over the 2018–2025 period, which covers pre-pandemic, pandemic, recovery, and renewed credit-risk phases.

This study provides novelty through the selection of PT BPR Kerta Raharja (Perseroda) as a regionally government-owned BPR, the use of the 2018–2025 observation period encompassing pre-pandemic, pandemic, recovery, and normalization phases, and the positioning of LDR as a moderating variable within an integrated framework involving capital adequacy, credit risk, intermediation, and profitability. Practically, the findings are expected to assist management and regional government shareholders in evaluating capital policies, credit strategies, NPL control, and liquidity targets. Theoretically, this study contributes empirical evidence regarding the conditions under which capital adequacy becomes more productive and credit risk becomes more detrimental to BPR performance. Based on the observed phenomenon

of increasing CAR without corresponding improvements in ROA, accompanied by rising NPL and BOPO, this study is entitled The Effect of Capital Adequacy and Credit Risk on the Financial Performance of PT BPR Kerta Raharja (Perseroda) with LDR as a Moderating Variable: A Study for 2018–2025.

Based on this background, the research questions are formulated as follows: (1) what are the conditions of capital adequacy, credit risk, LDR, and financial performance of PT BPR Kerta Raharja (Perseroda) during 2018–2025; (2) does capital adequacy affect financial performance; (3) does credit risk affect financial performance; (4) does LDR affect financial performance; (5) does LDR moderate the effect of capital adequacy on financial performance; and (6) does LDR moderate the effect of credit risk on financial performance. Theoretically, this study contributes to the financial management and banking literature by examining the relationship between capital adequacy, credit risk, intermediation, liquidity, and bank financial performance through a contingency perspective. Practically, the findings are expected to assist management in evaluating capital productivity, NPL control, credit–deposit balance, liquidity management, and operational efficiency. In addition, the results may support the Bandung Regency Government as a shareholder in evaluating capital injection policies, credit growth targets, and corporate governance practices for a regional institution that carries both commercial and developmental functions.

This study is based on financial intermediation theory as the foundation for understanding the economic role of banks, capital-buffer and risk–return trade-off theories as the basis for explaining capital adequacy, credit-risk-management theory and the bad management hypothesis as explanations for NPL formation, and contingency theory to explain how these relationships may vary depending on banking conditions. Diamond (1984) explains that financial intermediaries reduce monitoring costs through delegated monitoring on behalf of depositors while transforming the amount, maturity, liquidity, and risk characteristics of funds. Capital-buffer theory views capital as the first layer of protection against losses before they affect depositors; therefore, the relationship between capital and performance reflects a trade-off between resilience and productivity. Berger and DeYoung's (1997) bad management hypothesis proposes that managerial inefficiency may precede increases in non-performing loans, which subsequently increase collection and provisioning costs. Meanwhile, contingency theory suggests that the effectiveness of a policy depends on its alignment with organizational conditions, providing the theoretical basis for positioning LDR as a moderating variable. Strong capital is expected to generate greater benefits when effectively allocated to productive assets under controlled liquidity conditions, whereas the negative impact of NPL is expected to become more pronounced when a larger proportion of funds is allocated to credit activities.

In this study, financial health refers to a bank's ability to generate sustainable income, control operational costs, maintain asset quality, fulfill obligations, and provide sufficient capital to absorb potential losses. This concept is broader than profitability alone. To avoid overlap between explanatory and dependent variables, the dependent construct is focused on profitability and efficiency rather than being directly constructed from CAR, NPL, and LDR. Conceptually, the study proposes a Financial Health Index (FHI) derived from standardized ROA and reverse-standardized BOPO values ($IKKt = (ZROAt - ZBOPOt) / 2$), complemented by a short-term liquidity indicator (Cash Ratio) through min–max normalization. However, because the available quarterly data are primarily centered on ROA, the interpretation of

financial health in the empirical analysis is limited to asset profitability rather than a comprehensive composite index or the official OJK rating system. The proposed index therefore functions as an academic measurement approach and does not replace the official financial health assessment framework established by OJK.

Based on the theoretical synthesis above, the conceptual model positions financial performance as the outcome of a bank's ability to transform capital and public funds into productive assets while maintaining controlled risk and operational costs. Capital adequacy provides loss-absorption capacity, credit risk represents asset-quality conditions, and LDR reflects intermediation intensity while determining how effectively capital is utilized and how strongly NPL affects cash flow and liquidity conditions. Based on this framework, five hypotheses are proposed: H1, capital adequacy has a positive effect on financial performance; H2, credit risk has a negative effect on financial performance; H3, LDR has a positive effect on financial performance within a prudent intermediation range; H4, LDR strengthens the positive effect of capital adequacy on financial performance; and H5, LDR strengthens the negative effect of credit risk on financial performance.

METHOD

This study employed a quantitative approach because all research variables were measured using numerical data in the form of financial ratios and analyzed through statistical techniques. The quantitative approach was selected to objectively examine the relationships among variables, consistent with the objective of testing the effects of capital adequacy and credit risk on financial performance and the moderating role of LDR at PT BPR Kerta Raharja (Perseroda). Based on its objective, this study applied an explanatory research design with an associative approach to examine the statistical relationships among independent, dependent, and moderating variables based on the developed theoretical framework and hypotheses. The study examined whether changes in capital adequacy and credit risk were associated with changes in financial performance and whether LDR altered the strength or direction of these relationships.

Although the study used the term "effect," the research design was non-experimental, as no variables were manipulated and the analysis was based on historical financial data recorded in the company's financial reports. Therefore, the findings were interpreted as statistical evidence within the observed object and period rather than as absolute causal relationships as established through experimental research. The study employed a time-series design, with PT BPR Kerta Raharja (Perseroda) as the unit of analysis and quarterly financial reports from 2018 to 2025 as the unit of observation. This period was selected because it covered various economic conditions, including the pre-pandemic period, pandemic period, restructuring phase, recovery phase, and normalization period, which could influence credit quality, intermediation, liquidity, and capital adequacy. Quarterly data were used to obtain 32 observations, providing a more appropriate basis for estimating the proposed model compared with annual data.

The research applied a deductive approach, beginning with financial intermediation theory, capital-buffer theory, credit-risk theory, and liquidity theory to develop the conceptual framework explaining the relationships among variables. Based on these theories and previous empirical studies, hypotheses were formulated and tested using financial data from PT BPR

Kerta Raharja (Perseroda). The research process consisted of several stages: identifying the research problem, reviewing relevant literature, developing the conceptual framework, formulating hypotheses, determining variables and indicators, collecting and verifying financial reports, tabulating data, conducting statistical analysis, interpreting the results, and formulating conclusions and recommendations.

Variables and Operational Definitions

The study uses independent, dependent, moderating, and interaction variables. The independent variables are capital adequacy (X1), indicating a bank's capital capacity to bear risk, and credit risk (X2), indicating potential loss from debtor default. The dependent variable is financial health (Y), operationalized through ROA in the empirical estimation, consistent with the data available for quarterly analysis. The moderating variable is LDR (Z), which has two roles: a main variable potentially directly related to financial health, and a moderator interacting with capital adequacy and credit risk. Two interaction terms, X1Z (CAR×LDR) and X2Z (NPL×LDR), test whether the independent variables' effects change at different moderator levels. Prior to forming the interactions, CAR, NPL, and LDR were mean-centered; centering does not change overall model fit or the interaction coefficient but reduces non-essential multicollinearity and makes the main-effect coefficients interpretable at the moderator's mean level.

Table 3. Operationalization of Research Variables

Variable	Operational Definition	Indicator	Formula	Scale
Capital Adequacy (X1)	A bank's ability to provide capital to bear risk from assets and operations	CAR / KPMM	Qualifying capital ÷ risk-weighted assets × 100%	Ratio
Credit Risk (X2)	Potential loss from non-performing loans	Gross NPL	Non-performing loans ÷ total credit × 100%	Ratio
LDR (Z)	Level of third-party funds channeled as credit	LDR	Total credit ÷ third-party funds × 100%	Ratio
Financial Health (Y)	Profitability, efficiency, and short-term liquidity condition of the bank	ROA (empirical proxy); FHI (conceptual index)	Profit before tax ÷ average total assets × 100%	Ratio / Index

Source: Researcher's design (2026)

Population, Sample, and Data Collection

The population comprises all periodic financial reports of PT BPR Kerta Raharja (Perseroda) for 2018–2025 containing information to compute CAR/KPMM, gross NPL, LDR, ROA, BOPO, and the Cash Ratio, yielding 8 years × 4 quarters = 32 observations. A saturated-sampling (census) technique was used, taking all quarterly reports meeting criteria of completeness, consistency, comparability, and verifiability, since periods are limited and every observation is relevant, also reducing selection bias. The study uses secondary quantitative data from quarterly and audited financial reports and lawfully obtained internal documents, supported by OJK and Bank Indonesia publications, regional-government documents, and scientific literature, collected through documentation, library research, document review (to check consistency of definitions and identify accounting-policy changes), and supporting interviews with company officials where needed. Because the study does not use a

questionnaire, construct-validity and Cronbach's Alpha tests were not performed; data quality was instead assessed through document verification — confirming the official source, cross-checking quarterly against annual and audit figures, recomputing ratios, and checking for input errors and extreme values.

Data Analysis Technique

Analysis was conducted using statistical software capable of estimating regressions with interaction terms and analyzing time-series data (such as EViews, Stata, R, or SPSS). Initial processing included ordering the data by quarter, coding the variables (X1 = CAR/KPMM, X2 = gross NPL, Z = LDR, Y = ROA/FHI, X1Z = CAR×LDR interaction, X2Z = NPL×LDR interaction), unit standardization, missing-data and input-error checks, and construction of the centered and interaction variables. Descriptive statistics (observations, minimum, maximum, mean, median, standard deviation, skewness, and kurtosis) were computed for each variable, followed by a trend analysis of CAR/KPMM, NPL, LDR, and ROA across all 32 quarters to identify direction of change, volatility, extreme periods, pandemic-related shifts, recovery patterns, and possible structural breaks, without interpreting similarity of graphical patterns as evidence of causation.

Stationarity of each variable was tested using the Augmented Dickey-Fuller (ADF) test at the level and, where necessary, the first difference; given the limited number of observations (32), unit-root results were interpreted cautiously due to the test's relatively limited power. Structural stability was checked using CUSUM, CUSUM of Squares, or a pandemic dummy as a robustness check. Model assumptions were tested through residual normality (Jarque-Bera), multicollinearity (VIF, with values below 10 and tolerance above 0.10 indicating no serious multicollinearity; main-effect variables were retained despite correlation with interaction terms per the hierarchical-model principle), heteroscedasticity (Breusch-Pagan-Godfrey), autocorrelation (Breusch-Godfrey LM, complemented by Durbin-Watson, with Newey-West HAC standard errors applied when indicated), and model specification (Ramsey RESET). Influential observations were examined using studentized residuals, leverage, and Cook's Distance; extreme values were retained and examined through sensitivity analysis unless clearly attributable to input error.

Pearson correlation described the direction and strength of linear relationships among variables, though not used as the basis for hypothesis testing since it does not control for other variables or establish causality. Multiple linear regression was estimated hierarchically: Model 1 tested CAR and NPL on ROA; Model 2 added the LDR main effect; and Model 3, the full MRA specification, added the CAR×LDR and NPL×LDR interaction terms, with the hierarchical principle applied by retaining X1, X2, and Z when interactions were added, and moderation considered supported only when the interaction coefficient itself was significant, not merely when LDR's direct effect was significant. Hypotheses were tested through partial t-tests (5% level, with directional hypotheses also requiring the coefficient sign to match), a simultaneous F-test, and R-squared / Adjusted R-squared, with ΔR^2 computed as the moderation model's R^2 minus the previous model's R^2; an R-squared increase alone is not sufficient to conclude moderation — the interaction coefficient remains the primary criterion.

RESULT AND DISCUSSION

Overview of the Research Object

PT BPR Kerta Raharja (Perseroda) is used as the single unit of analysis. The company is licensed and supervised by the Financial Services Authority (OJK) and Bank Indonesia and participates in the Deposit Insurance Corporation (LPS) guarantee program, so the interpretation of its ratios must be placed within a prudential BPR framework rather than treated solely as a commercial-performance measure. The research period spans the first quarter of 2018 through the fourth quarter of 2025, covering the pre-pandemic phase, the pandemic-pressure period, recovery, and post-pandemic intermediation expansion. The quarterly frequency yields 32 sequential observations, compiled from the company's published reports; BPR publication obligations cover the KPMM, NPL, ROA, BOPO, Cash Ratio, and LDR ratios in accordance with OJK Circular Letter 39/SEOJK.03/2017.

Capital adequacy is proxied by CAR/KPMM, credit risk by gross NPL, LDR is used as the moderating variable, and financial health is operationalized with ROA. Because the dependent variable available for estimation is ROA, the term “financial health” in this results section should be read narrowly as asset profit-generating ability rather than the composite BPR health rating; the official assessment of BPR health under OJK Regulation Number 3/POJK.03/2022 and OJK Circular Letter Number 11/SEOJK.03/2022 covers a broader scope than a single profitability ratio. Before forming the interaction terms, CAR, NPL, and LDR were mean-centered; centering does not change model fit or the interaction coefficient but makes the main-effect coefficients interpretable as the effect when the moderator is at its sample mean and reduces non-essential multicollinearity. The main model was estimated hierarchically: Model 1 contains CAR and NPL; Model 2 adds LDR; Model 3 adds CAR×LDR and NPL×LDR.

Descriptive Statistics

Descriptive statistics were computed to characterize each variable used in the model prior to further testing, comprising the number of observations, minimum, maximum, mean, median, standard deviation, skewness, and kurtosis. The results are presented in Table 4.

Table 4. Descriptive Statistics (N = 32 Quarterly Observations)

Variable	N	Min.	Max.	Mean	Median	SD	Skewness	Kurtosis
CAR/KPMM	32	14.07%	28.40%	21.79%	23.08%	3.51%	−0.323	−0.575
Gross NPL	32	4.11%	16.17%	8.75%	8.66%	3.15%	0.721	0.411
LDR	32	71.07%	161.29%	98.87%	83.56%	28.47%	1.048	−0.487
ROA	32	0.58%	2.89%	1.84%	1.87%	0.59%	−0.284	−0.662

Source: Research data, processed

Average CAR/KPMM was 21.79% (SD 3.51%), with a mean lower than the median suggesting several low-CAR observations late in the period pulling the average down; a lower CAR does not automatically mean inadequate capital but reflects a reduced buffer relative to risk-weighted assets. Gross NPL averaged 8.75%, with a positive skewness (0.721) reflecting a right-hand tail driven mainly by the 2024–2025 increase, a pattern that matters because deteriorating credit quality can raise provisioning cost and reduce ROA. LDR showed the widest variation (71.07%–161.29%, mean 98.87%); a maximum above 100% indicates credit disbursed in some quarters exceeded third-party funds — not automatically negative without

considering other funding sources and liquid assets, but signaling liquidity/intermediation pressure. ROA averaged 1.84%, with its minimum occurring when both LDR and NPL were elevated, a time-coincidence this descriptive analysis only notes, with the net relationship assessed through regression.

The quarterly trend of CAR, NPL, LDR, and ROA can be grouped into three broad phases. The first phase, 2018–2022, saw CAR at relatively high levels and NPL on a declining trend, while ROA stayed comparatively stable apart from a weakening in 2020–2021 associated with pandemic-related economic pressure. The second phase, in 2023, shows a clearer pattern change: CAR declined, NPL began rising particularly in the second half of the year, and LDR jumped sharply, indicating intensified credit disbursement occurring alongside weakening capital adequacy and rising credit risk. The third phase, 2024–2025, shows LDR remaining very high and NPL rising sharply, while ROA stayed below most of the profitability levels recorded early in the observation period. This co-movement suggests that changes in LDR potentially affect the strength or direction of the CAR–ROA and NPL–ROA relationships, providing descriptive support for testing LDR as a moderating variable, although the graphical pattern alone requires confirmation through inferential statistical testing.

Correlation Analysis

Pearson correlation was used to identify the direction and strength of linear association among CAR, NPL, LDR, and ROA and to detect early indications of multicollinearity among the independent variables. The results are presented in Table 5.

Table 5. Pearson Correlation Matrix

Variable	CAR	NPL	LDR	ROA
CAR	1.000	−0.292	−0.632	0.674
NPL	−0.292	1.000	0.692	−0.354
LDR	−0.632	0.692	1.000	−0.628
ROA	0.674	−0.354	−0.628	1.000

Source: Research data, processed

CAR is fairly strongly positively correlated with ROA (r = 0.674), while LDR is fairly strongly negatively correlated with ROA (r = −0.628); the NPL–ROA correlation is negative but weaker (r = −0.354). LDR is also negatively correlated with CAR and positively correlated with NPL. These bivariate correlations indicate direction but do not isolate the effect of other variables, do not capture interaction effects, and do not establish causality.

Time-Series Properties and Model Diagnostics

Before regression estimation, the time-series properties of each variable and the fulfillment of model assumptions were examined to ensure that the data and model meet the statistical requirements for valid interpretation. Stationarity was tested using the Augmented Dickey-Fuller (ADF) test without trend; the results are presented in Table 6.

Table 6. Unit Root (ADF) Test Results, No Trend

Variable	ADF (Level)	Conclusion (Level)	ADF (1st Difference)	Conclusion (Δ)
CAR	−1.935	Fails to reject unit root	−7.205	Stationary
NPL	0.010	Fails to reject unit root	−4.259	Stationary
LDR	−0.879	Fails to reject unit root	−4.836	Stationary
ROA	−1.768	Fails to reject unit root	−5.917	Stationary

Source: Research data, processed

At the level, none of the ADF statistics exceed the 5% critical value, while all first differences show substantially more negative statistics, suggesting the variables are likely integrated of order one. Because the level specification is needed for the economic interpretation of moderation and the sample contains only 32 observations, level estimation is retained as the main model, with inference strengthened using Newey-West HAC covariances; the level findings should not be read as an already-proven, cointegrated long-run relationship.

Residual and specification diagnostics were then examined, summarized in Table 7.

Table 7. Model Diagnostic Test Summary

Aspect	Test	Statistic	Prob.	Decision
Residual normality	Jarque–Bera	0.914	0.6331	Fails to reject normality
Heteroscedasticity	Breusch–Pagan LM	2.673	0.7503	Not detected
Autocorrelation	Breusch–Godfrey LM(4)	8.097	0.0881	Not significant at 5%; weak indication at 10%
Specification	Ramsey RESET F	1.868	0.1838	No misspecification detected

Source: Research data, processed

Residuals show no departure from normality ($p = 0.6331$) and the Breusch-Pagan test finds no heteroscedasticity ($p = 0.7503$). The four-lag Breusch-Godfrey test yields $p = 0.0881$, not significant at 5% but close to the 10% threshold, and the main model's Durbin-Watson statistic of 1.126 also signals possible positive serial correlation; coefficient decisions are therefore based on Newey-West HAC standard errors.

Multicollinearity was assessed using the Variance Inflation Factor (VIF), reported in Table 8.

Table 8. Variance Inflation Factor

Variable	VIF
CAR_C	4.731
NPL_C	3.416
LDR_C	8.269
CAR_C × LDR_C	6.526
NPL_C × LDR_C	3.123

Source: Research data, processed

All VIF values are below 10, with the highest at LDR_C (8.269) and the CAR_C×LDR_C interaction (6.526); these values warrant attention but do not indicate severe multicollinearity, and all main effects were retained to satisfy the model's hierarchical

principle. The maximum Cook's Distance was 0.372, at 2023-Q2, exceeding the simple 4/N = 0.125 rule of thumb but remaining below 1; this observation was not removed, as it represents an actual company condition, so the results should be understood as sensitive to the structural shift after 2023.

Hierarchical Regression and Moderated Regression Analysis

Hierarchical regression and Moderated Regression Analysis (MRA) were used to test the effect of CAR and NPL on ROA and to assess LDR's moderating role. Estimation proceeded in stages so that changes in the model's explanatory power could be observed as the main variables, the moderator, and the interaction terms were successively added. Table 9 presents the hierarchical regression results using OLS standard errors.

Table 9. Hierarchical Regression Results (OLS Standard Errors)

Variable / Statistic	Model 1	Model 2	Model 3
Constant	0.0184 (0.0008)	0.0184 (0.0008)	0.0167 (0.0019)
CAR_C	0.1049 (0.0235)	0.0765 (0.0293)	0.0716 (0.0460)
NPL_C	−0.0321 (0.0262)	0.0052 (0.0351)	−0.0248 (0.0436)
LDR_C	—	−0.0074 (0.0048)	−0.0134 (0.0075)
CAR_C × LDR_C	—	—	−0.0307 (0.2653)
NPL_C × LDR_C	—	—	0.2475 (0.1216)
R^2	0.4816	0.5226	0.5883
Adjusted R^2	0.4458	0.4714	0.5092
F-statistic	13.4690	10.2155	7.4318
Prob. F	< 0.001	< 0.001	< 0.001

Source: Research data, processed. Standard errors in parentheses.

Model 1 is jointly significant (F = 13.469; p < 0.001) and explains 48.16% of ROA variation, with CAR positive and significant and NPL not significant. Adding LDR raises R^2 by 4.10 percentage points, a change that is not itself significant (F-change = 2.404; p = 0.1322). Model 3 raises R^2 from 52.26% to 58.83%; the two added interaction terms together raise R^2 by 6.58 percentage points, and the joint change test is not significant at 5% (p = 0.1456), even though the individual HAC test for one interaction term is significant — a difference that can occur because the joint test evaluates both interactions together while the CAR×LDR term contributes almost no additional information on its own.

Based on the Model 3 coefficients, the estimated equation in ratio units is: ROA = 0.016706 + 0.071582 CAR_C − 0.024800 NPL_C − 0.013447 LDR_C − 0.030736 (CAR_C×LDR_C) + 0.247490 (NPL_C×LDR_C). The constant of 0.016706 implies a predicted ROA of about 1.671% when CAR, NPL, and LDR are at the sample mean; because interaction terms are present, the CAR and NPL coefficients are not effects that hold across all LDR levels but conditional effects evaluated exactly at the mean LDR.

Given the diagnostic results, the main estimation in this study uses Heteroscedasticity and Autocorrelation Consistent (HAC) Newey-West standard errors, with a four-quarter bandwidth. This correction leaves the OLS coefficients unchanged but adjusts the standard errors, t-statistics, confidence intervals, and significance probabilities, making hypothesis testing more reliable against violations of homoscedasticity and no-autocorrelation. Table 10 presents the HAC coefficients for the full moderation model.

Table 10. Moderation Model Coefficients with Newey–West HAC Standard Errors

Variable	Coefficient	SE-HAC	t	Prob.	Decision (5%)
Constant	0.016706	0.001800	9.282	< 0.001	Significant
CAR_C	0.071582	0.045621	1.569	0.1287	Not significant
NPL_C	−0.024800	0.038939	−0.637	0.5298	Not significant
LDR_C	−0.013447	0.006517	−2.063	0.0492	Significant
CAR_C × LDR_C	−0.030736	0.222765	−0.138	0.8913	Not significant
NPL_C × LDR_C	0.247490	0.095697	2.586	0.0157	Significant

Source: Research data, processed; bandwidth of 4 quarters.

At mean LDR, CAR has a positive coefficient of 0.071582 but is not significant (p = 0.1287), and NPL is likewise not significant (p = 0.5298). The LDR main effect is negative and just significant at 5% (p = 0.0492), meaning that at mean CAR and NPL, a rise in LDR is associated with a decline in ROA. The CAR×LDR interaction is not significant (p = 0.8913), while the NPL×LDR interaction is positive and significant (p = 0.0157).

Conditional Effect Analysis

Conditional-effect (simple-slopes) analysis was used to interpret the significant NPL×LDR interaction by computing the conditional effect of CAR and NPL on ROA at three LDR levels — one standard deviation below the mean, at the mean, and one standard deviation above the mean — with results shown in Table 11.

Table 11. Simple Slopes at Three LDR Levels

LDR Level	Relationship	Slope	SE-HAC	t	Prob.
Low (−1 SD)	CAR → ROA	0.080332	0.029292	2.742	0.0109
Low (−1 SD)	NPL → ROA	−0.095254	0.054013	−1.764	0.0896
Mean	CAR → ROA	0.071582	0.045621	1.569	0.1287
Mean	NPL → ROA	−0.024800	0.038939	−0.637	0.5298
High (+1 SD)	CAR → ROA	0.062833	0.106525	0.590	0.5604
High (+1 SD)	NPL → ROA	0.045655	0.039992	1.142	0.2640

Source: Research data, processed

At low LDR, the CAR–ROA slope is positive and significant (p = 0.0109); at mean and high LDR it is not. However, because the CAR×LDR interaction coefficient itself is not significant, this differing pattern cannot be treated as evidence that the slopes differ, and the formal conclusion remains that LDR does not moderate the CAR–ROA relationship. For NPL, the slope shifts from negative at low LDR to near zero at the mean and positive at high LDR; none of the three simple slopes is significant at 5%, yet the significant interaction coefficient shows the slope shifts across LDR levels in a statistically meaningful way. Economically, a positive slope at high LDR does not mean higher NPL improves bank health; it is more accurately read as a change in the marginal NPL–ROA association as intermediation pressure increases, potentially influenced by credit repricing, portfolio composition, or a regime shift after 2023 mechanisms that cannot be confirmed from four ratios alone.

Hypothesis Testing

Hypothesis decisions are based on the coefficient direction and significance from the HAC-based full moderation model. A hypothesis is supported when its probability is below 0.05 and the coefficient direction matches the hypothesized relationship. Table 12 summarizes the results.

Table 12. Hypothesis Testing Summary

Hypothesis	Statement	HAC Evidence	Decision
H1	Capital adequacy has a positive effect on financial health	β CAR = 0.071582; p = 0.1287	Not supported
H2	Credit risk has a negative effect on financial health	β NPL = −0.024800; p = 0.5298	Not supported
H3	LDR has a positive effect on financial health (prudent range)	β LDR = −0.013447; p = 0.0492	Not supported (significant, opposite sign)
H4	LDR moderates the effect of capital adequacy	β CAR×LDR = −0.030736; p = 0.8913	Not supported
H5	LDR moderates the effect of credit risk	β NPL×LDR = 0.247490; p = 0.0157	Statistically supported (moderation present; direction differs from hypothesized strengthening)

Source: Research data, processed at α = 5%.

Hypothesis decisions refer to the full specification because main effects in an interaction model are conditional, so the significance of CAR in Model 1 is not used to accept H1 once the moderator and interactions are included. As Table 12 shows, H1, H2, H3, and H4 are not supported given the respective coefficients and probabilities. The NPL×LDR interaction (0.247490; p = 0.0157) is significant, confirming that credit risk's effect on financial health changes across LDR levels, so moderation itself is statistically supported for H5; however, because the coefficient sign is positive rather than the hypothesized strengthening of NPL's negative effect, H5's specific directional prediction is not supported. This distinction matters: the positive interaction indicates that as LDR rises, the NPL–ROA slope shifts toward less negative (or more positive), not that LDR strengthens NPL's harmful effect as originally hypothesized.

The positive but non-significant CAR coefficient suggests stronger capital tends to associate with higher ROA at mean LDR, consistent with theory, but once liquidity conditions and the two interactions are accounted for, the standard error widens and the effect is no longer significant — ROA variation cannot be explained by the quantity of capital alone. This may arise because, for a BPR, capital functions mainly as a risk buffer while short-term profit is more directly determined by interest margin, credit quality, cost of funds, and efficiency; a bank can have high CAR but low ROA if capital is not followed by quality credit expansion, narrower spreads, or high operating costs. This is consistent with Sochib, Liyundira, and Yulianti (2023), who found no CAR effect on ROA in Indonesian commercial banks, but differs from Barkah and Yuniarti (2025) at PT BPR Siliwangi Tasikmalaya, who found a

significant positive effect — a difference plausibly arising from period, sample size, portfolio structure, and this study's inclusion of interaction terms, underscoring that CAR's effect is contextual.

The negative NPL sign at mean LDR is consistent with theory — non-performing loans withhold interest income, raise collection costs, and prompt provisioning — but the coefficient is not significant, possibly because NPL's profit impact lags due to restructuring and loss-recognition timing, and because the largest NPL increase concentrates toward the end of the sample alongside a surge in LDR and a decline in CAR. Statistically, the NPL coefficient in the interaction model is the slope at mean LDR, not an average effect across the sample; since the NPL×LDR interaction is significant, the non-significant main effect means only that no evidence of a nonzero slope exists near mean LDR, not that NPL has no effect at all. This is consistent with Barkah and Yuniarti (2025) at another BPR but differs from studies finding NPL depresses ROA, an inconsistency plausibly explained by heterogeneity in provisioning policy and loss-recognition lag; testing NPL lagged one to four quarters could clarify whether the profit impact emerges with delay.

The CAR×LDR interaction is clearly not significant, so the data provide no evidence that the CAR–ROA relationship changes systematically as LDR changes; although the CAR slope appears most pronounced at low LDR, the difference itself is not significant, so LDR cannot be categorized as a moderator of the capital-adequacy–ROA relationship over this period. Managerially, maintaining CAR and managing LDR remain two important but largely separate agendas, with capital's effectiveness likely depending more on asset-placement quality and operational efficiency than on credit-disbursement level; the near-zero interaction coefficient and fairly large standard error, attributable to the 32-observation sample and correlation among LDR, CAR, and the interaction term, mean limited statistical power makes “not significant” read as insufficient evidence rather than proof the moderating effect is exactly zero, suggesting replication with a longer span or multi-BPR panel would yield more precise estimates.

In contrast, the NPL×LDR interaction is positive and significant under HAC standard errors, the study's central finding: the marginal association between NPL and ROA differs by LDR level, negative at low LDR, less negative at the mean, and positive at high LDR. This does not mean high NPL benefits a bank; high LDR combined with high NPL remains a risk signal, since liquidity tightens exactly when asset quality worsens, and the positive coefficient may also reflect end-of-period observations with high statistical leverage. Algebraically, the interaction coefficient of 0.247490 means each 10-percentage-point rise in LDR shifts the NPL–ROA slope by about 0.024749 — a change in slope, not a direct change in ROA — possibly reflecting a short-term income effect or a portfolio-composition effect, both of which remain hypotheses requiring further data to verify. Read together with the simple slopes — negative and near 10% significance at low LDR, non-significant at mean and high LDR — support for moderation stems from the shift in slope rather than from NPL being significant at any single point; the defensible formulation is that LDR moderates the NPL–ROA relationship with a weakening negative association as LDR rises, not that LDR strengthens financial health when NPL rises.

The model's R^2 of 58.83% and Adjusted R^2 of 50.92% indicate moderate explanatory power, with about 41.17% of ROA variation attributable to factors outside the model, such as interest margin, cost of funds, credit growth, provisioning, asset structure, and macroeconomic

conditions. Adding LDR raises R^2 by about 4.10 points and the two interactions add a further 6.58 points, though their joint change is not significant at 5% — not contradicted by the individually significant NPL×LDR interaction, since the joint test spends two degrees of freedom and includes the nearly non-contributory CAR×LDR term. This study's contribution lies in shifting from whether CAR, NPL, and LDR affect ROA toward the conditional question of whether the CAR–ROA and NPL–ROA relationships change at different LDR levels; the results show LDR is more relevant as a condition altering the NPL–ROA relationship than the CAR–ROA relationship, a contribution that remains case-specific and warrants testing on a broader BPR panel. Read together, capital provides loss-absorption capacity but does not automatically become profit without productive asset placement; credit generates income, but credit quality determines whether cash flow is realized; and LDR reflects the intensity of fund-to-credit transformation, with liquidity room narrowing at very high levels — so financial performance emerges from the configuration of all three elements rather than fully separate effects, consistent with an integrated risk-management view in which credit risk affects cash inflow while liquidity risk determines capacity to meet outflow, so that when both change together the impact on profit can be nonlinear and delayed.

CONCLUSION

This study concludes that, based on 32 quarterly observations from 2018 to 2025, the average CAR/KPMM was 21.79%, the average gross NPL ratio was 8.75%, the average LDR was 98.87%, and the average ROA was 1.84%. The findings indicate that capital adequacy declined while NPL and LDR increased substantially after 2023, accompanied by weaker profitability. The Moderated Regression Analysis (MRA) model was jointly significant ($F = 7.4318$; $p = 0.0002$) and explained 58.83% of the variation in ROA (Adjusted $R^2 = 50.92\%$). However, capital adequacy ($\beta = 0.071582$; $p = 0.1287$) and credit risk ($\beta = -0.024800$; $p = 0.5298$) did not have significant direct effects on financial performance at the mean level of LDR; therefore, H1 and H2 were not supported. LDR had a negative and significant direct effect on ROA ($p = 0.0492$), which was contrary to the proposed hypothesis, resulting in the rejection of H3. Furthermore, LDR did not significantly moderate the relationship between capital adequacy and ROA ($p = 0.8913$), indicating that H4 was not supported. Conversely, LDR significantly moderated the relationship between credit risk and ROA ($p = 0.0157$). However, the positive interaction coefficient indicated a weakening effect rather than the expected strengthening of the negative relationship between NPL and financial performance, meaning that H5 was only partially supported.

Based on these findings, management is advised to establish an internal LDR limit that is more conservative than the regulatory threshold by implementing early-warning indicators based on stress testing, deposit concentration, and liquidity and maturity profiles. Banks should also develop an integrated monthly credit-quality and liquidity dashboard covering special-mention loans, restructuring recovery rates, loan migration patterns, delinquency trends, provisioning coverage, and funding concentration. Strengthening credit assessment and post-disbursement monitoring is necessary, particularly in loan segments experiencing increasing NPL levels. In addition, differentiated recovery strategies should be implemented based on debtor repayment prospects, supported by quarterly integrated credit and liquidity stress testing linked to a contingency funding plan. Performance evaluation at the business-unit level should

also adopt a balanced scorecard approach that prioritizes portfolio quality rather than merely emphasizing credit expansion. Future research should extend the analysis through multi-BPR panel data, incorporate additional variables such as lagged NPL and net interest margin, and further examine the moderating role of LDR using longer observation periods or higher-frequency data.

REFERENCES

Abbas, F., Iqbal, S., & Aziz, B. (2019). The impact of bank capital, bank liquidity and credit risk on profitability in postcrisis period: A comparative study of US and Asia. *Cogent Economics & Finance*, *7*(1), 1605683. https://doi.org/10.1080/23322039.2019.1605683

Aden, Z. M. (2017). *Effects of credit information sharing on non-performing loans of commercial banks in Kenya*.

Adusei, M., & Adeleye, N. (2022). Credit information sharing and non-performing loans: The moderating role of creditor rights protection. *International Journal of Finance & Economics, 27*(4), 4756–4769.

Algeri, C., Forgione, A. F., & Migliardo, C. (2023). Spatial dependence in the non-performing loans of small Italian cooperative banks. *Regional Studies, 57*(11), 2177–2191.

Anggawulan, M. D. D., & Suardikha, I. M. S. (2021). Capital adequacy ratio, loan to deposit ratio, ukuran perusahaan dan return on assets dengan non-performing loan sebagai variabel pemoderasi. *E-Jurnal Akuntansi*, *31*(1), 130–141. https://doi.org/10.24843/EJA.2021.v31.i01.p10

Ardiantini, L. E., & Susila, G. P. A. J. (2025). Pengaruh capital adequacy ratio, non-performing loan dan loan to deposit ratio terhadap return on asset pada Bank Perkreditan Rakyat di Kabupaten Gianyar. *Prospek: Jurnal Manajemen dan Bisnis, 7*(2). https://doi.org/10.23887/pjmb.v7i2.98811

Berger, A. N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banks. *Journal of Banking & Finance*, *21*(6), 849–870. https://doi.org/10.1016/S0378-4266(97)00003-4

Campanella, F., Gangi, F., Mustilli, M., & Serino, L. (2020). The effects of the credit selection criteria on non-performing loans: Evidence on small and large banks in Italy. *Meditari Accountancy Research, 28*(2), 251–275.

De Sousa, M. M. (2015). *Financial inclusion and global regulatory standards: An empirical study across developing economies*.

Diamond, D. W. (1984). Financial intermediation and delegated monitoring. *The Review of Economic Studies*, *51*(3), 393–414. https://doi.org/10.2307/2297430

Jungo, J., Madaleno, M., & Botelho, A. (2024). The role of financial inclusion and institutional factors on banking stability in developing countries. *International Journal of Development Issues, 23*(3), 361–377.

Mendoza, R., & Rivera, J. P. R. (2017). The effect of credit risk and capital adequacy on the profitability of rural banks in the Philippines. *Scientific Annals of Economics and Business, 64*(1), 83–96. https://doi.org/10.1515/saeb-2017-0006

Ofoeda, I., Amoah, L., Anarfo, E. B., & Abor, J. Y. (2024). Financial inclusion and economic growth: What roles do institutions and financial regulation play? *International Journal of Finance & Economics, 29*(1), 832–848.

Ofoeda, I., Mawutor, J. K. M., & Ohenebeng, D. N. F.-H. (2024). Financial inclusion, institutional quality and bank stability: Evidence from sub-Saharan Africa. *International Economics and Economic Policy, 21*(1), 27–64.

PT BPR Kerta Raharja (Perseroda). (2026a). *Jaringan kantor cabang*.

https://bankkertaraharja.co.id/jaringan-kantor-cabang
PT BPR Kerta Raharja (Perseroda). (2026b). *Profil dan layanan PT BPR Kerta Raharja (Perseroda)*. https://bankkertaraharja.co.id/
PT BPR Kerta Raharja (Perseroda). (2026c). *Rekap CAR, ROA, BOPO, dan NPL tahun 2016–2025* [Dokumen internal].
Saha, M., & Dutta, K. D. (2024). Do macroprudential regulations condition the role of financial inclusion for ensuring financial stability? Cross-country perspective. *International Journal of Emerging Markets*, *19*(7), 1769–1803.
Sastrawan, R., Saputra, E., & Pratiwi, N. (2023). Determinan profitabilitas dengan rasio pinjaman terhadap simpanan sebagai variabel moderasi. *Jurnal Akuntansi dan Keuangan*, *11*(1), 57–64. https://doi.org/10.29103/jak.v11i1.9772
Taujanskaite, K., Milcius, E., & Saltenis, S. (2016). Control of non-performing loans in retail banking by raising financial and consumer awareness of clients. *Engineering Economics*, *27*(4), 405–416.
Widyastuti, P. F., & Aini, N. (2021). Pengaruh CAR, NPL, dan LDR terhadap profitabilitas bank (ROA) tahun 2017–2019. *JIMAT (Jurnal Ilmiah Mahasiswa Akuntansi)*, *12*(3), 1020–1026. https://doi.org/10.23887/jimat.v12i3.37828