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The Effects of Credit Risk, Liquidity, and Capital on Profitability of Digital Banks in Indonesia For The Period 2021-2025

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Abstract: This study empirically examines the influence of credit risk, liquidity, and capital adequacy on the profitability of digital banks operating in Indonesia throughout the 2021–2025 period. Employing a quantitative research design with a descriptive approach, this investigation utilizes secondary data derived from quarterly audited financial statements of eight digital banks registered under the supervision of the Financial Services Authority, yielding a total of 160 observational units. The panel data regression technique is applied with the Random Effect Model selected as the most appropriate estimation framework following the Chow, Hausman, and Lagrange Multiplier specification tests. To correct for heteroscedasticity, the model is re-estimated utilizing White cross-section standard errors, thereby ensuring the robustness of the statistical inferences. The empirical findings reveal that, when considered jointly, credit risk, liquidity, and capital adequacy exert a statistically significant influence on profitability. However, at the partial level, only liquidity, as proxied by the Loan to Deposit Ratio, demonstrates a positive and statistically significant impact on Return on Assets. In contrast, credit risk, measured by the Non-Performing Loan ratio, and capital adequacy, represented by the Capital Adequacy Ratio, exhibit no statistically significant effects on profitability. These results substantiate that the traditional intermediation function continues to serve as the fundamental driver of profitability within the digital banking sector. Meanwhile, credit risk management and capital buffers function primarily as prudential instruments for risk mitigation rather than as direct determinants of earnings performance. This study contributes to the theoretical extension of the Financial Intermediation Theory by contextualizing its applicability within the rapidly evolving landscape of digital banking in emerging economies.

Keyword: Credit Risk, Liquidity, Capital, Profitability.

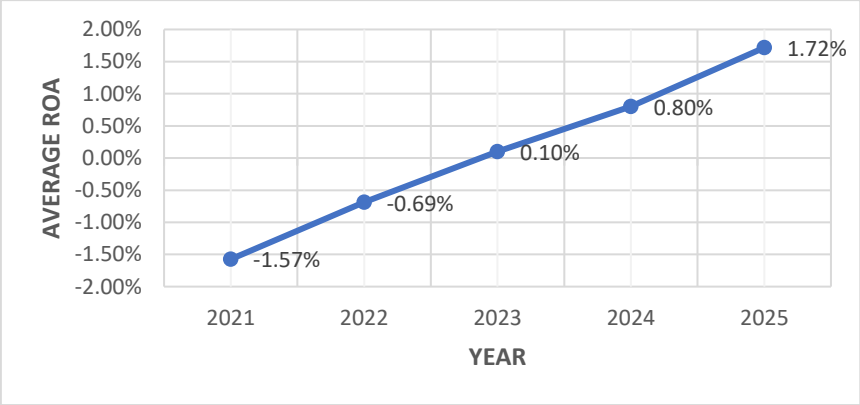
INTRODUCTION

Financial institutions such as banks have a significant impact on a country's economy, both at the macro and micro levels. As the backbone of the national economy, the banking sector must be able to maintain stability and soundness in carrying out its function of mobilizing third-party funds (DPK) to be channeled in the form of financing to various sectors

(Tarigant et al., 2022). As technology advances, the products and services offered by banks have become increasingly diverse to facilitate all types of transactions needed by the public (Jalihh & Rani, 2020). Digital banks are a prime example of how banks are evolving their business strategies to enhance efficiency and the quality of service provided to customers. Based on OJK Regulation No. 12/POJK.03/2021, a digital bank is defined as an Indonesian Legal Entity Bank (BHI) that operates primarily through electronic networks, thus requiring no physical branches other than its headquarters or using physical branches only on a limited basis.

The current growth of digital banks is supported by a massive financial ecosystem. Bank Indonesia data for the third quarter of 2025 shows that the volume of digital payment transactions reached 12.99 billion (up 38.08% year-over-year) with a transaction value of Rp59.4 thousand trillion, or about three times Indonesia's GDP. Synergy between Bank Indonesia and the OJK through initiatives such as FEKDI x IFSE 2025 is accelerating the nation's digital transformation through payment system innovations. Amid global dynamics, prudent monetary policy (November 2025 RDG: BI Rate at 4.75%) and the maintenance of financial system stability—with credit growth of 7.70% (year-over-year) and deposit growth of 11.18% (year-over-year) in the third quarter of 2025—provide a conducive foundation for digital banks to operate.

Despite the rapid expansion of digital transactions, digital banks continue to face substantial challenges in maintaining sustainable profitability.



Source: Financial Reports of Respective Banks, processed

Figure 1. Trends in ROA for Digital Banks in Indonesia (2021–2025)

Based on Figure 1, the average ROA of digital banks in Indonesia for the 2021–2025 period shows a consistent upward trend. From 2021 to 2022, the ROA remained negative at -1.57% and -0.69%, respectively. These figures indicate that, on an aggregate basis, digital banks have not yet been able to generate profits due to high operating costs and investments during the initial stages. However, profitability subsequently continued to improve by 0.10% in 2023, eventually surging by 0.80% in 2024 and reaching 1.72% in 2025. This trend demonstrates that asset management at digital banks is becoming increasingly efficient and that they are optimizing their technology-based business models. Given this phenomenon, it is important to further examine various factors that impact ROA growth, such as credit risk (NPL), liquidity (LDR), and capital adequacy (CAR).

Pursuant to the provisions of POJK No. 6/POJK.03/2016 concerning Risk Management for Commercial Banks, the Financial Services Authority (OJK) requires banks to implement effective risk management practices, particularly in managing credit risk, which represents one of the primary threats to banking operations. Credit risk is reflected in the Non-Performing Loan (NPL) ratio. A higher NPL ratio indicates a greater level of problem loans, which may

lead to a decline in interest income and an increased potential for financial losses. Dewi et al. (2023) and Sembiring (2021) found that NPL has a negative effect on Return on Assets (ROA). In contrast, Wetapo et al. (2023), Putri and Wahyudi (2023), and Iswardhani et al. (2026) found that Non-Performing Loan (NPL) does not have a statistically significant effect on profitability. These inconsistent findings suggest that the relationship between NPL and profitability may be influenced by other factors, such as operational efficiency and capital structure.

In accordance with OJK Regulation No. 6/POJK.03/2016, banks are required to implement effective liquidity risk management to ensure adequate liquidity and maintain financial stability. The Loan to Deposit Ratio (LDR) reflects the extent to which banks utilize Third-Party Funds (TPF) to finance lending activities and serves as an important indicator of liquidity management and financial intermediation. An optimal LDR may enhance banks' interest-generating capacity and, consequently, contribute to higher profitability. However, an excessively high LDR may increase banks' exposure to liquidity risk, particularly when the expansion of lending activities is not adequately supported by sufficient funding and liquid assets.

Empirical evidence from previous studies predominantly demonstrates a positive and statistically significant effect of LDR on Return on Assets (ROA), as documented by Dewi et al. (2023), Wetapo et al. (2023), Putri and Wahyudi (2023), Panjaitan et al. (2025), and Putri and Bella (2025). This finding suggests that a higher level of financial intermediation may enable banks to optimize their lending activities and generate greater interest income, thereby improving profitability. Nevertheless, contradictory evidence has been reported by Joysinta and Amalina (2026) and Iswardhani et al. (2026), who found that LDR does not exert a statistically significant effect on profitability. The inconsistency among these empirical findings indicates that the relationship between LDR and bank profitability remains inconclusive and may be contingent upon other bank-specific factors, including liquidity management, operational efficiency, and capital adequacy.

Pursuant to the regulations established by the Otoritas Jasa Keuangan (OJK), banks are required to maintain adequate capital resilience through the Minimum Capital Adequacy Requirement (KPMM). In this context, the Capital Adequacy Ratio (CAR) serves as a key indicator of a bank's capacity to maintain sufficient capital buffers to absorb potential losses arising from its assets.

A higher Capital Adequacy Ratio (CAR) reflects a stronger capital position and enhances a bank's capacity to expand its lending activities. Adequate capitalisation also strengthens the bank's resilience against potential financial losses and may foster greater depositor and customer confidence, thereby contributing to improved Return on Assets (ROA). In accordance with the applicable banking regulatory framework, banks are required to maintain a minimum CAR of 8%. Accordingly, maintaining CAR at an adequate and prudent level is essential not only for ensuring financial stability and absorbing potential losses but also for supporting the sustainable profitability of banking institutions.

Dewi et al. (2023) and Panjaitan et al. (2025) found that the Capital Adequacy Ratio (CAR) has a positive and statistically significant effect on Return on Assets (ROA). However, Wetapo et al. (2023), Sembiring (2021), Putri and Wahyudi (2023), Putri and Bella (2025), and Joysinta and Amalina (2026) reported that CAR does not have a statistically significant effect on profitability. These divergent empirical findings indicate that the relationship between capital adequacy and bank profitability remains inconclusive.

The novelty of the present study lies primarily in its research subject. While the majority of previous studies have focused on conventional banks listed on the Indonesia Stock Exchange (IDX), this study re-examines the effects of Non-Performing Loan (NPL), Loan to Deposit Ratio (LDR), and Capital Adequacy Ratio (CAR) on bank profitability, as measured by Return on Assets (ROA), with a specific focus on digital banks registered with and supervised by the

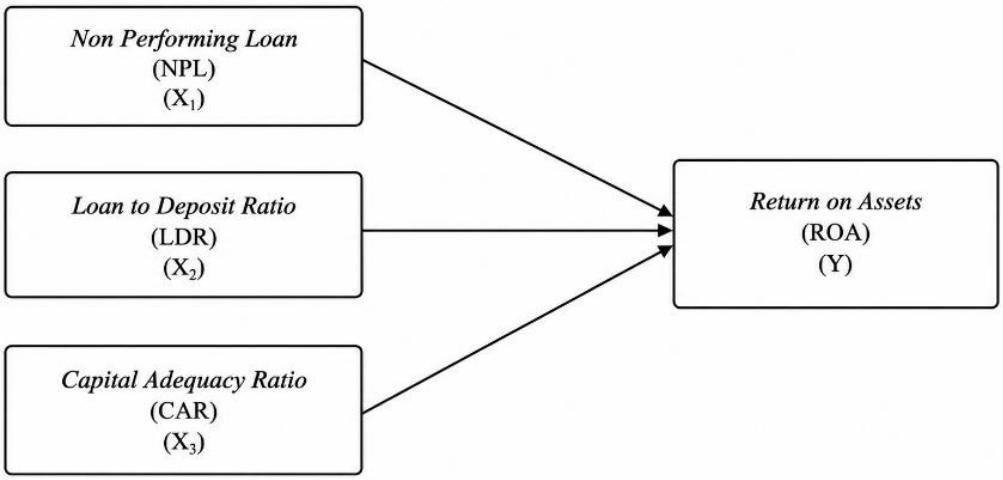
Otoritas Jasa Keuangan (OJK). By focusing on digital banking institutions, this study seeks to provide empirical evidence on whether the determinants of profitability identified in conventional banking contexts remain applicable within the rapidly evolving digital banking sector.

METHOD

This research employs a quantitative approach with a descriptive design. The descriptive approach is used to describe the condition and development of financial ratios of digital banks during the 2021-2025 period. The data used in this study is secondary data, namely data that has been collected and published by other entities. The research data consists of quarterly (3-month) audited financial reports of digital banks during the 2021-2025 period. The data was obtained through the official websites of each bank, the Indonesia Stock Exchange (IDX), and the Financial Services Authority (OJK).

The variables in this study consist of independent and dependent variables. The independent variables include: Credit risk measured by Non-Performing Loan (NPL), which is the ratio of non-performing loans to total loans, Liquidity measured by Loan to Deposit Ratio (LDR), which is the ratio of total loans to total third-party funds and Capital measured by Capital Adequacy Ratio (CAR), which is the ratio of capital to risk-weighted assets. The dependent variable is profitability measured by Return on Assets (ROA), which is the ratio of pre-tax profit to average total assets.

The population in this study is digital banks in Indonesia licensed by the OJK during the 2021-2025 period, totaling 8 digital banks. The sampling technique used is purposive sampling, which is based on specific considerations and criteria aligned with the research objectives (Kuncoro, 2013). Eight digital banks were selected as the sample, resulting in 160 observations (8 banks × 20 quarters from Q1 2021 to Q4 2025).



Source: (Dewi et al. 2023, Panjaitan et al. 2025, Joysinta & Amalina, 2026, Iswardhani et al. 2026)

Figure 2. Conceptual Framework

The analytical technique employs panel data regression with the following model specification:

$$ROA\_it = \alpha + \beta_1 NPL\_it + \beta_2 LDR\_it + \beta_3 CAR\_it + \varepsilon\_it$$

Where ROA represents profitability, NPL denotes credit risk, LDR indicates liquidity, CAR reflects capital adequacy, α is the intercept, β_1, β_2, β_3 are regression coefficients, ε is the error term, i denotes individual banks (1–8), and t represents quarterly periods (1–20). Model

selection is conducted through Chow, Hausman, and Lagrange Multiplier tests to determine the most appropriate estimation framework among Common Effect, Fixed Effect, and Random Effect Models. Classical assumption tests including multicollinearity and heteroscedasticity are performed, with heteroscedasticity corrected using White cross-section standard errors. Hypothesis testing employs coefficient of determination (R^2), simultaneous F-test, and partial t-test at $\alpha = 0.05$ significance level. All analyses are executed using EViews software.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 1. Descriptive Statistics

	Y_ROA	X1_NPL	X2_LDR	X3_CAR
Mean	0.003224	0.026128	0.950246	0.766499
Median	0.004950	0.017400	0.800600	0.437900
Maximum	0.069400	0.140200	3.736100	11.07970
Minimum	-0.147500	0.000000	0.000000	0.174800
Std. Dev.	0.035812	0.028503	0.619638	1.135591
Observations	160	160	160	160

Source: Secondary data, processed by the author

The ROA variable exhibits a mean of 0.32% and a median of 0.50%. The maximum ROA of 6.94% was recorded by Amar Bank in Q1 2025, which falls into the "Very Healthy" category according to Bank Indonesia (2011) standards (ROA > 1.5%), indicating superior asset utilization efficiency. The minimum ROA of -14.75% was recorded by Bank Raya Indonesia in Q4 2021, falling into the "Unhealthy" category (ROA ≤ 0%), reflecting significant losses during that period. The standard deviation of 3.58% indicates considerable variation in profitability performance across banks and periods.

The NPL variable shows a mean of 2.61% and a median of 1.74%. The maximum NPL of 14.02% was recorded by Bank Raya Indonesia in Q4 2025, which falls into the "Unhealthy" category according to Bank Indonesia (2011) standards (NPL ≥ 12%), indicating severe credit quality deterioration. The minimum NPL of 0.00% was achieved by Bank Jago from Q1 2021 to Q2 2022, falling into the "Very Healthy" category (NPL < 2%), reflecting excellent credit risk management. The standard deviation of 2.85%, exceeding the mean, reflects relatively high dispersion in credit risk levels across banks.

The LDR variable exhibits a mean of 95.02% and a median of 80.06%. The maximum LDR of 373.61% was recorded by Amar Bank in Q4 2023, falling into the "Unhealthy" category according to Bank Indonesia (2004) standards (LDR > 120%), indicating excessive credit distribution relative to deposits and elevated liquidity risk. The minimum LDR of 0.00% was recorded by BluBca in Q1 and Q2 2021, falling into the "Very Healthy" category (50% < LDR ≤ 75%), reflecting conservative liquidity management. The standard deviation of 61.96% indicates very high variation in liquidity management strategies across digital banks.

The CAR variable shows a mean of 76.65% and a median of 43.79%. The maximum CAR of 1,107.97% was recorded by BluBca in Q3 2021, falling into the "Very Healthy" category according to Bank Indonesia (2011) standards (CAR ≥ 12%), reflecting extremely high capital relative to risk-weighted assets during the bank's early operational phase. The minimum CAR of 17.48% also falls into the "Very Healthy" category (CAR ≥ 12%), remaining well above the regulatory minimum of 8%. The standard deviation of 113.56% indicates exceptionally high variation in capital adequacy levels across the sample.

Selection of Regression Model

Table 2. Panel Data Regression Model Selection

No.	Test	Comparison	Probability	Selected Model
1.	Chow Test	CEM vs FEM	0.0002	FEM
2.	Hausman Test	FEM vs REM	0.4477	REM
3.	Lagrange Multiplier Test	REM vs CEM	0.0000	REM

Source: Secondary data, processed by the author (2026).

The three model selection tests consistently identify the Random Effect Model (REM) as the most appropriate final model. The Chow test yielded a Chi-square probability value of 0.0002, indicating that the Fixed Effect Model (FEM) is more appropriate than the Common Effect Model (CEM). Subsequently, the Hausman test produced a probability value of 0.4477, indicating that the Random Effect Model (REM) is preferable to the FEM. Finally, the Lagrange Multiplier (LM) test resulted in a probability value of 0.0000, confirming that the REM is more appropriate than the CEM. Therefore, based on the results of these three specification tests, the Random Effect Model is selected as the final estimation model for the panel data analysis.

Multikolinieritas Test

A multicollinearity test was conducted to determine whether there were strong linear relationships among the independent variables in the model. Based on the criteria used in the source text, if the correlation coefficient between independent variables is ≤ 0.80, the model is considered free of multicollinearity, whereas a correlation > 0.80 indicates the presence of multicollinearity. These criteria are based on Ghozali and Ratmono (2017).

Table 3. Multicollinearity Test

	X1_NPL	X2_LDR	X3_CAR
X1_NPL	1.0000	0.5088	-0.1067
X2_LDR	0.5088	1.0000	0.0472
X3_CAR	-0.1067	0.0472	1.0000

Source: Secondary data, processed by the author (2026)

The results of the correlation matrix show that the correlation between NPL and LDR is 0.5088, between NPL and CAR is -0.1067, and between LDR and CAR is 0.0472. All correlation values between the independent variables are below the 0.80 threshold. Thus, H0 is accepted, and the regression model does not exhibit multicollinearity. This means there is no strong linear relationship among the variables NPL, LDR, and CAR that could potentially disrupt the stability of the regression coefficient estimates.

Heteroskedastisitas Test

Table 4. Heteroskedastisitas Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.016546	0.003657	4.524954	0.0000
X1_NPL	0.273803	0.077618	3.527566	0.0006
X2_LDR	-0.004754	0.003554	-1.337552	0.1830
X3_CAR	0.000950	0.001679	0.566025	0.5722

Source: Secondary data, processed by the author (2026).

The Glejser test indicates a probability of 0.0006 for NPL, 0.1830 for LDR, and 0.5722 for CAR. Thus, NPL shows signs of heteroscedasticity, while LDR and CAR do not. To obtain

more robust inferences, the final estimates were calculated using REM with White cross-section standard errors.

Regression Results and Hypothesis Testing

Table 5. Random Effects Model Estimation with White Cross-Section Clustered Standard Errors

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.012974	0.008367	-1.550711	0.1375
X1_NPL	-0.245760	0.165993	-1.480542	0.1551
X2_LDR	0.025787	0.003960	6.512533	0.0000
X3_CAR	-0.002459	0.001245	-1.975015	0.0630
Weighted Statistics				
R-squared	0.119343	Mean dependent var		0.001436
Adjusted R-squared	0.102408	S.D. dependent var		0.031201
S.E. of regression	0.029560	Sum squared resid		0.136315
F-statistic	7.046852	Durbin-Watson stat		0.622154
Prob(F-statistic)	0.000179			

Source: Secondary data, processed by the author using EViews 13 (2026).

The final regression equation is

ROA = -0.0130 – 0.2458NPL + 0.0258LDR – 0.0024CAR + ε.

The LDR coefficient of 0.0258 indicates that a 0.01 (one percentage point) increase in LDR is associated with a 0.000258 increase in ROA, assuming all other variables remain constant (ceteris paribus).

The adjusted R-squared value of 0.1024 indicates that NPL, LDR, and CAR collectively explain 10.24% of the variation in ROA, while the remaining 89.76% is explained by other factors outside the model, such as BOPO, NIM, and firm size.

The F-test yielded a probability value of 0.0002, indicating that NPL, LDR, and CAR jointly have a significant effect on ROA.

Discussion

Based on a panel data regression analysis using the Random Effects Model (REM), which was re-estimated using the White method for cross-sectional standard errors to account for heteroscedasticity, the research findings reveal that, taken together, the variables Credit Risk (NPL), Liquidity (LDR), and Capital Adequacy (CAR) have a significant impact on the Profitability (ROA) of digital banks in Indonesia for the 2021–2025 period. However, when analyzed individually, only Liquidity (LDR) has a positive and significant impact, while Credit Risk (NPL) and Capital Adequacy (CAR) do not have a significant impact on Profitability (ROA).

1. Effect of Credit Risk (NPL) on Profitability (ROA)

The finding that NPL does not significantly affect ROA indicates that variations in non-performing loan levels have not been statistically proven to influence the capacity of digital banks to generate profits. The average NPL of 2.62% remains relatively low with modest variation (standard deviation of 2.85%), suggesting that differences in credit risk levels across digital banks are insufficient to produce measurable effects on profitability. Although the maximum NPL reached 14.02%, the overall manageable credit quality indicates that digital banks have effectively maintained credit standards. This can be explained through Financial Intermediation Theory (Mishkin & Eakins, 2023; Freixas & Rochet, 2023), which posits that banks function as intermediaries that collect and distribute funds. While increased non-performing loans should theoretically compress profitability through elevated provisioning expenses, this mechanism has not materialized significantly among digital banks. Digital banks

possess distinct operational characteristics, particularly the utilization of big data-based credit scoring technologies enabling selective credit distribution to quality debtors, technology-enhanced monitoring systems, and diversified income streams beyond traditional lending. These factors reduce the sensitivity of profitability to credit risk fluctuations. This finding aligns with Wetapo et al. (2023), Putri and Wahyudi (2023), Putri and Bella (2025), and Iswardhani et al. (2026), but contradicts Dewi et al. (2023) and Sembiring (2021), likely due to differences in research subjects where previous studies focused on conventional banks.

2. Effect of Liquidity (LDR) on Profitability (ROA)

The finding that LDR exerts a positive and significant effect on ROA confirms that optimal channeling of third-party funds into credit remains the primary driver of profitability in digital banks. The coefficient of 0.0258 implies that each 1 percentage point increase in LDR corresponds to a 0.0258 percentage point increase in ROA. The average LDR of 95.02% falls within the "Fairly Healthy" category (85% < LDR ≤ 100%) according to Bank Indonesia (2004) standards, indicating that digital banks have effectively deployed most mobilized funds into productive credit. The substantial variation in LDR values (standard deviation of 61.96%, ranging from 0% to 373.61%) reflects different developmental stages and strategic orientations across digital banks. This positive relationship is grounded in Financial Intermediation Theory (Mishkin & Eakins, 2023), emphasizing that higher LDR implies greater funds deployed in income-generating credit activities, enhancing profitability. This finding is consistent with Dewi et al. (2023), Panjaitan et al. (2025), Wetapo et al. (2023), Putri and Wahyudi (2023), and Iswardhani et al. (2026). Despite the positive relationship, digital bank management must remain vigilant regarding liquidity risks, as excessively high LDR could create vulnerabilities in the event of sudden fund withdrawals.

3. Effect of Capital (CAR) on Profitability (ROA)

The finding that CAR does not significantly affect ROA indicates that variations in capital adequacy levels have not directly influenced profitability performance. Although the probability value of 0.0630 approaches the 0.05 significance threshold, it remains above the conventional level. The average CAR of 76.65% substantially exceeds the OJK minimum requirement of 8%, falling into the "Very Healthy" category according to Bank Indonesia (2011) standards, with both maximum (1,107.97%) and minimum (17.48%) values remaining well above regulatory requirements. The enormous standard deviation of 113.56% reflects extreme variation in capital adequacy levels, yet the absence of significant CAR-ROA relationship suggests that excess capital does not necessarily translate into enhanced profitability. This can be explained through Financial Intermediation Theory (Freixas & Rochet, 2023), which positions capital primarily as a risk buffer rather than a productive income-generating asset. When capital levels already exceed regulatory requirements and risk absorption needs, additional capital does not produce marginal profitability improvements. This finding aligns with Wetapo et al. (2023), Sembiring (2021), Putri and Wahyudi (2023), Putri and Bella (2025), and Joysinta and Amalina (2026), but contradicts Dewi et al. (2023) and Panjaitan et al. (2025). The contradiction is likely attributable to sample characteristics, where previous studies focused on conventional banks with CAR levels closer to the regulatory minimum, making the CAR-ROA relationship more visible. In contrast, digital banks exhibit very high average CAR levels, reducing sensitivity to profitability variations. For digital banks, capital functions more as a regulatory compliance mechanism and risk buffer rather than as a direct driver of profitability. Nevertheless, maintaining CAR at appropriate levels remains essential for regulatory compliance and long-term stability of intermediation functions.

CONCLUSION

Based on the findings of a study on the impact of credit risk (NPL), liquidity (LDR), and capital (CAR) on the profitability (ROA) of digital banks in Indonesia during the 2021–2025

period, it can be concluded that credit risk (NPL) does not have a significant impact on profitability, indicating that digital banks have been able to maintain credit quality through effective risk management, the use of technology, and revenue diversification, thereby mitigating the direct impact of rising NPLs on profit optimization. Liquidity (LDR) has a positive and significant impact on profitability, confirming that the more effectively digital banks channel third-party funds into loans, the higher the resulting profitability indicating that the intermediation function remains the primary driver of profit growth in digital banks.

Capital adequacy ratio (CAR) does not have a significant impact on profitability, suggesting that capital adequacy serves more as a means of regulatory compliance and a risk buffer than as a factor that directly increases a company's profits. At the same time, credit risk (NPL), liquidity (LDR), and capital (CAR) were found to have a significant impact on profitability, confirming that the combination of these three variables collectively plays a crucial role in determining the profitability dynamics of digital banks in Indonesia, with liquidity emerging as the most dominant factor influencing profitability performance.

REFERENCE

Abdullah, I. N. (2025). The full list of digital banks in Indonesia and their top benefits (2026). Fintech News Indonesia. Diakses dari Fintech News Indonesia

Agnesa (2026). Daftar lengkap bank digital resmi Indonesia 2026 yang sudah terdaftar dan diawasi OJK. Diakses dari Metaloka Perbankan Digital Resmi Indonesia 2026

Ajija, S. R., Sari, D. W., Setianto, R. H., & Primanti, M. R. (2011). Cara cerdas menguasai EViews. Salemba Empat.

ANTARA Infografik Perbankan Digital 2024

ANTARA. (2024). Transaksi perbankan digital 2024 tumbuh pesat. Diakses dari:

Bank Indonesia. (2004). Surat Edaran Bank Indonesia Nomor 6/23/DPNP tanggal 31 Mei 2004 tentang Sistem Penilaian Tingkat Kesehatan Bank Umum. Jakarta: Bank Indonesia.

Bank Indonesia. (2011). Kodifikasi Penilaian Tingkat Kesehatan Bank. Jakarta: Bank Indonesia. Diakses dari Bank Indonesia - Kodifikasi Penilaian Tingkat Kesehatan Bank

Bank Indonesia. (2025). FEKDI x IFSE 2025 (Siaran Pers, 30 Oktober 2025). Di akses dari Bank Indonesia Digitalisasi Ekonomi Keuangan Kunci Pertumbuhan Ekonomi Masa Depan

Bank Indonesia. (2025). Laporan Kebijakan Moneter Triwulan III 2025. https://www.bi.go.id/id/publikasi/laporan/Pages/Laporan-Kebijakan-Moneter-Triwulan-III-2025.aspx

Bank Indonesia. (2025). Siaran Pers RDG November 2025. https://www.bi.go.id/id/publikasi/ruang-media/news-release/Pages/sp_2727425.aspx

Basuki, A. T. (2021). Analisis Data Panel dalam Penelitian Ekonomi dan Bisnis (Dilengkapi dengan Penggunaan Eviews) (Edisi Pert). Rajawali Press. https://ekonometrikblog.wordpress.com/wp-content/uploads/2021/08/draft-buku-analisis-data-panel-dalam-penelitian-ekonomi-dan-bisnis-2021-dikompresi.pdf

Brigham, E. F., & Houston, J. F. (2019). Fundamentals of Financial Management. Cengage Learning. https://digilib.stekom.ac.id/assets/dokumen/ebook/feb_A8yLONvsXAEumI-eyUDO-KqX7dg-e7BYgDan8TuIkA7Wot4C_n_VQA_1723022634.pdf

Connelly, B. L. (2024). Signaling Theory and its Implications. Journal of Management. https://doi.org/10.1177/01492063241268459

Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling Theory: A Review and Assessment. Journal of Management, 37(1), 39–67. https://doi.org/10.1177/0149206310388419

Dendawijaya, L. (2009). Manajemen Perbankan (Kedua). Ghalia Indonesia.

Dewi, N. L. G. S., Tahu, G. P., & Gunadi, I. Gst. N. B. (2023). Pengaruh Capital Adequacy Ratio (CAR), Non Performing Loan (NPL), dan Loan To Deposit Ratio (LDR) Terhadap Profitabilitas pada Perusahaan Perbankan di Bursa Efek Indonesia. Jurnal EMAS, 4(7), 1819–1822.

Freixas, Xavier dan Jean-Charles Rochet. 2023. Microeconomics of Banking. Edisi Ketiga. Cambridge, Massachusetts: MIT Press.

Ghozali, I., & Ratmono, D. (2017). Analisis multivariat dan ekonometrika: Teori, konsep, dan aplikasi dengan EViews 10 (Edisi 2). Badan Penerbit Universitas Diponegoro.

Gibson, C. H. (2013). Financial Reporting and Analysis (13th Editi). South-Western Cengage Learning.

Gibson, C. H., & Veith, J. T. (2012). Financial Reporting and Analysis: Using Financial Accounting Information (13th ed.). South-Western Cengage Learning.

Gitman, L. J., & Zutter, C. J. (2015). Principles of Managerial Finance, Global Edition (14th ed.). Pearson Education Limited. https://za.pearson.com/content/dam/region-growth/south-africa/pearson-south-africa/TVET/newReport191Titles/documents/9781485709190-Principles-of-Managerial-Finance-Chapters-1.pdf

Gitman, L. J., & Zutter, C. J. (2018). Principles of Managerial Finance: Global Edition. Pearson Education Limited. https://www.scribd.com/document/1012355923

Gujarati, D. N. (2003). Basic Econometrics (Edisi ke-4). McGraw Hill.

Iswardhani, I., Rahmat, M. R. A., Sandira, N. F. A., Sarah, N., & Nasir, S. A. (2026). Pengaruh Risiko Likuiditas dan Risiko Kredit terhadap Kinerja Keuangan pada Bank Digital Periode 2020-2024. JEMSI (Jurnal Ekonomi, Manajemen, Dan Akuntansi), 12(1), 662–670. https://doi.org/10.35870/jemsi.v12i1.5904

Joysinta, A. C., & Amalina, N. (2026). Analisis Pengaruh LDR, CAR dan BOPO terhadap ROA pada Bank KBMI 3–4. Journal of Artificial Intelligence and Digital Business (RIGGS), 5(1), 354–360. https://doi.org/10.31004/riggs.v5i1.5874

Kasmir. (2014). Analisis Laporan Keuangan. PT RajaGrafindo Persada.

Kasmir. (2018). Analisis Laporan Keuangan. PT RajaGrafindo Persada.

Krahara, Y. D., Susanto, S., Chakim, M. H. R., Abbas, M. A. Y., Maradidya, A., Jannah, M., Lestari, R. F., Hendrawan, A., Gusnafitri, Yustini, S., Taruna, M. S., Wulandari, R. W., Tadjie, G. S., Iswardhani, I., Milzam, M., Noerhatini, P., Ikraman, & Aulia, D. (2025). Manajemen risiko keuangan: Teori dan aplikasi. Sada Kurnia Pustaka.

Kuncoro, M. (2013). Metode Riset untuk Bisnis & Ekonomi (4th ed.). Erlangga.

Mishkin, F. S., & Serletis, A. (2011). The economics of money, banking, and financial markets (4th Canadian ed.). Pearson Canada.

Otoritas Jasa Keuangan. (2016). Peraturan Otoritas Jasa Keuangan Nomor 4/POJK.03/2016 tentang Penilaian Tingkat Kesehatan Bank Umum. Otoritas Jasa Keuangan.

Otoritas Jasa Keuangan. (2016). Peraturan Otoritas Jasa Keuangan Nomor 11/POJK.03/2016 tentang Kewajiban Penyediaan Modal Minimum Bank Umum. Otoritas Jasa Keuangan.

Otoritas Jasa Keuangan. (2020). Surat Edaran Otoritas Jasa Keuangan Nomor 9/SEOJK.03/2020 tentang Transparansi Dan Publikasi Laporan Bank Umum Konvensional. Otoritas Jasa Keuangan.

Otoritas Jasa Keuangan. (2023). Peraturan OJK Nomor 21/POJK.03/2023 tentang Layanan Digital Oleh Bank Umum. Otoritas Jasa Keuangan.

Panjaitan, I. F., Siallagan, H., & Sijabat, J. (2025). Pengaruh Kecukupan Modal, Risiko Kredit, Likuiditas Terhadap Profitabilitas Perusahaan Sektor Perbankan yang Terdaftar di Bursa Efek Indonesia Periode 2021-2023. Jurnal Lentera Bisnis, 14(1), 880–883. https://doi.org/10.34127/jrlab.v14i1.1447

Putri, A. P. J., & Wahyudi, I. (2023). Pengaruh Risiko Kredit, Risiko Likuiditas, Modal Bank dan Efisiensi Operasional Terhadap Profitabilitas Bank. Jurnal Ilmiah MEA (Manajemen, Ekonomi, Dan Akuntansi), 7(3), 79–83.

Putri., & Bella, C. (2025). Pengaruh Capital Adequacy Ratio (CAR), Non Performing Loan (NPL), Loan to Deposit Ratio (LDR) dan Net Interest Margin (NIM) Terhadap Return on Asset (ROA). Jambura Economic Education Journal, 7(3), 1015–1032. https://ejurnal.ung.ac.id/index.php/jej/index.

Sarwoko. (2005). Dasar-dasar ekonometrika (1st ed.). ANDI.

Sembiring, S. (2021). Pengaruh Resiko Kredit, Kecukupan Modal, Hutang, dan Pendapatan Bunga Terhadap Profitabilitas pada Perusahaan Perbankan yang Terdaftar di Bursa Efek Indonesia. JRAK, 7(2), 234–251.

Spence, M. (1974). Market Signaling: Informational Transfer in Hiring and Related Screening Processes. Harvard University Press. https://books.google.com/books?id=lkHZAAAAIAAJ

Subroto, V. K., & Endaryati, E. (2024). Kumpulan Teori Akuntansi (First Edit). Yayasan Prima Agus Teknik bekerja sama dengan Universitas STEKOM.

Susanto, M. E., & Davianti, A. (2023). Kinerja Keuangan Bank Konvensional dan Digital Sebelum dan Selama Pandemi COVID-19. Jurnal Akuntansi Aplikasi, 8(1). https://doi.org/10.29303/jaa.v8i1.225

Tarigan, S. M. D., Gama, A. W. S., & Astiti, N. P. Y. (2022). Pengaruh Capital Adequacy Ratio, Biaya Operasional Pendapatan Operasional, Loan to Deposit Ratio, Profitabilitas dan Risiko Pasar terhadap Harga Saham pada Bank Umum yang Terdaftar di Bursa Efek Indonesia Tahun 2017-2019. VALUES: Jurnal Manajemen Dan Akuntansi, 3(2), 319–334.

Wetapo, U., Elisa, & Purnamasari, K. (2023). Pengaruh Kecukupan Modal, Risiko Kredit, Efisiensi, dan Likuiditas Terhadap Profitabilitas Perbankan. Jurnal Manajemen, 11(1), 82–84.