

Analysis of Bank Health Levels Using Risk-Based Bank Rating (RBBR) With Rgec Factors: A Case Study of 4 Digital Banks Listed on the IDX for the Period 2019-2024

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ABSTRACT

This study analyzes the financial health and performance of four digital banks listed on the Indonesia Stock Exchange (IDX), namely Bank Amar, Bank Jago, Allo Bank, and Bank Neo Commerce, during the 2019–2024 period using RGEK method. A quantitative approach was applied by secondary data obtained from audited financial reports officially published by each bank and verified by the Financial Services Authority (OJK). The assessment includes NPL and LDR as indicators of risk profile, GCG composite for governance, ROA, ROE, NIM, and BOPO for profitability analysis, and CAR for capital adequacy evaluation. The results indicate that overall, these banks possess strong capital resilience, improving asset quality, and positive profitability trends, though several still face liquidity and income fluctuation risks.

INTRODUCTION

Banks serve as key financial intermediaries by mobilizing public funds through deposits and channeling them as credit to individuals, businesses, and micro, small, and medium enterprises. This role drives economic growth and financial inclusion, as reflected in a 10.27% year-on-year increase in credit in 2025, accompanied by strong deposit growth. Banks also maintain liquidity ratios above regulatory requirements to ensure customer obligations are met (OJK, 2025). The primary objective is to maximize profits through interest rate spreads, but recent trends indicate pressure on net interest margins due to rising funding costs and intense competition, encouraging revenue diversification from non-interest sources such as service fees and investment services (Deloitte, 2025). From a risk perspective, banks face the challenge of managing the gap between Third Party Funds (TPF) and credit disbursement, which can give rise to liquidity and credit risks. Adequate liquidity, such as a liquid asset-to-TPF ratio above the minimum threshold, helps manage risk prudently. An elevated NPL ratio indicates greater credit risk and compels higher provisioning, thereby compressing profitability; conversely, well governed liquidity risk can contribute positively to firm performance. Liquidity risk's influence on profitability may be transmitted via credit risk functioning as a mediating construct (Ruziqa, 2013).

The 1997–1998 monetary crisis in Indonesia exposed serious weaknesses in the banking sector, such as high leverage, a non-performing loan (NPL) ratio that reached 27% in 1997, and weak regulation and supervision. In response, the state promulgated Law No. 10 of 1998, institutionalizing the CAMEL methodology for bank health assessment, encompassing capital adequacy, asset quality, managerial quality, profitability or earnings, and liquidity. Currently, the latest regulations emphasize the RGEC method, replacing CAMEL or CAMELS, as formalized through Bank Indonesia Regulation No. 13/1/PBI/2011, focusing on four main components: risk profile, good corporate governance, earnings, and capital. The RGEC method is considered more comprehensive and risk-based than CAMEL, and its implementation has been continued by the Financial Services Authority (OJK) through regulations such as POJK No. 4/POJK.03/2016 which requires individual and consolidated bank health assessments using a risk-based bank rating approach, covering various types of risks, governance quality, profitability, and capital adequacy to maintain bank stability and health amidst economic dynamics from 2016 to the present (Juanaristo & Astika, 2022; OJK, 2016).

The 2008 global financial crisis led to significant interest rate cuts to encourage investment and consumption. Bank Indonesia promulgated Regulation No. 13/1/PBI/2011, which institutionalizes RGEC reporting for bank soundness, covering risk profile, good corporate governance, earnings, and capital, thereby superseding the CAMEL regime set forth in Regulation No. 6/10/PBI/2004. This change reflects a shift towards a more risk-sensitive and governance-focused framework to capture post-crisis financial risk dynamics. Furthermore, the development of global digital banking has presented new challenges related to profitability and business stability; although digital banks benefit from lower operating costs and broad customer reach through

technology, they often face profitability pressures due to high investment in technological infrastructure, intense competition, and cybersecurity risks. Studies on banking digitalization in Indonesia show that digital transformation can improve operational efficiency and accessibility, thereby boosting profitability, but still requires strategic management of technology investments and mitigation of cybersecurity threats to maintain long-term business stability (Megananda & Afrizal, 2025).

Bank Jago, Bank Amar, Allo Bank, and Bank Neo Commerce constitute digital banking institutions that are listed on the Indonesia Stock Exchange and subject to regulatory oversight by the Financial Services Authority of Indonesia (OJK). By deploying technological solutions, they facilitate broader inclusion in the financial system and enhance the efficiency of service provision. Despite facing challenges typical of the digital banking sector, such as pressures on profitability and operational stability, their financial performance shows a positive trend. In the first half of 2025, Bank Jago recorded a 154% year-on-year increase in net profit, accompanied by a 51% growth in Third Party Funds and a 37% increase in credit distribution, with an NPL of only 0.3% (Bisnis.com, 2025). Bank Amar posted a 29% increase in profit through April 2025 (Kontan.id, 2025), Allo Bank recorded moderate profit growth with a digital-first hybrid business model, while Bank Neo Commerce turned profitable thanks to cost efficiencies despite facing pressure on interest income (CNBC, 2025). Using the RGEC approach that spans risk profile, governance, profitability, and capitalization, the investigation produces a holistic evaluation of the digital banks and illuminates their contribution to sectoral transformation and macroeconomic expansion enabled by digital innovation.

LITERATURE REVIEW

Digital Bank

A digital bank refers to an online only financial intermediary whose service delivery occurs through digital platforms, including mobile applications and websites, thereby supplanting the branch-based model with remote and platform enabled modes of interaction. Through the migration of traditional banking functions to digital platforms, accessibility, practicality, and efficiency are enhanced. Clients can perform account administration, transactional activities, loan application processes, and bill payments continuously and ubiquitously, thereby obviating the need for branch-based interactions. This banking model reduces operational costs by eliminating the need for physical branches and simplifying processes through automation and digital technology. Thus, digital banks are able to provide faster, more personalized, and more engaging services to technology-savvy customers who prioritize digital-based financial experiences (SDK.Finance, 2025).

Financial Report

Financial statements constitute a comprehensive representation of corporate activity and financial condition over a specified horizon, commonly quarterly or annual. The principal schedules are: the balance sheet, which

enumerates assets, liabilities, and owners' equity at the measurement date; the income statement, which reports revenue, expenditure, and period profit or loss; and the cash flow statement, which classifies cash movements into operating, investing, and financing categories. In addition, a statement of changes in equity and detailed notes frequently appear, providing policy disclosures and contextual financial explanations. These statements are crucial for investors, management, and regulators in assessing financial health, supporting decision-making, and understanding overall business performance (Stripe, 2024; Hash Micro, 2024)

Bank Health

Bank health is the composite state of a banking institution's stability, assessed through metrics spanning financial performance, risk profiling, profitability, capital adequacy, and ancillary financial measures. Maintaining bank health is crucial to ensure liquidity, enabling the bank to meet its obligations and maintain public trust. Applying a holistic methodology such as RGEC that spans risk profiling, governance, profitability, and capitalization, institutions are subsequently ranked into tiers of very healthy, healthy, moderately healthy, or less healthy. Maintaining good bank health is not only crucial for the bank's survival but also to prevent risks to other stakeholders and the financial system as a whole. Key evaluative dimensions typically encompass the nonperforming loan ratio, capital adequacy ratio, cash ratio, and a suite of profitability indicators; in aggregate, these measures characterize the institution's operational safety and efficiency (Bank Indonesia, 2011; Setiawan & Budiwitjaksono, 2024).

RGEC Factor

Bank Indonesia's 2011 policy package, comprising Circular Letter No. 13/24/DPNP and Regulation No. 13/1/PBI/2011 and coming into force in January 2012, supplanted the former CAMELS based assessment with the RGEC framework. The RGEC construct encompasses risk profile, good corporate governance, earnings, and capital. Its adoption was motivated in part by the primacy of a risk based bank rating, which facilitates earlier as well as more accurate diagnosis of institutional vulnerabilities. The Risk Profile component assesses the inherent risk and the quality of risk management implementation across various risk types, such as credit, market, liquidity, operational, legal, strategic, presence, and reputational risks, which are crucial for maintaining bank stability (Bank Indonesia, 2011; Limanto & Yunita, 2023).

Within the RGEC methodology, the assessment of banking soundness is structured around these components:

1) Risk Profile (R) Factor:

Pursuant to OJK regulation, banking activities are exposed to eight risk classes: credit, market, liquidity, operational, legal, strategic, compliance, and reputational. As the Risk Profile dimension is proxied solely by credit and liquidity, the analysis is delimited to these two constructs.

$$LDR = \frac{\text{Total Credit}}{\text{third-party funds}} \times 100\%$$

Credit risk, for which the nonperforming loan (NPL) ratio serves as a frequent proxy, denotes the bank's vulnerability to loss caused by a borrower or counterparty that does not honor agreed payment commitments (Bank Indonesia, 2011). The ratio is defined as total credit extended relative to credit identified as problematic. Problematic credit encompasses exposures to nonbank third parties that are categorized as substandard, doubtful, or default. Accordingly, the loan portfolio cannot be presumed entirely performing.

$$NPL = \frac{\text{Non-Performing Loans}}{\text{Total Credits}} \times 100\%$$

Liquidity risk denotes the possibility that maturing liabilities cannot be satisfied from internal cash generation or from readily marketable secured assets, absent detrimental consequences for the bank's operations or financial position. The standard metric is the Loan to Deposit Ratio, defined as total loans divided by third party funds, including time deposits, savings, and checking accounts.

2) Good Corporate Government (G) Factor:

Good corporate governance denotes the institutional framework of rules, practices, and control mechanisms through which corporate operations are guided and monitored, grounded in the principles of accountability, transparency, fairness, responsibility, and independence (PWC, 2025). These principles serve to uphold ethical behavior, ensure regulatory compliance, and strengthen stakeholder trust (OECD, 2023).

In the banking context, GCG serves as a crucial foundation, providing a framework for ethics and accountability. Its implementation contributes to bank health by increasing transparency and public trust, although bank health is also significantly influenced by financial ratios and risk management (Mukti & Rahmawati, 2022).

3) Earning (E) Factor:

$$ROA = \left(\frac{\text{Gross Profit}}{\text{Average Total Asstes}} \right) \times 100\%$$

The earning factor is used to assess how effectively management operates a business in generating profits. The lower this ratio, the less competent the bank's management is in utilizing assets to increase revenue or reduce operating costs. Return on Assets represents a measure of bank performance that integrates asset use efficiency and earning capacity. Formally, it is expressed as the ratio of net profit to average total assets, thereby indicating the degree of asset turnover and the institution's ability to produce profits. An elevated ROA is interpreted as superior performance due to more rapid asset deployment and enhanced profitability ((Puspitasari et al., 2021; Sari & Fauzan, 2025).

$$ROE = \left(\frac{\text{Net Profit}}{\text{Total Credits}} \right) \times 100\%$$

Return on Equity denotes the efficiency with which a banking institution generates earnings from shareholders invested equity, as reflected by the ratio of net income to total equity. A higher ROE reflects stronger profitability and

effective use of equity in creating value for investors (Harvard Business School, 2025).

$$\text{NIM} = \frac{\text{Net Interest Income}}{\text{Average of Total Product Asset}} \times 100\%$$

Net interest income, defined as the excess of interest income over interest expense, functions as a measure of the earning capacity tied to the bank's portfolio of interest yielding assets. The Net Interest Margin (NIM) ratio evaluates how effectively a bank earns income from lending, relative to its funding costs known as the interest spread. Since banks rely heavily on interest income, operating by extending credit to deficit economic units, NIM reflects the bank's profitability after deducting funding costs. A decline in the cost of funds, defined as the interest expense on borrowed liabilities, tends to elevate the net interest margin and thereby enhance overall profitability (Federal Reserve, 2024).

$$\text{BOPO} = \frac{\text{Operational Expense}}{\text{Operational Income}} \times 100\%$$

The BOPO (Bank Operational Efficiency Ratio) assesses a bank's operational effectiveness by comparing operating expenses to operating income. Operating income typically includes interest earned from customers, while operating expenses refer to interest paid to depositors. A lower BOPO ratio implies that the bank operates more efficiently and is in better financial health (Kundu et al., 2023).

4) Capital (C) Factor:

$$\text{CAR} = \frac{\text{Capital}}{\text{Risk Weight Assets}} \times 100\%$$

Capital represents the institution's loss absorbing and obligation fulfilling capacity, with the Capital Adequacy Ratio functioning as a central metric associated with the risk profile. The design of capital management practices is additionally conditioned by organizational complexity and the range of business lines. CAR measures the extent to which a bank's capital supports its risk-weighted assets (loans, securities, investments, interbank exposures) and reflects reliance on both internal capital and external funding sources (e.g., deposits, borrowing) (Juanaristo & Astika, 2022).

METHODOLOGY

The population in this study is the banking industry in Indonesia, while the sample used includes four digital banks, namely Bank Amar, Bank Jago, Allo Bank, and Bank Neo Commerce during the period of 2019–2024 using published financial reports. The empirical analysis relies on secondary evidence drawn from the audited financial statements of four digital banks for the interval from 2019 to 2024, as recognized by the Financial Services Authority. Bank soundness is appraised under the RGEC construct. Specifically, the risk profile dimension employs NPL and LDR, governance is proxied by the GCG composite in accordance with Bank Indonesia provisions, profitability is characterized by ROA, ROE, NIM, and BOPO, and capital adequacy is indicated by CAR. All computations reference the same financial statement set, and the research

protocol is aligned with Bank Indonesia regulations governing RGEC based health assessment.

Risk-Based Bank Rating (RBBR)

Bank Indonesia's Circular Letter (SE) No. 13/24/DPNP, dated October 25, 2011, constitutes a complete reference for the computation procedures under RGEC in relation to evaluating the health of commercial banking institutions (Tyas & Ubaidillah, 2022). As an implementing reference to Regulation No. 13/1/PBI/2011, the circular mandates the use of a risk based bank rating for self evaluation by commercial banks, undertaken individually and on a consolidated footing, to appraise institutional soundness. The framework encompasses capitalization, profitability, risk profiling, and good corporate governance.

Risk Profile (R) Factor

Table 1. Assessment Matrix of Risk Profile Factor. Non-Performing Loan (LDR) and Loan to Deposit Ratio (LDR)

Rank	Explanation	NPL Criteria	LDR Criteria
1	Very healthy	$NPL < 2\%$	$LDR < 75\%$
2	Healthy	$2\% \leq NPL < 5\%$	$75\% < LDR \leq 85\%$
3	Pretty healthy	$5\% \leq NPL < 8\%$	$85\% < LDR \leq 100\%$
4	Unwell	$8\% \leq NPL < 11\%$	$100\% < LDR \leq 120\%$
5	Not Healthy	$NPL \geq 11\%$	$LDR > 120\%$

Source: Circular Letter of Bank Indonesia No. 13/24/DPNP

Good Corporate Governance (G) Factor

Table 2. Assessment Matrix of Good Corporate Governance Factor

Rank	Explanation	GCG Criteria
1	Very healthy	$GCG \leq 1,5$
2	Healthy	$1.5 < GCG \leq 2.5$
3	Pretty healthy	$2.5 < GCG \leq 3.5$
4	Unwell	$3.5 < GCG \leq 4.5$
5	Not Healthy	$4.5 < GCG \leq 5$

Source: Regulation of OJK Number 4/POJK.03/2016 & Attachment from BI DIR SK No.

Earning (E) Factor

Table 3. Assessment Matrix of Earning Factor. Rasio Return on Asset (ROA), Return on Equity (ROE), Net Interest Margin (NIM), and Operational Expense-Operational Income (BOPO)

Rank	ROA Criteria	ROE Criteria	NIM Criteria	BOPO Criteria
1	$ROA > 1.5\%$	$ROE > 20\%$	$NIM > 3\%$	$BOPO \leq 83\%$
2	$1.25\% < ROA \leq 1.5\%$	$12.5\% < ROE \leq 20\%$	$2\% < NIM \leq 3\%$	$83\% < BOPO \leq 85\%$
3	$0.5\% < ROA \leq 1.25\%$	$5\% < ROE \leq 12.5\%$	$1.5\% < NIM \leq 2\%$	$85\% < BOPO \leq 87\%$
4	$0\% < ROA \leq 0.5\%$	$0\% < ROE \leq 5\%$	$1\% < NIM \leq 1.5\%$	$87\% < BOPO \leq 89\%$
5	$ROA \leq 0\%$	$ROE > 0\%$	$NIM \leq 1\%$	$BOPO > 89\%$

Source: Circular Letter of Bank Indonesia No. 13/24/DPNP

Capital (C) Factor

Table 4. Assessment Matrix of Capital Factor. Capital Adequacy Ratio (CAR)

Rank	Explanation	CAR Criteria
1	Very healthy	$CAR \geq 12\%$
2	Healthy	$9\% \leq CAR < 12\%$
3	Pretty healthy	$8\% \leq CAR < 9\%$
4	Unwell	$6\% < CAR < 8\%$
5	Not Healthy	$CAR \leq 6\%$

Source: Circular Letter of Bank Indonesia No. 13/24/DPNP

RESULT AND DISCUSSION

Risk Profile (R) Factor

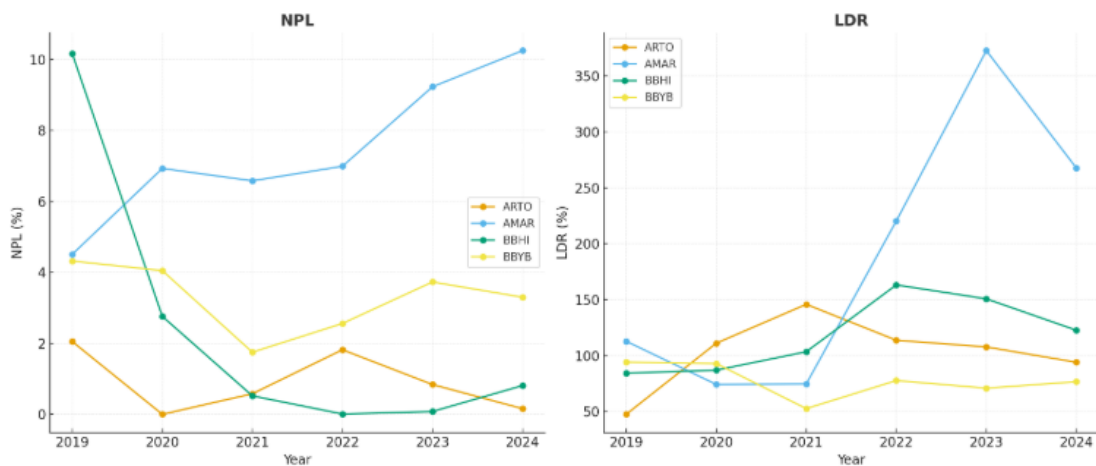


Figure 1. NPL and LDR of Indonesian Digital Banking 2019-2024 Period

Drawing on the depicted data, developments in the nonperforming loan (NPL) ratios across the four digital banks are heterogeneous rather than uniform. ARTO began 2019 with an NPL of 2.05% and managed to consistently reduce it to just 0.16% in 2024, reflecting improved credit quality and sound risk management. Conversely, AMAR experienced a significant increase from 4.51% in 2019 to 10.25% in 2024, indicating challenges in maintaining credit quality, especially in the consumption and investment sectors. BBHI, which initially had the highest NPL at 10.16% in 2019, managed to drastically improve to below 1% in 2022–2024, indicating effective credit restructuring. BBYB shows fluctuations, from 4.32% in 2019 down to 1.75% in 2021, but rises again in 2023 to 3.73% and slightly down to 3.30% in 2024, indicating a period of increased risk after the initial improvement.

With respect to the LDR, ARTO increased from 47.54% in 2019 to 145.86% in 2021 and then declined to 94.08% in 2024. This trajectory is consistent with a phase of credit expansion that was later offset by the consolidation of liquidity. AMAR showed an extreme pattern, dropping to 74.70% in 2021 but soaring drastically to 373.61% in 2023 before declining to 267.68% in 2024, indicating aggressive lending that could potentially increase liquidity risk. BBHI increased steadily from 84.30% in 2019 to 163.19% in 2022, then declining to 122.69% in

2024, reflecting measured but still high credit expansion. BBYB is relatively conservative, with an LDR in the safe range of 90% at the start of the period, which dropped to 52.63% in 2021, then stabilized in the 70–77% range until 2024, indicating healthy liquidity and a prudent lending policy.

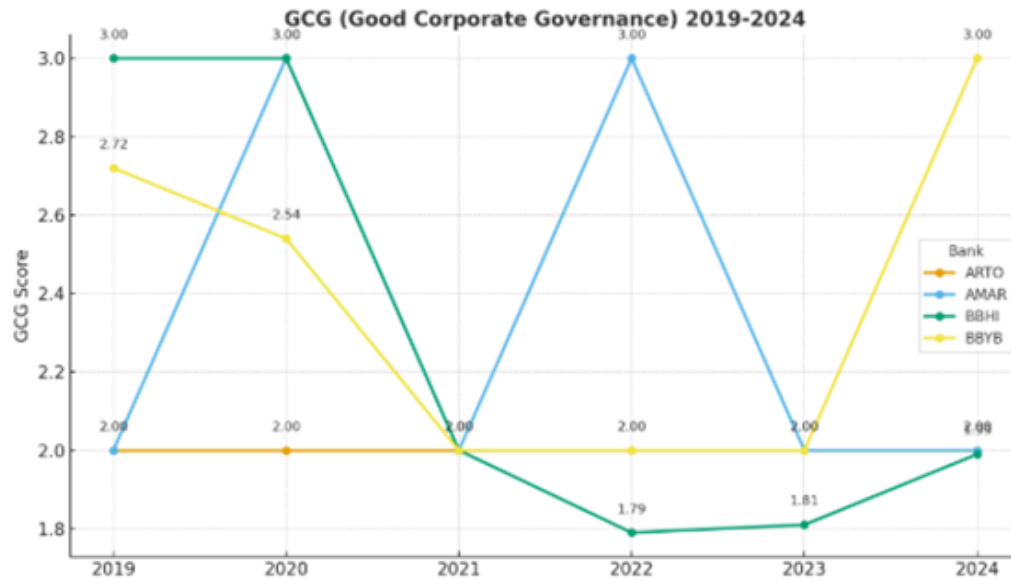


Figure 2. GCG of Indonesian Digital Banking 2019-2024 Period

Good Corporate Governance (G) Factor

Drawing on the displayed data, the evolution of good corporate governance in the four digital banks is characterized by relative stability and low amplitude variation. ARTO consistently maintained a score of 2.00 throughout 2019–2024, indicating good and stable governance implementation without significant changes in the assessment. AMAR started with a score of 2.00 in 2019, rose to 3.00 in 2020, then returned to 2.00 in 2021, jumped to 3.00 in 2022, and dropped again to 2.00 in 2023–2024. These fluctuations indicate changes in governance quality, likely influenced by improvements or challenges in risk management and oversight functions. BBHI had the highest initial score of 3.00 in 2019–2020, but gradually decreased to 2.00 in 2021, 1.79 in 2022, 1.81 in 2023, and a slight increase to 1.99 in 2024, indicating an improvement in governance quality at the end of the period after the previous decline. BBYB’s GCG score registered 2.72 in 2019, moved down to 2.54 in 2020, and remained at 2.00 across 2021 to 2023, before advancing to 3.00 in 2024. This trajectory evidences a substantive enhancement in GCG implementation at the period’s end. Overall, the majority of banks-maintained scores in the “fairly healthy” to “healthy” category according to the assessment matrix, with indications that the score changes reflect the dynamics of internal improvements, strategic adjustments, and responses to risk management and compliance challenges.

Earning Factor

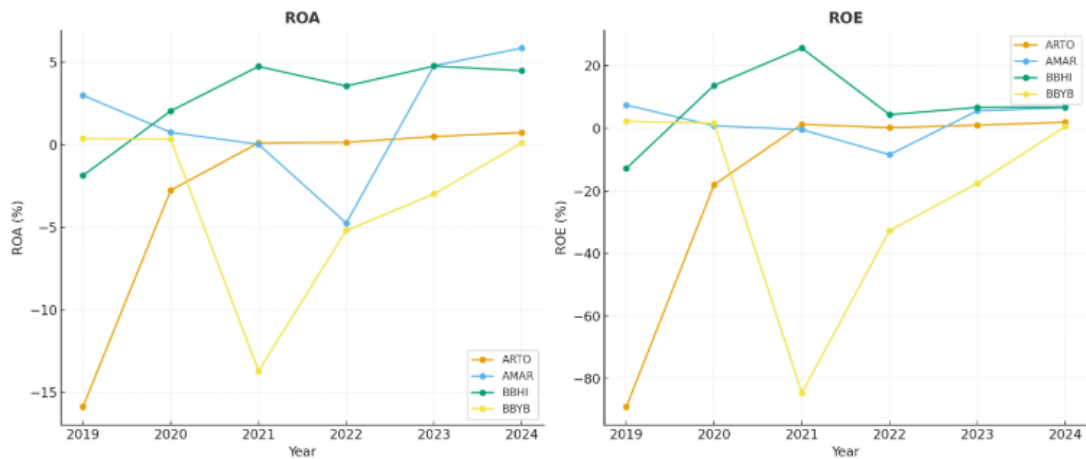


Figure 3. ROA and ROE of Indonesian Digital Banking 2019-2024 Period

Drawing on the presented data, cross bank trajectories in ROA and ROE are heterogeneous, underscoring substantial divergence in profitability performance. In terms of ROA, ARTO began 2019 with a negative performance of -15.89% and gradually improved to 0.73% in 2024, although it remains below the healthy category according to the BI assessment matrix. AMAR had a positive ROA from the start, namely 2.99% in 2019, but it dropped to negative in 2021 (-4.75%) and 2022 (-4.78%) before recovering to 5.85% in 2024, indicating a strong recovery in profitability. BBHI recorded a negative ROA in 2019 (-1.87%), then turned positive in 2020 (2.04%) and continued to increase to 4.48% in 2024, demonstrating the effective use of assets to generate profits. Meanwhile, BBYB started with a low ROA of 0.37% in 2019, plummeted to -13.71% in 2020, then gradually recovered to 0.10% in 2024, although it is still in the low range.

In terms of ROE, ARTO recorded -89.03% in 2019 and -18.03% in 2020, then improving to 1.95% in 2024, but remains in the unhealthy category because it has not yet passed the 5% threshold. AMAR was stable in the healthy range in 2019–2020 (7.45% and 0.81%), but ROE plummeted to negative in 2021–2022 due to losses, before recovering significantly to 6.80% in 2024. BBHI’s trajectory shows substantial strengthening: from negative 12.83 percent in 2019 it reached 25.64 percent in 2021 and subsequently stabilized within the 6 to 7 percent interval during 2023 to 2024, maintaining a classification of fairly healthy. BBYB experienced the worst performance, with an ROE of -84.61% in 2020 and -32.67% in 2022, before slightly improving to 0.59% in 2024, but still far from healthy criteria. Overall, BBHI and AMAR stood out in their profitability recovery, while ARTO and BBYB showed improvement but had not yet reached optimal levels.

Capital (C) Factor

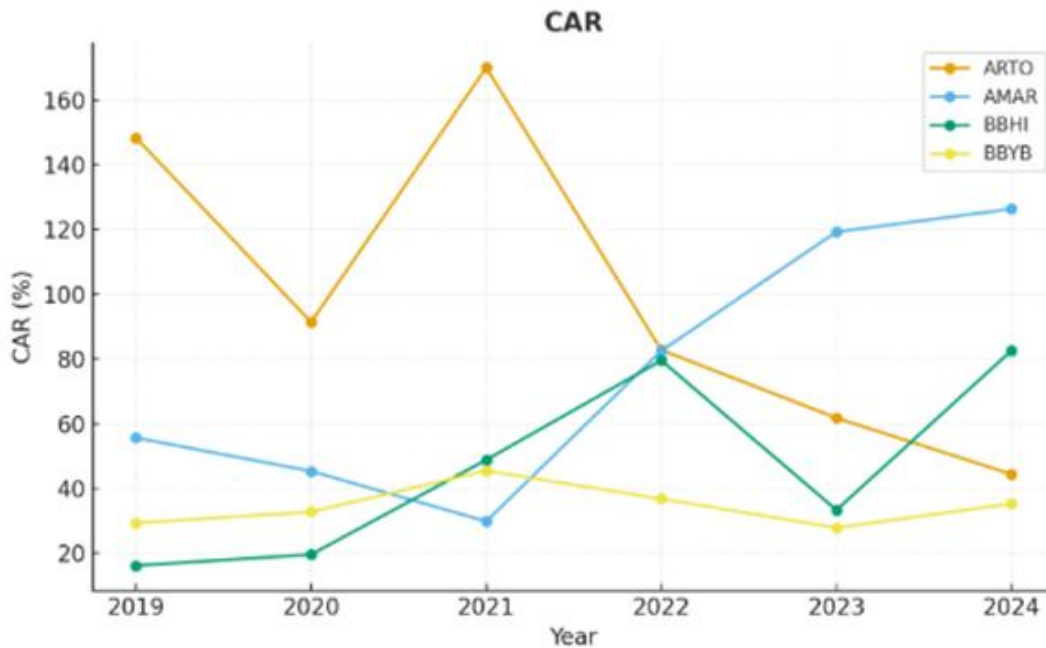


Figure 4. CAR of Indonesian Digital Banking 2019-2024 Period

Drawing on the displayed data, the four institutions' CAR values largely satisfy Bank Indonesia's very healthy benchmark (CAR \geq 12%), while exhibiting heterogeneous trend patterns across banks. ARTO had a very high CAR at the beginning of the period, at 148.28% in 2019, but experienced a gradual decline to 44.40% in 2024. Despite the decline, this value remains well above the minimum threshold, reflecting very strong capital capacity. AMAR started at 55.64% in 2019, dropped to 29.85% in 2021, but then increased significantly to 126.31% in 2024, indicating significant capital strengthening by the end of the period. BBHI recorded a CAR of 16.20% in 2019 and continued to increase to 83.35% in 2023 before declining slightly to 82.58% in 2024, reflecting consistent capital growth. Meanwhile, BBYB started at 29.35% in 2019, reached 55.49% in 2021, then dropped to 27.86% in 2023 before slightly increasing to 35.30% in 2024. Overall, all four banks had very healthy CARs throughout the observation period, demonstrating their ability to maintain capital resilience to anticipate credit, market, and operational risks.

CONCLUSIONS AND RECOMMENDATIONS

Empirical evidence from the study suggests that, under the RGEC framework, the four observed digital banks attain a comparatively favorable health status. Capital Adequacy Ratio (CAR) was in the very healthy category for all banks, reflecting a strong ability to absorb potential losses. Risk profile factors showed improvements in credit quality, particularly at Bank Jago and Allo Bank, although Bank Amar still faced challenges in maintaining NPL and LDR at ideal levels. The trajectory of GCG indicators exhibits stability or incremental improvement, implying sustained adherence to good governance norms and procedures. In terms of profitability, BBHI and AMAR showed significant

recovery in ROA and ROE, while ARTO and BBYB still needed to improve the effectiveness of asset utilization to generate profits. Overall, banking digitalization has contributed positively to operational efficiency and the growth of financial inclusion, but requires a risk management strategy and sustainable technology investment.

Bank management is advised to continue strengthening risk management, particularly in maintaining credit quality and liquidity to avoid impacting profitability. Operational efficiency efforts through digitalization must be balanced with technological risk mitigation and cybersecurity. It is advisable that future inquiry incorporate samples of digital banks drawn from several national contexts to permit cross country analysis, and that it utilizes longitudinal observation to identify the enduring influence of digital transformation on institutional health and systemic stability.

ADVANCED RESEARCH

Every study has limitations. This study focused solely on digital banks operating in Indonesia, so the results may not be globally generalizable. Differences in regulatory environments, levels of financial inclusion, market maturity, and customer behavior across countries can result in variations in digital bank performance. Future research should broaden its scope by including digital banks from various countries to enable cross-country comparisons and provide a more comprehensive understanding of the influence of regulatory frameworks, technology adoption, and economic conditions on digital banking performance. Furthermore, longitudinal research could be conducted to observe the long-term impact of digital transformation on bank health and financial stability.

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