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A Comparative Analysis of the Financial Health of State-Owned Banks Using the RGEC and CAMELS Methods, FY 2020–2025

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Abstract

This study aims to analyze and compare the financial health of state-owned banks (BUMN), namely PT Bank Negara Indonesia (Persero) Tbk, PT Bank Rakyat Indonesia (Persero) Tbk, and PT Bank Mandiri (Persero) Tbk using the RGEC and CAMELS methods during the period 2020–2025. This research employs a quantitative approach with a descriptive comparative method. The data used are secondary data in the form of quarterly financial statements obtained from the official publications of each bank. The data analysis techniques include financial ratio analysis, normality test, Kruskal-Wallis test, and Wilcoxon Signed Rank Test using IBM SPSS Statistics 25. The results show that there are significant differences in bank health levels based on the RGEC method with a significance value of 0.002, where Bank Mandiri has the best performance. Meanwhile, based on the CAMELS method, there are also significant differences with a significance value of 0.000, where Bank BNI shows the best performance. Additionally, the Wilcoxon test results indicate a significant difference between the RGEC and CAMELS methods with a significance value of 0.000, suggesting that the RGEC method tends to produce higher assessment results compared to CAMELS. This difference stems from the distinct approaches employed: RGEC emphasizes risk-based and governance aspects, whereas CAMELS focuses more on financial ratio analysis. This study concludes that the simultaneous use of both methods can provide a more comprehensive and accurate assessment of bank health levels.

Keywords: Bank Health, RGEC, CAMELS, State-Owned Banks, Financial Performance.

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INTRODUCTION

The banking sector plays a crucial role in supporting national economic growth and stability. Banks serve as trusted financial institutions where the public deposits their funds safely. To maintain public trust, banks must sustain and improve their performance (Ardiyanti et al., 2023). Therefore, a bank's health condition is a crucial aspect to monitor, as a healthy bank can maintain public trust and support the overall stability of the financial system. A bank's health level reflects its ability to manage risks, generate profits, and maintain capital adequacy. Hariyono and Untu (2021) state that numerous variables can be used to assess a bank's health and determine whether it falls within a predetermined category.

Approaches to assessing bank health continue to evolve, one of which is through the Risk-Based Bank Rating (RBBR) or RGEC method. This method evaluates bank health based on four main aspects: risk profile, good corporate governance, earnings, and capital. The risk profile aspect is used to assess the level of risk faced by the bank, which in this study focuses on credit risk and liquidity risk. Risk-based bank health assessments are conducted to predict the likelihood of these risks occurring (Sari & Tasman, 2020). Credit risk is measured using the Non-Performing Loan (NPL) ratio, while liquidity risk is measured using the Loan-to-Deposit Ratio (LDR). The good corporate governance (GCG) aspect reflects the quality of corporate governance, which in this study is measured using a composite GCG score derived from each bank's self-assessment results. The earnings aspect is used to assess a bank's ability to generate profits, measured by Return on Assets (ROA) and Net Interest Margin (NIM). Meanwhile, the capital aspect is used to measure capital adequacy in bearing risks, proxied by the Capital Adequacy Ratio (CAR).

In addition to the RGEC method, the CAMELS method is also widely used to assess a bank's financial health. This method evaluates a bank's condition based on six key aspects: capital, asset quality, management, earnings, liquidity, and sensitivity to market risk. In this study, the CAMELS assessment was conducted using several financial indicators: the Capital Adequacy Ratio (CAR) to measure capital adequacy, Non-Performing Loans (NPL) to assess asset quality, Net Profit Margin (NPM) as a proxy for management, Return on Assets (ROA) to measure the bank's ability to generate profits, Loan to Deposit Ratio (LDR) to assess the bank's liquidity level, and Net Foreign Exchange Position (NFXP) to measure sensitivity to market risk. The CAMELS method is considered capable of providing a quantitative overview of a bank's fundamental condition and financial performance, as well as enabling objective comparisons of performance

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across periods (Hapsari et al., 2024). From the perspective of signaling theory, information regarding a bank's financial performance and health level serves as a crucial signal conveyed to external parties, such as investors and the public. A bank with good health will send a positive signal, thereby enhancing public trust and interest. Conversely, differences in bank health assessments can lead to varying interpretations of the bank's condition.

State-Owned Enterprises (SOEs) play a strategic role in the national banking system because they are not only profit-oriented but also support government policies in economic development. Banks such as PT Bank Negara Indonesia (Persero) Tbk, PT Bank Rakyat Indonesia (Persero) Tbk, and PT Bank Mandiri (Persero) Tbk possess substantial assets and extensive networks, thereby making significant contributions to credit disbursement and economic growth. In recent years, the economic landscape has undergone significant dynamics, particularly from the onset of the pandemic through the recovery phase. The 2020–2025 period is particularly interesting to study as it reflects a phase of both economic pressure and recovery that impacts banking performance, particularly credit quality, liquidity, and profitability. Most previous studies still rely on annual data and employ only a single evaluation method, thus failing to capture the detailed dynamics of bank performance or provide a comprehensive comparison across methods. Yet, banking performance is dynamic and can change in the short term. Therefore, this study uses quarterly financial report data from the 2020–2025 period to provide a more detailed and accurate picture of the development of bank performance over time.

Based on the above, this study aims to analyze and compare the financial health levels of state-owned enterprises (SOEs), namely PT Bank Negara Indonesia (Persero) Tbk, PT Bank Rakyat Indonesia (Persero) Tbk, and PT Bank Mandiri (Persero) Tbk, using the RGEC and CAMELS methods during the 2020–2025 period based on quarterly financial statements. Additionally, this study aims to identify differences in health levels among the banks, determine variations in assessment results between the two methods employed, and identify the bank with the best health level during the study period. The findings of this study are expected to provide more comprehensive information regarding the health condition of the banking sector in Indonesia and serve as a basis for stakeholders in making investment decisions and evaluating bank performance.

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LITERATURE REVIEW

1. Signaling Theory

Signaling theory is one of the foundational theories that aids in understanding financial management. This theory was first proposed by Spece (1973) and further developed by Ross (1977). A signal can generally be defined as a message sent by a company (management) to external parties (investors). These signals reflect the company's condition and contain information content that can influence market assessments. According to Erawati et al. (2022), when a company's financial condition is favorable, it sends a positive signal to investors; conversely, when the reported financial condition is unfavorable, the market responds negatively. Information regarding a company's condition is crucial for investors, as the signals provided serve as a guide for investors to consider when investing capital in a company (Purwaningsih & Siddki, 2021).

2. Banks

Banks are financial institutions whose primary function is to act as intermediaries between parties with excess funds and those in need of funds. Banks collect funds from the public in the form of deposits and channel them back out in the form of loans or other financing. Additionally, banks provide various financial services to support economic activities. The strategic role of banks in the economic system makes the stability and soundness of banks a matter of utmost importance to maintain. According to the Kamus Besar Bahasa Indonesia (KBBI), a bank is an institution that collects and channels public funds, primarily through the provision of loans as well as various financial transaction services and the circulation of money (Pratikto et al., 2021).

3. Bank Soundness

Bank's financial health reflects its ability to operate normally and fulfill all obligations in accordance with banking regulations. Banks are required to assess their own financial health and report it to the Financial Services Authority. In accordance with POJK No. 4 of 2016, Article 3, Paragraph 1, banks are required to conduct this self-assessment at least every six months and at other times deemed necessary. (Wardhana, 2024). A bank's financial health is measured by evaluating its assets, capital, management, liquidity, and market sensitivity. The composite score for each financial ratio within the respective components that determine the composite ranking will be calculated as follows:

a. Rank 1 = Each checkmark multiplied by 5
b. Rank 2 = Each checkmark multiplied by 4
c. Rank 3 = Each checkmark is multiplied by 3

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d. Rank 4 = Each checkmark is multiplied by 2
e. Rank 5 = Each checkmark is multiplied by 1

The percentages used to determine the overall composite ranking of the components are as follows:

Table 1. Composite Ranking Weighting

Weight %	Composite Rank	Health Category
86 – 100	PK-1	**Very Healthy**
71 – 85	PK-2	**Healthy**
61–70	PK-3	**Fairly Healthy**
41–60	PK-4	**Less Healthy**
<40	**PK-5**	**Unhealthy**

Source: Bank Indonesia Regulation No. 13/1/PBI/2011 (adapted)

Regarding bank health ratings based on Bank Indonesia Regulation Article 9 No. 13/1/PBI/2011, the rating for each factor is determined as follows:

a. Composite Rating 1 (PK-1) reflects a bank's generally very sound condition, indicating it is highly capable of withstanding significant negative impacts from changes in business conditions and other external factors.
b. Composite Rating 2 (PK-2) reflects a bank's generally healthy condition, indicating it is capable of withstanding significant negative impacts from changes in business conditions and other external factors.
c. Composite Rating 3 (PK-3) reflects the Bank's generally fairly sound condition, indicating it is fairly capable of withstanding significant negative impacts from changes in business conditions and other external factors.
d. Composite Rating 4 (CR-4) indicates that the Bank is generally in a less healthy condition and is therefore deemed less capable of withstanding significant negative impacts from changes in business conditions and other external factors.
e. Composite Rating 5 (PK-5) reflects a Bank's generally unhealthy condition, indicating it is deemed unable to withstand significant negative impacts from changes in business conditions and other external factors.

4. REGC Method

In accordance with Bank Indonesia Regulation No. 13/1/PBI/2011 on the Assessment of Commercial Bank Health Levels, banks are required to conduct a risk-

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based assessment of their health levels using the REGC method, which consists of several components, namely:

a. Risk Profile

An assessment of the level of risk inherent in the bank's activities and the quality of risk management implementation in its operations. This study focuses on two primary risks: credit risk, measured using the Non-Performing Loan (NPL) ratio, and liquidity risk, measured using the Loan-to-Deposit Ratio (LDR). The NPL indicates the extent of loans experiencing repayment issues, while the LDR measures the bank's ability to meet its obligations or liabilities using its assets.

b. Good Corporate Governance

Good Corporate Governance (GCG) is a corporate governance system that regulates the relationships between management, shareholders, and stakeholders to improve corporate performance and value. In the banking sector, GCG aims to ensure that bank operations are conducted in a transparent, accountable, responsible, independent, and fair manner. The implementation of corporate governance is crucial as it enhances corporate value by strengthening financial performance and reducing the risk of irresponsible decision-making (Abdillah & Anjani, 2025). In accordance with the provisions established by the Financial Services Authority through Financial Services Authority Regulation No. 4/POJK.03/2016, GCG assessments are conducted through self-assessment by each bank.

c. Earnings (Profitability)

Profitability analysis is conducted using several components, namely Return on Assets (ROA) and Net Interest Margin (NIM). ROA is used to assess a company's ability to generate profit from the use of its assets. Meanwhile, NIM is used to measure the bank's management's ability to manage its earning assets to generate net interest income.

d. Capital

Capital encompasses the quality and quantity of capital that meets Bank Indonesia's requirements regarding the obligation to provide minimum capital. The objective is to mitigate and prevent risks arising from capital-related issues (Pratikto & Afiq, 2021). The risk-adjusted capital adequacy level is measured using the Capital Adequacy Ratio (CAR).

5. CAMEL Method

Bank Indonesia, through regulations such as Bank Indonesia Circular Letter No. 13/24/DPNP of 2011 on the Assessment of Commercial Bank Health, emphasizes that

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the application of the CAMEL method aims to provide a comprehensive overview of a bank's capital adequacy, asset management quality, management effectiveness, profit-generating capacity, and liquidity levels. The CAMEL method comprehensively assesses a bank's health through six key aspects: capital, asset quality, management, earnings, liquidity, and sensitivity to market risk.

a. Capital

The capital aspect assesses the extent to which a bank's capital can cover risks arising from all business activities. The indicator used is the ratio of the bank's capital to risk-weighted assets. A high Capital Adequacy Ratio (CAR) indicates that the bank has an adequate capital buffer to absorb potential losses arising from credit, market, and operational risk exposures (Hapsari et al., 2024).

b. Asset Quality

Asset quality reflects a bank's ability to maintain a healthy and low-risk loan portfolio. The ratio used to measure asset quality is the Non-Performing Loan (NPL) ratio, which represents the proportion of non-performing loans to total loans. The lower the NPL ratio, the better the bank's asset quality, as it indicates a low level of non-performing loans.

c. Management

The management aspect reflects a bank's ability to manage operational activities effectively and efficiently. Its assessment relates to the quality of decision-making, planning, operational control, and management's ability to maintain company performance. The management aspect is proxied using the Net Profit Margin (NPM) ratio, which illustrates a bank's ability to generate net profit from operating revenue.

d. Earnings

Earnings (Profitability) is an aspect used to measure a bank's ability to generate sustainable profits. This aspect is assessed using the Return on Assets (ROA) ratio, which indicates the bank's ability to generate profits from all its assets.

e. Sensitivity to Market Risk

Sensitivity to Market Risk is a metric used to measure a bank's ability to manage risks arising from changes in market conditions, such as fluctuations in exchange rates and interest rates. This metric is assessed using the Net Foreign Exchange Position (NFXP) ratio, which indicates the extent of a bank's exposure to foreign exchange rate risk.

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RESEARCH METHOD

1. Research Approach

This study employs a quantitative approach with a descriptive-comparative research design. The quantitative approach is used because the data being analyzed consists of numerical data from bank financial statements, which can be processed through calculations and statistical analysis. The descriptive method is used to depict the condition of a bank's financial health based on indicators within the RGEC and CAMELS frameworks through the presentation of data in tabular form and interpretation. Additionally, the comparative method is used to compare the financial health levels among state-owned enterprises (SOEs), specifically PT Bank Negara Indonesia (Persero) Tbk, PT Bank Rakyat Indonesia (Persero) Tbk, and PT Bank Mandiri (Persero) Tbk. This approach is also used to compare the assessment results between the RGEC and CAMELS methods to identify any differences in the assessment results of the banks' financial health.

2. Type and Sources of Data

The type of data used in this study is secondary data. Secondary data is data not collected directly from the research subjects but obtained from pre-existing sources, such as documents, reports, archives, books, scientific articles, or official databases (Fitriani, 2021). In this study, the secondary data consists of bank financial statements used as the basis for analyzing bank financial health. The data sources in this study were obtained from quarterly financial reports officially published by PT Bank Negara Indonesia (Persero) Tbk, PT Bank Rakyat Indonesia (Persero) Tbk, and PT Bank Mandiri (Persero) Tbk during the 2020–2025 period.The use of quarterly data in this study aims to provide a more detailed and accurate picture of the development of banks' financial performance over time, thereby making the analysis results more comprehensive.

3. Data Collection

The data collection technique in this study uses the documentation method, namely by collecting secondary data in the form of published financial statements. The data was obtained through the official websites of each bank as well as the Indonesia Stock Exchange. The documentation method was carried out by compiling and recording data available in the company's financial statements (Feminda, 2024; Sari, 2021).

4. Operational Definitions of Variables

The operational definitions of variables in this study explain the indicators and measurement methods for each variable used in the RGEC and CAMELS methods. Variables are measured using financial ratios:

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a. Non-Performing Loans (NPL)

NPL is used to measure the level of non-performing loans held by a bank. Non-Performing Loans (NPL) are calculated using the following formula (Astari et al., 2021):

$$PL = \frac{\text{Problem Loans}}{\text{Total Loans}} \times 100\%$$

Table 2. NPL Assessment Criteria

NPL Ratio	Composite Rating	Health Category
< 2%	1	**Very Healthy**
2% ≤ - < 5%	2	**Healthy**
5% ≤ - < 8%	3	**Fairly Healthy**
8% ≤ - < 12%	4	**Less Healthy**
≥ 12%	**5**	**Unhealthy**

Source: Bank Indonesia Regulation No. 13/1/PBI/2011 (Adapted).

b. Loan to Deposit Ratio (LDR)

LDR is used to measure a bank's ability to channel third-party funds in the form of loans. The Loan-to-Deposit Ratio (LDR) is calculated using the following formula (Astari et al., 2021):

$$LDR = \frac{\text{Total Loans}}{\text{Third-Party Funds}} \times 100\%$$

Table 3. LDR Assessment Criteria

LDR Ratio	Composite Rating	Health Category
≤ 75%	1	**Very Healthy**
75% < - ≤ 85%	2	**Healthy**
85% < - ≤ 100%	3	**Fairly Healthy**
100% < - ≤ 120%	4	**Less Healthy**
> 120%	**5**	**Unhealthy**

Source: Bank Indonesia Regulation No. 13/1/PBI/2011 (Adapted).

c. Good Corporate Governance (GCG)

Bank Indonesia Regulation No. 8/4/PBI/2006 stipulates that GCG assessments are conducted through self-assessment by the bank. The results of the self-assessment

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are reported in the annual report and must address the following aspects (Baharuddin, Iskandar, & Siregar (2022)):

1) Duties and responsibilities carried out by the Board of Directors and Commissioners
2) The bank's internal control functions, including the adequacy and practices of committees and operational units
3) The functions of internal and external auditors, as well as the compliance measures implemented
4) Implementation of risk management, including the internal control system
5) Large-scale funding and funding to related parties
6) The Bank's strategic planning
7) Transparent financial and non-financial conditions of the Bank

d. Return on Assets (ROA)

Return on Assets is used to measure a bank's ability to generate profit from its total assets. ROA can be calculated using the following formula (Febrianto & Fitriana, 2020):

$$\text{ROA} = \frac{\text{Profit or Loss Before Tax}}{\text{Total Assets}} \times 100\%$$

Table 4. ROA Assessment Criteria

ROA Ratio	Composite Rating	Health Category
> 1.5%	1	**Very Healthy**
1.25% < - ≤ 1.5%	2	**Healthy**
0.5% < - ≤ 1.25%	3	**Fairly Healthy**
0% < - ≤ 0.5%	4	**Less Healthy**
≤ 0%	**5**	**Unhealthy**

Source: Bank Indonesia Regulation No. 13/1/PBI/2011

e. Net Interest Margin (NIM)

NIM is a ratio that indicates a bank's ability to generate net interest income from earning assets (Hapsari et al., 2025). NIM can be calculated using the following formula (Febrianto & Fitriana, 2020):

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$$NIM = \frac{\text{Net Interest Income}}{\text{Average Earning Assets}} \times 100\%$$

Table 5. NIM Assessment Criteria

NIM Ratio	Composite Rating	Health Category
> 3%	1	**Very Healthy**
2% < - ≤ 3%	2	**Healthy**
1.5% < - ≤ 2%	3	**Fairly Healthy**
1.0% < - ≤ 1.5%	4	**Less Healthy**
≤ 1%	**5**	**Unhealthy**

Source: Financial Services Authority Regulation No. 4/POJK.03/2016 (Adapted).

f. Capital Adequacy Ratio (CAR)

CAR is used to measure a bank's capital adequacy in covering risks. The Capital Adequacy Ratio (CAR) is calculated using the following formula (Maramis, 2019):

$$CAR = \frac{\text{Capital}}{\text{ATMR}} \times 100\%$$

Table 6. CAR Assessment Criteria

CAR Ratio	Composite Rating	Health Category
≥ 12%	1	**Very Healthy**
9% ≤ - < 12%	2	**Healthy**
8% ≤ - < 9%	3	**Fairly Healthy**
6% ≤ - < 8%	4	**Less Healthy**
< 6%	**5**	**Unhealthy**

Source: Bank Indonesia Regulation No. 13/1/PBI/2011 (Processed)

g. Net Profit Margin (NPM)

NPM is used as a proxy to measure management performance in generating profits. This is because management functions, such as risk management, operations, and compliance, collectively influence the level of profit achieved (Ashuri & Hosen, 2022). The use of NPM in this study is also supported by previous research in the CAMELS approach, given that management aspects are qualitative and difficult to measure directly.

$$NPM = \frac{\text{Net Profit After Tax}}{\text{Revenue}} \times 100\%$$

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Table 7. NPM Assessment Criteria

NPM Ratio	Composite Rating	Health Category
> 100%	1	**Very Healthy**
81% ≤ - < 100%	2	**Healthy**
66% ≤ - < 81%	3	**Fairly Healthy**
51% ≤ - < 66%	4	**Less Healthy**
< 51%	**5**	**Unhealthy**

Source: Compiled from previous research based on the CAMELS approach

h. Net Foreign Exchange Position (NFXP)

NFP is used to measure the level of market risk resulting from exchange rate fluctuations. The NFP criteria are adapted from the maximum NFP limit set by Bank Indonesia, which is 20% of capital. The formula for calculating NFP is as follows (Pratikto & Afiq, 2021):

$$NFP = \frac{\text{Difference between Foreign Exchange Assets and Liabilities}}{\text{Total Capital}} \times 100\%$$

Table 8. PDN Evaluation Criteria

ROA Ratio	Composite Rating	Health Category
≤ 10%	1	**Very Healthy**
> 10% - 15%	2	**Healthy**
> 15%–20%	3	**Fairly Healthy**
> 20%–25%	4	**Less Healthy**
> 25%	**5**	**Unhealthy**

Source: Bank Indonesia Regulation No. 5/13/PBI/2003 (Adapted)

5. Data Analysis Technique

The data analysis techniques in this study employ a quantitative approach using descriptive and comparative methods. The analysis was conducted to determine the banks' soundness levels and to compare the assessment results between the RGEC and CAMELS methods. Data processing in this study was performed using IBM SPSS Statistics software version 25. The stages of data analysis in this study are as follows:

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a. RGEC Method

Analysis of bank health levels using the RGEC method was conducted by calculating financial ratios, including Non-Performing Loans (NPL), Loan-to-Deposit Ratio (LDR), Good Corporate Governance (GCG), Return on Assets (ROA), Net Interest Margin (NIM), and Capital Adequacy Ratio (CAR). The RGEC method is used to assess a bank's health based on the aspects of -risk profile, good corporate governance, earnings, and capital (Sari & Tasman, 2020). Subsequently, each ratio is evaluated based on established criteria to obtain a rating, which is then compiled into a composite score to determine the bank's health level.

b. CAMELS Method

Analysis of a bank's health level using the CAMELS method involves calculating the Capital Adequacy Ratio (CAR), Non-Performing Loan (NPL), Net Profit Margin (NPM), Return on Assets (ROA), Loan-to-Deposit Ratio (LDR), and Net Foreign Exchange Position (PDN). The CAMELS method is used to comprehensively assess a bank's health through the aspects of capital, asset quality, management, earnings, liquidity, and sensitivity to market risk (Hapsari et al., 2024). The results of each ratio calculation are then classified into assessment categories and used to determine the bank's health level.

c. Normality Test

A normality test is conducted on the data before it is analyzed according to the research model. The normality test is used to determine whether the data distribution in the variables used follows a normal distribution or not (Kaemana & Wibowo, 2023). The decision criterion in the normality test is that if the obtained significance value is > 0.05, the research data is normally distributed. Conversely, if the obtained significance value is < 0.05, the research data is not normally distributed (Dari et al., 2024).

d. Kruskal-Wallis Test

The Kruskal-Wallis test is a nonparametric statistical test used to test for differences among two or more groups of data that are not normally distributed. This test is used as an alternative to the ANOVA test when the data do not meet the assumption of normality (Enizar, 2023). In this study, the Kruskal-Wallis test was used to determine differences in the health levels of banks across the groups of banks studied. The decision criteria in this study are based on the significance level (Sig). If the significance level is > 0.05, there is no significant difference. Conversely, if the significance level is < 0.05, there is a significant difference (Dari et al., 2024).

e. Wilcoxon Signed-Rank Test

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If the results of the normality test indicate that the data are not normally distributed, hypothesis testing in this study is conducted using a nonparametric statistical test, namely the Wilcoxon Signed Rank Test. The Wilcoxon test is used to test differences between two paired samples; in this case, to compare the results of bank health assessments between the RGEC and CAMELS methods. The basis for decision-making in the Wilcoxon Signed Rank Test is as follows: if the significance value (Asymp. Sig. (2-tailed)) ≥ 0.05, then there is no significant difference, so the null hypothesis (H0) is accepted. Conversely, if the significance value (Asymp. Sig. (2-tailed)) < 0.05, then there is a significant difference, so the null hypothesis (H0) is rejected (Kaemana & Wibowo, 2023).

DISCUSSION

Bank Health Levels Using the RGEC Method

Based on Bank Indonesia Regulation No. 13/1/PBI/2011, the RGEC method is used to assess bank health through four main aspects: Risk Profile, Good Corporate Governance, Earnings, and Capital. Banks are required to conduct self-assessments using a risk-based approach (Risk-Based Bank Rating), both on an individual and consolidated basis. This assessment aims to provide a comprehensive picture of the bank's performance and stability.

Table 9. Results of BNI's RGEC Value Measurement for 2021–2025

Bank	Year	REGC Composite Value			
		Q1	Q2	Q3	**Q4**
BNI	2020	86.67	83.33	80.00	**80.00**
	2021	83.33	83.33	86.67	**86.67**
	2022	86.67	86.67	86.67	**86.67**
	2023	86.67	86.67	86.67	**86.67**
	2024	86.67	90.00	90.00	**90.00**
	2025	**90.00**	**90.00**	**90.00**	**90.00**

Based on Bank BNI's quarterly RGEC composite score for the 2020–2025 period, the bank's performance shows an upward and increasingly stable trend. In 2020, the composite score fluctuated between quarters, dropping from 86.67% in Q1, to 80.00% in Q3 and Q4. Entering 2021, performance began to improve, with the value rising to 86.67% in Q3 and Q4. Subsequently, from 2022 to 2023, the composite value remained relatively

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stable at around 86.67% across nearly all quarters, indicating the bank's sound financial condition. From 2024 to 2025, there was a more consistent increase, with the composite value reaching 90.00% in most quarters, reflecting a very healthy condition. Overall, Bank BNI showed an upward trend, moving from a condition that had previously fluctuated to one that was very healthy and stable in every quarter.

Table 10. Results of Bank BRI's REGC Value Measurement 2021–2025

Bank	Year	REGC Composite Value			
		Q1	Q2	Q3	Q4
BRI	2020	86.67	86.67	86.67	86.67
	2021	86.67	86.67	86.67	86.67
	2022	86.67	86.67	86.67	90.00
	2023	86.67	86.67	86.67	86.67
	2024	86.67	86.67	86.67	86.67
	2025	86.67	86.67	86.67	86.67

Based on Bank BRI's quarterly RGEC composite score for the 2020–2025 period, the bank's performance is in a very stable condition. This is evident from the composite score consistently remaining at 86.67% in every quarter without experiencing fluctuations. This condition indicates that Bank BRI is able to sustain a high level of financial health consistently throughout the entire observation period. This stability reflects that the aspects of risk profile, good corporate governance, earnings, and capital are under control and optimized. Thus, overall, Bank BRI remains consistently in the "healthy" category in every quarter without any significant decline in performance.

Table 11. Results of Bank Mandiri's REGC Value Measurement 2021–2025

Bank	**Year**	**REGC Composite Value**			
		Q1	Q2	Q3	**Q4**
MANDIRI	2020	86.67	86.67	86.67	**86.67**
	2021	86.67	86.67	86.67	**86.67**
	2022	86.67	86.67	86.67	**93.33**
	2023	90.00	90.00	90.00	**90.00**
	2024	90.00	90.00	90.00	**90.00**
	2025	90.00	90.00	90.00	90.00

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Based on Bank Mandiri's quarterly RGEC composite score for the 2020–2025 period, the bank's performance has improved and remains stable. From 2020 to 2022, the composite score ranged between 86.67% in each quarter, with a slight increase in Q4 2022 to 93.33%, indicating a healthy condition. From 2023 to 2025, there was a more consistent increase, with the composite value reaching 90.00% in nearly all quarters, indicating a very healthy condition. This indicates that Bank Mandiri is capable of continuously improving and maintaining its financial performance and risk management. Overall, Bank Mandiri demonstrates a positive performance trend, moving from a stable condition toward a more optimal and very healthy condition in each quarter.

This is in line with the research by Sari and Tasman (2020), which states that the RGEC method is capable of comprehensively reflecting a bank's health because it takes into account both risk and financial performance aspects in a holistic manner.

Table 12. Normality Test

		Kolmogorov-Smirnova			Shapiro-Wilk		
BANK_NUM		Statistic	df	Sig.	Statistic	df	**Sig.**
REGC_VALUE	BNI	0.292	24	0.000	0.826	24	**0.001**
	BRI	0.539	24	0.000	0.209	24	**0.000**
	MANDIRI	0.304	24	0.000	0.733	24	0.000

Based on the results of the normality test using the Shapiro-Wilk method, the significance values obtained were 0.001 for Bank BNI, 0.000 for Bank BRI, and 0.000 for Bank Mandiri. All of these significance values are less than 0.05, so it can be concluded that the data are not normally distributed. Therefore, hypothesis testing in this study uses a nonparametric test, namely the Kruskal-Wallis test.

Table 13. Kruskal-Wallis Test

BANK_NUM		**N**	**Mean Rank**			**REGC_VALUE**
REGC_VALUE	BNI	24	32.81		Kruskal-Wallis H	**12.506**
	BRI	24	29.88		Df	**2**

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	MANDIRI	24	46.81		Asympt. Sig.	**0.002**
	Total	72				

Based on the results of the Kruskal-Wallis test, a significance value of 0.002 was obtained, which is smaller than 0.05; therefore, it can be concluded that there is a significant difference in the banks' financial health levels based on the RGEC method. Thus, the null hypothesis (H01), which states that there is no difference, is rejected, while the alternative hypothesis (H11), which states that there is a difference, is accepted. This indicates that financial performance and risk management vary among banks during the study period. These differences are evident from the mean rank values, where Bank Mandiri has the highest value at 46.81, followed by Bank BNI at 32.81 and Bank BRI at 29.88. This indicates that Bank Mandiri has the best health status compared to other banks during the study period. This aligns with research stating that a risk-based approach in the RGEC method provides a more accurate picture of a bank's health compared to conventional methods (Pratikto & Afiq, 2021).

From the perspective of Signalling Theory, these RGEC assessment results serve as a signal sent by management to external parties regarding the bank's condition. A high RGEC value reflects a positive signal (good news) that the bank possesses sound risk management and strong financial stability, thereby enhancing investor confidence. Conversely, banks with lower scores send a weaker signal regarding their ability to manage risk and long-term performance. Therefore, the RGEC method is capable of providing a signal that reflects the bank's fundamental conditions and the sustainability of its performance.

Bank Health Assessment Using the CAMELS Method

The CAMELS method is a bank health assessment method covering six aspects: capital, asset quality, management, earnings, liquidity, and sensitivity to market risk. The assessment uses financial ratios such as CAR, NPL, NPM, ROA, LDR, and PDN to comprehensively describe the bank's financial condition and risk levels.

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Table 14. Results of the CAMELS Assessment for Bank BNI 2021–2025

Bank	Year	CAMELS Composite Score			
		Q1	Q2	Q3	**Q4**
BNI	2020	83.33	80.00	76.76	**76.76**
	2021	80.00	80.00	83.33	**86.67**
	2022	86.67	86.67	86.67	**86.67**
	2023	86.67	86.67	86.67	**86.67**
	2024	86.67	90.00	90.00	**90.00**
	2025	90.00	90.00	90.00	90.00

Based on Bank BNI's quarterly CAMELS composite score for the 2020–2025 period, the bank's performance has improved and become increasingly stable over time. In 2020, the composite score still fluctuated from quarter to quarter, dropping from 83.33% in Q1 to 76.76% in Q3 and Q4, indicating that conditions were not yet stable. Entering 2021, performance began to improve, with the composite score ranging from 80.00% to 86.67%. Subsequently, from 2022 to 2023, the composite score remained relatively stable at around 86.67% across nearly all quarters, reflecting a healthy condition. From 2024 to 2025, there was a more consistent increase, with the composite value reaching 90.00% in most quarters, indicating very healthy conditions. Overall, Bank BNI showed an upward trend, moving from fluctuating conditions to more stable and optimal performance in each quarter.

Table 15. Results of Bank BRI's CAMELS Score Measurement, 2021–2025

Bank	Year	CAMELS Composite Score			
		Q1	Q2	Q3	**Q4**
BRI	2020	76.76	76.76	76.76	**76.76**
	2021	76.76	76.76	76.76	**76.76**
	2022	76.76	76.76	76.76	**80.00**
	2023	76.76	76.76	76.76	**76.76**
	2024	76.76	76.76	76.76	**76.76**
	2025	76.76	76.76	76.76	76.76

Based on Bank BRI's quarterly CAMELS composite score for the 2020–2025 period, the bank's performance is in a very stable condition. This is evident from the

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composite score, which consistently remained at 76.76% in every quarter throughout the entire observation period, without experiencing any fluctuations. This condition indicates that Bank BRI is able to maintain a relatively constant level of health, even though it is in a lower category compared to other banks. This stability indicates that the aspects of capital, asset quality, management, earnings, liquidity, and sensitivity to market risk are under control, but have not yet experienced a significant improvement. Overall, Bank BRI shows stable performance but tends to be stagnant in each quarter.

Table 16. Results of Bank MANDIRI's CAMELS Score Measurement 2021–2025

Bank	Year	CAMELS Composite Score			
		Q1	Q2	Q3	**Q4**
MANDIRI	2020	76.76	76.76	76.76	**76.76**
	2021	76.76	76.76	76.76	**76.76**
	2022	76.76	76.76	76.76	**83.33**
	2023	80.00	80.00	80.00	**80.00**
	2024	80.00	80.00	80.00	**80.00**
	2025	80.00	80.00	80.00	80.00

Based on Bank Mandiri's quarterly CAMELS composite score for the 2020–2025 period, the bank's performance is relatively stable with an upward trend. From 2020 to 2022, the composite score consistently remained at 76.76% each quarter, indicating stability despite no significant improvement. From 2023 to 2025, the composite score increased to 80.00% across all quarters, reflecting an improvement in the bank's performance. This increase indicates that Bank Mandiri has been able to enhance its financial health and maintain it consistently in subsequent periods. Overall, Bank Mandiri demonstrates stable performance with an upward trend toward better conditions in each quarter. These results are consistent with research indicating that the CAMELS method is capable of providing a comprehensive overview of a bank's financial health through various financial indicators (Kasmir, 2019).

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Table 17. Normality Test

BANK_NUM		Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	**Sig.**
CAMELS _VALUE	BNI	0.299	24	0.000	0.832	24	**0.001**
	BRI	0.539	24	0.000	0.209	24	**0.000**
	MANDIRI	0.302	24	0.000	0.733	24	0.000

Based on the results of the normality test using the Shapiro-Wilk method, the significance values obtained were 0.001 for Bank BNI, 0.000 for Bank BRI, and 0.000 for Bank Mandiri. All of these significance values are less than 0.05, so it can be concluded that the data are not normally distributed. These results are also supported by the Kolmogorov-Smirnov test, which showed a significance value of 0.000 for all banks, further indicating that the data are not normally distributed. Consequently, since the data do not meet the assumption of normality, hypothesis testing in this study employs a nonparametric test, specifically the Kruskal-Wallis test to assess differences between groups.

Table 18. Kruskal-Wallis Test

BANK_NUM		N	Mean Rank			CAMELS_SCORE
CAMELS_SCOR E	BNI	24	56.94		Kruskal-Wallis H	**45.609**
	BRI	24	19.58		df	**2**
	MANDIRI	24	32.98		Asympt. Sig.	**0.000**
	Total	72				

Based on the results of the Kruskal-Wallis test, a significance value of 0.000 was obtained, which is less than 0.05; therefore, it can be concluded that there is a significant difference in the banks' health levels based on the CAMELS method. Thus, the null hypothesis (H02) is rejected and the alternative hypothesis (H12) is accepted. Based on the mean rank values, Bank BNI has the highest value of 56.94, followed by Bank Mandiri at 32.98 and Bank BRI at 19.58; thus, it can be concluded that Bank BNI has the best health level based on the CAMELS method during the study period. This aligns with the research by Nugroho and Sari (2023), which indicates that differences in bank health

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levels measured using the CAMELS method are influenced by management's ability to manage operations and the bank's financial condition.

This explains that variations in assessment results among banks are a consequence of differences in each bank's strategies and operational efficiency. The PDN ratio, as an indicator of sensitivity to market risk, also shows that the lower the PDN value, the lower the risk the bank faces regarding exchange rate fluctuations, thereby reflecting a healthier condition. This aligns with Signal Theory, where CAMELS assessment results serve as information signaling to investors regarding the bank's financial performance. A high CAMELS score signals that the bank is capable of generating optimal profits and maintaining operational efficiency. Conversely, a lower score indicates that the bank needs to improve its financial performance. Thus, the CAMELS method better reflects signals regarding short-term financial performance, which is the primary concern for investors.

Comparison of RGEC and CAMELS

Pratikto and Afiq (2021) state that differences in bank health assessment methods can yield different results due to variations in indicators and analytical approaches. The RGEC method places greater emphasis on risk and governance aspects, whereas the CAMELS method focuses more on a comprehensive analysis of financial ratios. Additionally, Putri's (2024) research also indicates that using two different assessment methods can yield differing results, making a comparative analysis necessary to obtain a more complete picture of a bank's health.

In this study, the analysis results indicate that there are differences in the levels of bank health produced by the two methods. This is evident from the differences in bank rankings, where under the RGEC method, the bank with the best health level is Bank Mandiri, whereas under the CAMELS method, it is Bank BNI. This difference indicates that each method has a different perspective in assessing bank performance. Therefore, to determine whether this difference is statistically significant, further testing is required using the Wilcoxon Signed Rank Test as a nonparametric test for paired data.

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Table 19. Wilcoxon Signed-Rank Test

		N	Mean Rank	Sum of Ranks			CAMELS_SCORE
							REGC_SCORE
CAMELS_SCORE	Negative Ranks	55a	28.00	1540.00		Z	**-6,659b**
REGC_SCORE	Positive Ranks		0.00	0.00		Asympt. Sig. (2-tailed)	**0.000**
	Ties	17c					
	Total	72					

Based on the results of the Wilcoxon Signed Rank Test, a significance value of 0.000 was obtained, which is less than 0.05; therefore, it can be concluded that there is a significant difference between the assessment of bank health levels using the RGEC and CAMELS methods. Thus, the null hypothesis (H03) is rejected and the alternative hypothesis (H13) is accepted. The test results show that there are 55 negative ranks, meaning that in 55 data points, the CAMELS score is lower than the RGEC score. Meanwhile, there are no positive ranks, indicating that there are no instances where CAMELS is higher than RGEC, and there are 17 ties, indicating that the results of the two methods are the same. This indicates that the RGEC method tends to yield higher ratings than CAMELS when assessing a bank's health. This aligns with Signal Theory; this difference suggests that the signals received by investors may vary depending on the assessment approach used. The RGEC method provides a more comprehensive signal regarding long-term stability because it emphasizes aspects of risk and governance, whereas the CAMELS method provides a signal that is more focused on financial performance and operational efficiency. Therefore, the simultaneous use of both methods will yield more complete and more accurate signal for investors in assessing a bank's condition and making investment decisions.

CONCLUSION

Based on the research findings, it can be concluded that there are significant differences in the health levels of state-owned banks (BUMN) when using both the RGEC and CAMELS methods during the 2020–2025 period. Under the RGEC method, Bank Mandiri demonstrated the best health level compared to Bank BNI and Bank BRI, reflecting strengths in risk management, governance, profitability, and capital adequacy. Meanwhile, under the CAMELS method, Bank BNI demonstrated the best health level, indicating that based on financial ratio analysis—such as asset quality, profitability,

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liquidity, and sensitivity to market risk—Bank BNI performs more optimally than other banks. Additionally, the Wilcoxon test results indicate a significant difference between the RGEC and CAMELS methods, with the RGEC method tending to yield higher ratings. This difference stems from the differing approaches used: RGEC is risk- and governance-based, whereas CAMELS focuses more on financial performance. This finding aligns with Signaling Theory, which states that information conveyed through financial statements and corporate performance evaluations serves as a signal to external parties—particularly investors—in assessing a company's condition and prospects. Banks with higher levels of financial health send positive signals (good news) that can boost investor confidence, while the differences in results between the methods indicate that the signals received may vary depending on the assessment approach used. Thus, there is no single method that is entirely superior; rather, the two methods complement each other in providing an overview of a bank's financial health. Therefore, the concurrent use of the RGEC and CAMELS methods is highly recommended to yield a more comprehensive and accurate assessment for investors, management, and stakeholders in decision-making.

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