

## **Analysis of Bank Health Levels Using Camel, RGEC, and Altman Z-Score Methods**

**(Study on Regional Development Banks of Central Java, East Java, West Java and  
Banten Period 2019 - 2021)**

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**Abstract:** This study aims to determine the level of financial performance of Regional Development Banks assessed using the CAMEL, RGEC, and Altman Z-Score methods. The population in this study used Regional Development Banks in Indonesia for the 2019-2021 period. The samples for this study were 3 Regional Development Banks, namely BPD Central Java, BPD East Java, and BPD West Java and Banten. Data analysis methods CAMEL (Capital, Assets, Management, Earnings and Liquidity), RGEC (Risk Profile, Good Corporate Governance, Earnings, and Capital) and Altman Z-score

**Keywords:** Bank Health Level, Financial Performance, Regional Development Bank, CAMEL, RGEC, Altman Z-Score

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### **1. Introduction**

The 2019 coronavirus disease (COVID-19) pandemic and spread has been declared by the World Health Organization (WHO) as a global pandemic after March 11, 2020 and the health declaration of Presidential Decree No. 11 of 2020. Due to the COVID-19 pandemic, credit activities, which are the backbone of banking, are at risk of slowing down. This is considering the state of most economic sectors, including the banking sector in Indonesia, which tends to deteriorate, the large number of unemployment and business disruptions that cause bad debts.

Types of banks in Indonesia can be divided into 2 major groups, namely conventional banks and Islamic banks. In addition to conventional banks and Islamic banks, Indonesia has another type of bank, namely the Regional Development Bank (BPD), which has the function of promoting regional economic growth, holding cash, managing regional finances, and being a source of regional income. This bank was established with the aim of contributing to the equitable development of all regions in Indonesia. The decline in bank growth causes a decrease in public confidence in using the bank because it is considered that the bank's performance is not good. To measure the performance of the bank is good or not can be done by measuring the health of the bank. The business activities carried out by the bank can take place smoothly if the bank's conditions are in a healthy category.

The health level of a bank is a qualitative assessment of various aspects that affect the condition or performance of a bank through quantitative assessment and or qualitative assessment of the factors of capital, asset quality, management, income, and liquidity according to the CAMEL method. The RGEC method is a development of the previous method, the CAMEL method. The aspects that are assessed in this method are Risk Profile (risk profile), Good Corporate Governance (management/corporate governance), Earning (profitability), and Capital (capitalization). The Z-Score (Altman) method is a tool that takes into account and combines several certain financial ratios in the company in a discriminant equation that will produce a certain score that will indicate the level of possible bankruptcy of the company. The aspects in this method are net working capital to assets, retained earnings to total assets, profit before tax and interest to total assets, and Market Value of Equity to Total Debt.

This research refers to research conducted by Ashuri and Hosen (2022) which examines the Health level Analysis of PT Bank BTPN Syariah Tbk. Period 2016 - 2020 with CAMELS, RGEC, and Altman Z-score methods. While in this study there are differences and additional samples, namely 3 Regional Development Banks in Central Java, East Java, West Java and Banten. Current research uses the CAMEL method without including the Sensitivity of Market factor. The research period used for current research is 2019 - 2021 while previous research used the 2016 - 2019 research period.

Based on the foregoing, it can be described in the research title: "**Analysis of the Health Level of Development Banks Using the CAMEL, RGEC, and Altman Z-Score Methods (Study on Regional Development Banks in Central Java, East Java, West Java and Banten)**"

## 2. Literature Review

### 2.1 Regional Development Bank

Regional Development Bank (BPD) is a bank established and owned partly or wholly by the Regional Government (Agustin, 2013: 39). BPD operates like other Commercial Banks and can provide services in payment traffic, but BPD Banks have different characteristics from other Commercial Banks. The establishment of BPD was outlined by the government through Law Number 13 of 1962. The purpose of the government to establish BPD is to assist the implementation of regional development to be more equitable throughout the territory of Indonesia.

### 2.2 Analysis of Bank Health

In the Circular Letter of the Financial Services Authority of the Republic of Indonesia Number 4/POJK.3/2016 regarding the health level of commercial banks. In the circular letter, it is stated that the health level of a bank is the result of an assessment of the bank's condition carried out on the risk and performance of the bank. Composite Rating is the final rating of the Bank Health Level assessment results. Thus the composite level becomes the basis for assessing the health level of the bank to determine the health predicate of the Bank. The level of healthy predicate of the bank according to the circular letter is as follows:

1. Composite Rating 1 (PK-1) means "very healthy"
2. Composite Rating 2 (PK-2) means "healthy"
3. Composite Rating 3 (PK-3) means "moderately healthy"
4. Composite Rating 4 (PK-4) means "less healthy"
5. Composite Rating 5 (PK-5) means "unhealthy"

### 2.3 Analysis of Bank Financial Performance

Financial performance analysis or financial ratio analysis is a method of analyzing business taken from financial statements such as balance sheets, income statements, cash flow statements, and statements of capital changes. Financial performance is an illustration of each economic result that can be obtained by a banking corporation within a certain period of time through various corporate activities in order to obtain profits efficiently and effectively. Financial performance can be measured by its development through the provision of analysis on various financial data reflected in the financial report.

## 3. Methodology and Hypothesis Development

### 3.1 Hypothesis Development

The hypothesis of this research is that it is suspected that by analyzing the assessment using the CAMEL, RGEC, and Altman Z-score methods, the Health level of the Regional Development Banks of Central Java, East Java, West Java and Banten for the period 2019 to 2021 can be known.

### 3.2 Data and Data Sources

The data used in this study are secondary data. Secondary data is a data source obtained by researchers indirectly by using intermediary media and through documentation activities (obtained and recorded by other parties) (Sugiyono, 2011). In this study, secondary data sources were obtained through annual reports published by the official websites of each bank BPD Central Java (<https://www.bankjateng.co.id/>), BPD East Java (<https://www.bankjatim.co.id/>), BPD West Java and Banten (<https://bankbjb.co.id/>).

### 3.3 Population and Research Sample

The population of this study is Regional Development Banks in Indonesia totaling 26 Regional Development Banks, according to the list of Regional Development Banks provided by the Financial Services Authority (OJK). The sample implemented in this study is the Regional Development Bank in the island of Java, namely BPD Central Java, BPD East Java, BPD West Java and Banten, and the data that researchers will take is an interval of 3 years, namely 2019 –2021.

### 3.4 Data Analysis Method

The following is each ratio formula used in the CAMEL method:

#### 1. Capital

The ratio used in this study is the Capital Adequacy Ratio (CAR).

$$CAR = \frac{\text{Total Capital}}{\text{Risk-weighted asset (RWA)}} \times 100\%$$

**2. Asset Quality**

The ratio used is the ratio of the quality of productive assets (KAP)

$$KAP = \frac{\text{Classified earning assets}}{\text{Total Productive Assets}} \times 100\%$$

**3. Management**

Net profit margin (NPM) ratio can be calculated using the formula

$$NPM = \frac{\text{Net Profit}}{\text{Operating Profit}} \times 100\%$$

**4. Earnings**

In this earnings calculation using 2 ratio formulas, namely Return on Assets (ROA) and Operating Expenses to Operating Income (BOPO):

$$ROA = \frac{\text{Profit before tax}}{\text{Total assets}} \times 100\% \quad BOPO = \frac{\text{Operational costs}}{\text{Operating Income}} \times 100\%$$

**5. Liquidity**

The ratio used to find the liquidity ratio is the ratio of Financing to deposit ratio (FDR)

$$FDR = \frac{\text{Total Loans Provided}}{\text{Total capital} + \text{Total third party funds}} \times 100\%$$

The following is each ratio formula used in the RGEC method:

**1. Risk Profile**

In this study, researchers measured the risk profile factor using 2 indicators, namely *NonPerforming Financial(NPF)* and *FinancingtoDepositRatio (FDR)*. FDR formula is the same as CAMEL method

$$NPF = \frac{\text{Problem Financing}}{\text{Total Financing}} \times 100\%$$

**2. GCG (Good Corporate Governance)**

GCG ratios include the Bank's compliance function, Bank plans, provision of funds. Assessment of GCG can be measured using the Net profit Margin (NPM) ratio indicator. The NPM formula is the same as described in the CAMEL method.

**3. Earnings**

The calculation of earnings uses 3 methods, namely Return on Assets (ROA), Return on Equity (ROE), and Operating Expenses to Operating Income (BOPO). the formulas for ROA and BOPO are the same as in the CAMEL method above, while the formula for ROE is as follows

$$ROE = \frac{\text{Net Profit after Tax}}{\text{Equity}} \times 100\%$$

**4. Capitals**

As with the previous method, there is also an assessment of capital adequacy in RGEC. The ratio that can measure the capital factor is the CAR ratio. The CAR formula and assessment criteria are as described in the CAMEL method.

The following is each ratio formula used in the Altman Z-Score method:

$$\text{Altman Z-score} = 6,56 X1 + 3,26 X2 + 6,72 X3 + 1,05 X4$$

X1: Working Capital to Total Asset

X2: Retained Earnings to Total Asset

X3: Earnings before Interest and Tax to Total Asset

X4: Market Value Equity to Total Liabilities

In the model, banks that have a Z score > 2.60 are classified as healthy companies, while companies or banks that have a Z score < 1.1 are classified as potential bankrupt companies, Z scores between 1.1 and 2.60 are classified as companies in the gray area.

#### 4. Result and Discussion

The following table shows the results of the calculation of the bank's health level using the CAMEL method for the period 2019 - 2021:

Table 1. Calculation of CAMEL method

Regional Development Banks	YEAR	CAPITAL	ASSET QUALITY		MANAGEMENT	EARNINGS		LIQUIDITY
		CAR	KAP	NPF	NPM	ROA	BOPO	FDR
Central Java	2019	19.55%	1.96%	2.88%	76.53%	1.88%	80.65%	99.28%
	2020	20.35%	2.46%	3.52%	75.21%	2.11%	79.13%	86.64%
	2021	21.80%	2.08%	3.17%	77.09%	2.16%	75.35%	80.37%
East Java	2019	24.38%	1.38%	2.77%	76.53%	2.43%	71.54%	63.34%
	2020	24.54%	1.98%	4.00%	98.20%	1.80%	76.70%	60.58%
	2021	26.43%	1.90%	4.48%	85.04%	1.92%	76.00%	51.38%
West Java and Banten	2019	18.73%	1.08%	1.63%	75.56%	1.60%	84.29%	97.68%
	2020	16.24%	0.92%	1.44%	76.80%	1.54%	84.43%	89.41%
	2021	18.85%	0.80%	1.32%	77.68%	1.63%	82.60%	83.98%

Table 2. Analysis of bank health level CAMEL method

Regional Development Banks	YEAR	CAPITAL	ASSET QUALITY		MANAGEMENT	EARNINGS		LIQUIDITY
		CAR	KAP	NPF	NPM	ROA	BOPO	FDR
Central Java	2019	VH	VH	H	MH	VH	VH	MH
	2020	VH	H	H	MH	VH	VH	NH
	2021	VH	H	H	MH	VH	VH	H
East Java	2019	VH	VH	H	MH	VH	VH	VH
	2020	VH	VH	H	H	VH	VH	VH
	2021	VH	VH	H	H	VH	VH	VH
West Java and Banten	2019	VH	VH	VH	MH	VH	H	MH
	2020	VH	VH	VH	MH	VH	H	MH
	2021	VH	VH	VH	MH	VH	VH	H

#### DESCRIPTION:

- VH = Very Healthy
- H = Healthy
- MH = Moderately Healthy
- LH = Less Healthy
- U = Unhealthy

Based on Table.1, the analysis results are as shown in Table.2. The three banks are in the "Very Healthy" predicate because the CAR ratio is  $\geq 12\%$ . This means that the bank's capital adequacy level is considered good. In the asset quality section, the KAP and NPF ratios are in the "healthy and very healthy" predicate. The smaller the KAP and NPF ratio values, the more effective the bank's performance in handling bank financing. In the management section, the three banks are mostly in a "moderately healthy" predicate due to the low NPM ratio, The higher the net profit, the more effective the company converts revenue into actual profit.  $ROA > 1,5\%$  indicates a "very healthy" predicate, the more optimal and efficient the company's performance in utilizing assets to achieve net profit.  $BOPO \leq 83\%$  is in a "very healthy" predicate, because this ratio is to measure the company's ability to manage its operating costs, the higher the BOPO value indicates that the more inefficient the management of its operating costs. The results of the FDR ratio can be used as an indicator of the ability of banks to pay back withdrawals to be made by customers, seen from the results of the calculation of FDR for each bank there are banks that are less able to pay back in a particular year, there are also those that are very capable of paying back withdrawals to be made by customers.

The following table shows the results of the calculation of the bank's health level using the RGEC method for the period 2019 - 2021:

Table 3. Calculation of RGEC method

Regional Development Banks	YEAR	RISK PROFILE		GCG	EARNINGS			CAPITAL
		NPF	FDR	NPM	ROA	ROE	BOPO	CAR
Central Java	2019	2.88%	99.28%	76.53%	1.88%	13.41%	80.65%	19.55%
	2020	3.52%	86.64%	75.21%	2.11%	13.92%	79.13%	20.35%
	2021	3.17%	80.37%	77.09%	2.16%	15.15%	75.35%	21.80%
East Java	2019	2.77%	63.34%	76.62%	2.80%	15.26%	71.54%	24.38%
	2020	4.00%	60.58%	98.20%	1.80%	14.88%	76.70%	24.54%
	2021	4.48%	51.38%	85.04%	1.92%	13.96%	76.00%	26.43%
West Java and Banten	2019	1.63%	97.68%	75.96%	1.60%	12.99%	84.29%	18.73%
	2020	1.44%	89.41%	76.80%	1.54%	14.08%	84.43%	16.24%
	2021	1.32%	83.98%	77.68%	1.63%	15.43%	82.60%	18.85%

Table 4. Analysis of bank health level RGEC method

Regional Development Banks	YEAR	RISK PROFILE		GCG	EARNINGS			CAPITAL
		NPF	FDR	NPM	ROA	ROE	BOPO	CAR
Central Java	2019	H	MH	MH	VH	H	VH	VH
	2020	H	MH	MH	VH	H	VH	VH
	2021	H	H	MH	VH	VH	VH	VH
East Java	2019	H	VH	MH	VH	VH	VH	VH
	2020	H	VH	H	VH	H	VH	VH
	2021	H	VH	H	VH	H	VH	VH
West Java and Banten	2019	VH	MH	MH	VH	H	H	VH
	2020	VH	MH	MH	VH	H	H	VH
	2021	VH	H	MH	VH	VH	VH	VH

**DESCRIPTION:**

- VH = Very Healthy
- H = Healthy
- MH = Moderately Healthy
- LH = Less Healthy
- U = Unhealthy

The explanation for the results in table.4 is almost the same as the explanation of the CAMEL method, but the difference is that in this RGEC method there is a calculation of the ROE ratio in the earnings section. The higher the ROE value, the higher the profit value that may be obtained by shareholders.

The following table shows the results of the calculation of the bank's health level using the Altman Z-Score method for the period 2019 - 2021:

Table 5. Calculation of Altman Z-Score method

Regional Development Banks	YEAR	X1	X2	X3	X4	Z-SCORE	CRITERIA
Central Java	2019	0.109	0.021	0.019	0.123	1.041	Grey area
	2020	0.110	0.018	0.021	0.124	1.054	Grey area
	2021	0.109	0.019	0.022	0.122	1.051	Grey area
East Java	2019	0.118	0.018	0.024	0.133	1.133	Grey area

	2020	0.120	0.018	0.018	0.136	1.107	Grey area
	2021	0.108	0.015	0.019	0.121	1.017	Grey area
<b>West Java and Banten</b>	2019	0.143	0.024	0.016	0.114	1.239	Grey area
	2020	0.130	0.023	0.015	0.098	1.132	Grey area
	2021	0.129	0.023	0.016	0.095	1.130	Grey area

Based on table.5 obtained different results from the two previous methods, the Altman Z-Score method shows the results that the three banks are in the "Gray Area" or companies that are potentially bankrupt because the Z value is between 1.1 - 2.6. X1 shows the bank's ability to meet short-term obligations. X2 shows whether the bank's profitability is in good condition or not. X3 shows the bank's ability to generate profits. The amount of company assets that become debt collateral ratio debt guarantee ratio which is reflected in the value of X4.

Table 6. Comparative analysis results of the three methods above (CAMEL, RGEC, and Altman Z-Score)

Regional Development Banks	YEAR	CAMEL	RGEC	ALTMAN
<b>Central Java</b>	2019	PK - 2	PK - 2	Grey Area
	2020	PK - 2	PK - 2	Grey Area
	2021	PK - 1	PK - 1	Grey Area
<b>East Java</b>	2019	PK - 1	PK - 1	Grey Area
	2020	PK - 1	PK - 1	Grey Area
	2021	PK - 1	PK - 1	Grey Area
<b>West Java and Banten</b>	2019	PK - 1	PK - 2	Grey Area
	2020	PK - 1	PK - 2	Grey Area
	2021	PK - 1	PK - 1	Grey Area

## 5. Conclusion

Based on the results of research and data analysis that has been carried out, it can be concluded that the Regional Development Banks of Central Java, East Java, West Java and Banten in analyzing the level of bank health in 2019 - 2021 using the CAMEL, RGEC and Altman Z-Score approach measurements as follows:

1. Based on the analysis of the CAMEL method (Capital, Asset, Management, Equity, and Liquidity), overall, BPD Central Java in 2019 and 2020 is in a healthy predicate and 2021 is in a very healthy predicate. BPD East Java from 2019 to 2021 is in a very healthy predicate. BPD West Jawa and Banten are in a very healthy predicate. This shows the overall health of the bank is healthy and can measure the bank's ability to deal with changes in operating conditions and the negative impact of external factors.
2. Based on the analysis of the RGEC method (Risk Profile, Good Corporate Governance, Earning and Capital), overall, BPD Central Java in 2019 and 2020 is in a healthy predicate and 2021 is in a very healthy predicate. BPD East Java from 2019 to 2021 is in a very healthy predicate. BPD West Java and Banten in 2019 and 2020 are in a healthy predicate and 2021 is in a very healthy predicate.
3. Based on the analysis of the Altman Z-Score method, BPD Central Java, East Java, West Java and Banten are in the gray area, which means that the bank is in the gray zone or is in a financial condition between financial distress and safe financial conditions. Bank management must be careful with this condition because it is more likely to predict bankruptcy.

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