EFFECTIVENESS OF RGEC- BANK SOUNDNESS LEVEL AND INFLATION RATE IN PREDICTING POTENTIAL BANKRUPTCY OF BANKS: EVIDENCE FROM INDONESIA

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ABSTRACT

This study examines the effectiveness of RGEC-based bank soundness and inflation rate in predicting the potential for bankruptcy. The samples in this study are the banking sector companies listed on the Indonesia Stock Exchange (IDX) from 2016 to 2020. Using several proxies of the RGEC-based bank soundness and inflation rate, the results of this study indicate that the loan-to-deposit ratio (LDR), self-assessment of good corporate governance, and capital adequacy ratio (CAR) affect the potential of bankruptcy negatively and significantly. Furthermore, non-performing loans (NPL), return on assets (ROA), and inflation rate do not affect the potential for bankruptcy. The result shows that only two indicators, among four of RGEC-based bank soundness, effectively predict the potential bankruptcy. These results suggest that if banking management wants to predict and anticipate bankruptcy based on the bank's soundness, it can be considered to see and maintain the LDR and self-assessment of GCG and CAR.

***Keywords**:* Bankruptcy; CAR; GCG; inflation rate; LDR; NPL; RGEC; ROA

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1. INTRODUCTION

The banking industry, positioned as a linchpin in a country's financial sector, is a cornerstone for economic growth. Operating as a crucial player, a bank functions as a financial intermediary, collecting funds from citizens and redistributing them through various financial instruments like savings and loans. This pivotal role, however, is not without its challenges, as customers often a natural level of distrust towards banks, apprehensive about the institution's ability to fulfill its financial obligations.

This inherent skepticism gains significance when considering the potential consequences of a bank's failure to meet its financial obligations—ultimately leading to severe outcomes, including

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bankruptcy. A bank not managed correctly is on an inevitable path towards disaster. Financial and economic distress, as noted by Altman, Hotchkiss, and Wang (2019), is a primary catalyst for corporate failures and the initiation of bankruptcy filings. These circumstances give rise to four frequently encountered terms in the literature:

1) Failure means that the realized rate of return on the invested capital is lower than the interest rate of the investment.
2) Insolvency is depicting negative firm performance and occurs when a firm cannot fulfill its debts.
3) Default occurs when the borrower violates the agreement with the creditor, as specified in the contract.
4) Bankrupt occurs when its liabilities are higher than the value of its assets.

The insolvency of a company has wide-ranging implications for stakeholders, encompassing secured creditors, unsecured creditors, and employees. This situation may lead to financial losses for investors, incomplete repayment for creditors, potential bankruptcy for suppliers, decreased government tax revenue, and job losses for employees. Consequently, when a company is in financial distress, individual creditors have an incentive to rush to enforce their claims against the company's assets in order to be paid out before the assets are gone (Paterson, 2016). The bankruptcy system is needed to resolve collective action problems among the creditors of a bankrupt company, this is where the formal bankruptcy theory emerged (Schwartz, 2005).

Bankruptcy, especially on a large scale within a country's banking system, has the potential to trigger a financial crisis, further escalating into an economic crisis. Recognizing the severity of this situation, bankruptcy prediction becomes paramount for obtaining timely information about a company's condition. This information, as seen in the analysis to forecast bankruptcy using the Altman Z-score, can guide managerial action to prevent problems before they occur and serve as an early warning about potential bankruptcy.

Altman's Z-score emerges as a robust tool for predicting the likelihood of financial institutions, particularly banks, facing distress or potential bankruptcy. The model's application extends beyond its initial focus on companies, proving its adaptability and effectiveness in the banking sector. Jawabreh and Alsinglawi (2017) highlight its predictive accuracy, with a notable 90-95% success rate in forecasting a company's bankruptcy within one year and a 70-80% accuracy for a two-year prediction.

Supporting this, Chiaramonte, Croci, and Poli (2015) conducted an extensive analysis of European banks, affirming that the Z-score's ability to identify distress events matches or exceeds that of conventional CAMELS variables. Notably, the Z-score's advantage lies in its efficiency, demanding less data while maintaining predictive precision. This becomes particularly significant in the context of sophisticated bank business models, such as those of large and commercial banks.

Further reinforcing the applicability of the Z-score to the banking sector, Kokkoris and Anagnostopoulou (2016) present evidence from the Italian and Greek banking systems. Altman's Z" Score, initially introduced in 1968 for manufacturing companies, exhibited a remarkable 95% accuracy in predicting banking failure one year in advance. This success in the Italian banking

sector paved the way for its effective application in another Eurozone system, the Greek banking sector, showcasing its adaptability and reliability across different financial landscapes.

Expanding the geographical scope, Lious, Felix, and Cibran's (2016) study on the Spanish banking sector demonstrates the Z-score's unwavering predictive capabilities. The model's effectiveness is evidenced by its 100% prediction rate of bankruptcy before the Spanish banking reform. Post-reform, the Z-score maintained its reliability, with a reversal in the classification of banks from the distress area to the grey area, indicating a positive impact of the reform.

In conclusion, Altman's Z-score emerges as a versatile and powerful tool for predicting financial distress in the banking sector. Its success across diverse banking environments, as evidenced by studies in Europe, Italy, Greece, and Spain, underscores its universal applicability and underscores its significance for investors, regulators, and decision-makers in evaluating the stability and success of banking reforms.

An imperative facet of risk management involves a nuanced evaluation of a bank's soundness, serving as a pivotal determinant of its overall health. The significance of appraising the health of banks cannot be overstated; it is the linchpin for discerning whether a bank operates robustly and sustainably. To conduct this assessment, banks are mandated to implement the Risk-Based Bank Rating, as stipulated by the Financial Services Authority Regulation No. 4/POJK.03/2016 on the Commercial Bank Soundness Level. This regulatory framework necessitates a meticulous examination of a bank's soundness through a risk-based lens, constituting a comprehensive and structured analysis amalgamating risk profiles and performance. In this evaluation, crucial elements involve implementing good governance, ensuring profitability, and assessing capital adequacy. The soundness of a bank can be analyzed through a method called RGEC, encompassing risk profile, good governance, profitability, and capital. The RGEC method serves as a dynamic tool, enabling an in-depth assessment of a bank's soundness by adapting to shifts in complexity and the risk profile faced. This multifaceted approach, endorsed by the Financial Services Authority in 2016, underscores the necessity for a sophisticated and adaptive strategy to ensure the stability and resilience of financial institutions.

In dissecting the RGEC soundness rating, a risk-based methodology designed to evaluate the soundness level of a bank, critical components come into focus. This approach comprises a comprehensive assessment incorporating a risk profile, good corporate governance (GCG), earnings, and capital. In the context of this study, the risk profile factor is assessed through proxies such as non-performing loans (indicative of credit risk) and the loan-to-deposit ratio (reflecting liquidity risk). Simultaneously, the GCG factor is approximated through the outcomes of a GCG self-assessment. Additionally, the return on assets serves as a proxy for the earnings factor, while the capital adequacy ratio acts as a proxy for the capital factor.

The intricacies of this evaluation process gain significance in light of the ever-evolving dynamics of the bank's business, which continually shapes the encountered risks. Therefore, the methodology employed in assessing the Bank's Soundness Level should possess the capability to not only capture the present condition but also anticipate future developments. This dual-temporal reflection is imperative to ensure that the assessment of the Bank's Soundness Level becomes a more effective tool. Its utility extends beyond mere performance evaluation, encompassing the implementation of

robust risk management strategies tailored to address significant risks. Moreover, it aligns with regulatory compliance and the application of the precautionary principle, ensuring a proactive stance toward potential risks and uncertainties.

Macroeconomic elements wield a significant influence on the health of banks, extending beyond internal factors; one of these factors is the inflation rate. one of these factors is the inflation rate. Modern quantity theory led by Milton Friedman is one explanation of inflation (Totonchi, 2011). The concept of inflation, characterized by a continuous surge in the prices of goods and services, is particularly pertinent in this context. This delicate equilibrium is exemplified by the interplay between inflation, monetary policies, and credit demand, showcasing the complex relationship between macroeconomic dynamics and the well-being of the banking sector. In essence, evaluating a bank's soundness must not only scrutinize internal factors but also consider macroeconomic elements, with a keen focus on the inflation rate. In macroeconomic terms, inflation is defined as a general and continuous increase in the prices of goods and services (Utari, Cristina, & Pambudi, 2015). This economic indicator holds immense significance as it directly affects the value of money, influencing the public's experience. Given that inflation is an ongoing process, its control becomes crucial, ensuring it remains at a level that doesn't detrimentally impact a country's macroeconomy.

When confronted with a high inflation rate, resulting in a general surge in the prices of goods and services, Bank Indonesia adopts strategic measures to mitigate its impact. Typically, this involves implementing policies to elevate interest rates, aiming to curb the inflationary upswing and stabilize the inflation rate. However, the consequence of such interest rate hikes extends to loan interest rates, prompting a decline in public demand for credit. This interplay between inflation, monetary policies, and credit demand underscores the intricate relationship between macroeconomic dynamics and the banking sector's health, necessitating a nuanced approach to navigate these complexities effectively.

Based on the problems and conditions described before, this study was conducted to find out (1) whether the proxies for each component of the RGEC-based bank soundness level can be used to predict bankruptcy and its effects, (2) whether the inflation rate can be used to predict bankruptcy of banking sector. Understanding these dynamics is crucial for evaluating bank performance, implementing effective risk management, and ensuring compliance with regulations.

2. HYPOTHESES DEVELOPMENT

The Non-Performing Loan (NPL) emerges as a pivotal gauge in assessing the robustness of banks, particularly in the realm of credit risk evaluation. It serves as a proxy by juxtaposing the count of non-performing loans against the total loans, offering insights into the credit health of financial institutions. Bank Indonesia, recognizing the significance of this metric, establishes a stringent criterion, mandating a net NPL ratio to remain below 5%. The escalation in the NPL ratio signals a concerning trend, indicating a proliferation in non-performing loans. This ominous trajectory poses a direct threat to the financial stability and overall soundness of the bank, painting a nuanced picture of the intricate interplay between credit risk management and the broader health of financial institutions.

Several studies conducted by Labita and Yudowati (2020), Kuncoro and Agustina (2017), Andari and Wiksuana (2017) have found that NPL does not have a statistical influence on the potential for bankruptcy in the banking sector. These results contrast with the findings of other studies conducted by Habbi and Harto (2019), Ismawati and Istria (2015), which state that NPL has a statistically positive effect on the potential for bankruptcy in the banking sector. Based on this framework, the following hypothesis can be formulated:

H1: NPL ratio positively affects the banking sector's potential bankruptcy.

The Loan-to-Deposit Ratio (LDR) emerges as a critical proxy for appraising a bank's soundness, specifically in gauging liquidity risk. This metric delves into the bank's capacity to meet depositors' withdrawals, offering a quantitative measure of liquidity resilience. Bank Indonesia stipulates stringent benchmarks for LDR, setting the minimum allowable limit at 78% and capping the maximum permissible level at 92%. The LDR ratio becomes a barometer where a higher value implies diminished liquidity capacity, posing potential challenges in meeting deposit obligations. Conversely, a lower LDR ratio signifies a shortfall in the bank's efficacy in generating income through lending activities. This intricate dance between LDR values and liquidity risk underscores the delicate balance that financial institutions must strike to ensure both liquidity resilience and sustainable revenue generation.

Some research conducted by Theodorus and Artini (2018), Andari and Wiksuana (2017), and Kuncoro and Agustina (2017) show that LDR has no statistically significant effect on the potential for bankruptcy in banking companies. However, the results of other studies were conducted by Habbi and Harto (2019) claim that LDR has a statistically negative effect on the potential for bankruptcy in the banking sector. Based on this framework, the following hypothesis can be stated:

H2: LDR negatively affects the banking sector's potential bankruptcy.

A company must realize that implementing good corporate governance is essential. GCG principles that are correctly applied will regulate the relationship between stakeholders in a balanced way. GCG is the foundation for creating sustainable added value for stakeholders to help the company achieve its goals and ideals. The better the value of self-assessment of governance, the more the company will focus on improving the company's performance, both financially and non-financially. The worse the governance self-assessment score, the more vulnerable the company is to bankruptcy. This is due to the lack of alignment of stakeholder relations, which impacts the company's performance and hinders it from achieving its goals.

Some studies conducted by Wijayanti, Sari, and Indriasih (2018) and Wandari (2017) found that the self-assessment of GCG has no statistically significant influence on the potential for bankruptcy in the banking sector. However, the results of other studies by Mahmud, Lilik Handajani, and Waskito (2021), Rosiana, Irawati, and Prasaja (2020) show that self-assessment of GCG has a statistically negative effect. Based on this framework, the following hypothesis can be stated:

H3: Self-assessment good corporate governance negatively affects the banking sector's potential bankruptcy.

The Return on Assets (ROA) assumes a pivotal role as a proxy in gauging the financial health of a bank, specifically concerning the earnings factor. Acting as a metric, ROA measures the company's ability to generate net income based on a certain level of assets (Hanafi & Halim, 2016). Functioning as a barometer of financial performance, ROA provides insights into the bank's soundness. A heightened ratio signifies adept utilization of assets to yield profits efficiently. Conversely, a diminished ROA value implies a downturn in financial performance and health, thereby accentuating the potential jeopardy of bankruptcy. This intricate relationship between ROA and the bank's fiscal robustness accentuates the need for astute financial management strategies to ensure sustained profitability and guard against the specter of financial instability.

Some studies by Labita and Yudowati (2020) and Anggraini (2017) found that ROA has a statistically significant positive effect on the potential for bankruptcy in the banking sector. Another research by Rahmania and Hermanto (2014) found that ROA does not influence the potential for bankruptcy in the banking sector. However, studies by Kisman and Krisandi (2019), Habbi and Harto (2019) and Kuncoro and Agustina (2017) found that ROA has a statistically significant negative effect on the potential for bankruptcy in the banking sector. Based on this framework, the following hypothesis can be stated:

H4: ROA negatively affects the banking sector’s potential bankruptcy.

The capital Adequacy Ratio is a proxy for measuring bank soundness for the capital factor. The capital adequacy ratio can absorb the risk of loss that banks might experience from risky assets. According to the Circular Letter of the Financial Services Authority Number 7/SEOJK.03/2020 concerning the Minimum Capital Adequacy Requirement for Commercial Banks, banks must provide a minimum capital of at least 8% of Risk Weighted Assets. The greater the CAR value, the better the bank can face the risk of loss. In contrast, the smaller the CAR value, the bank's ability to face risks will decrease, and the potential for bankruptcy will decrease.

Some studies conducted by Habbi and Harto (2019), Theodorus and Artini (2018), Andari and Wiksuana (2017) found that CAR has no statistically significant effect on the potential for bankruptcy in the banking sector. However, other studies conducted by Maisarah, Zamzami, and Arum (2018), Khadapi (2017), and Kuncoro and Agustina (2017) show that CAR statistically influences a negative and significant effect on the probability of bankruptcy. Based on this framework, the following hypothesis can be stated:

H5: CAR negatively affects the banking sector’s potential bankruptcy.

Exerting control over the inflation rate stands as a crucial imperative in upholding economic stability. A surge in the inflation rate precipitates a decline in people's purchasing power, thereby posing a direct threat to economic equilibrium. The ripple effect of a high inflation rate extends to the financial realm, resulting in elevated interest rates, often coupled with an upswing in loan interest rates. This confluence of circumstances, characterized by heightened credit interest, renders saving costs in banks relatively expensive. Consequently, this financial landscape induces a reduction in the public's demand for credit, concurrently diminishing bank income. This intricate interplay between inflation, interest rates, and credit dynamics underscores the delicate equilibrium

that must be meticulously managed to preserve economic stability and sustain the financial health of banking institutions.

Some studies conducted by Wafi, Mardani, and Wahono (2021), Nilasari and Ismunawan (2021) found that the inflation rate does not affect statistically toward potential for bankruptcy in banking sector. In contrast, some researchers conducted by Naufal (2020), Rohiman and Damayanti (2019), Irwandi and Rahayu (2018) found that the inflation rate has a significant positive influence statistically toward potential for bankruptcy in banking sector. Based on this framework, the following hypothesis can be stated:

H6: Inflation rate positively affects the banking sector's potential bankruptcy.

3. METHOD, DATA, AND ANALYSIS

3.1. Data and Sample

Information from the banks' annual reports is used in this study to find their ratios, such as non-performing loans, loan-to-deposit ratios, self-assessment of GCG, return on assets, and capital adequacy ratio. The integration of these key financial indicators allows for a nuanced understanding of the intricate relationship between these ratios and the predictive power of Altman's Z-score in the context of the Indonesian banking sector. This study also used Indonesia's inflation rate data obtained from the official website of Bank Indonesia at www.bi.go.id, acknowledging the macroeconomic influence on banks' performance and stability. Companies in the banking sector listed on the Indonesia Stock Exchange (IDX) for the 2016-2020 period are the population in this study. Moreover, the purposive sampling method is used in this study. Table 1 provides the determination of the sample used in this study.

Table 1: Research Sampling Criteria

Criteria	Total
Companies in banking sector listed on the Indonesia Stock Exchange for the 2016-2020 period.	43
Companies in banking sector that do not publish annual reports in the company website or the Indonesia Stock Exchange (IDX) website for the 2016-2020 period.	0
Companies that do not disclose data related to research variables and are available in full in publications during the 2016-2020 period.	0
Delisting from the Indonesia Stock Exchange during the 2016-2020 period.	0
Number of companies that can be used as samples	43
Number of research samples (43 companies x 5 years)	215

3.2. Variable and Definitions of Variables

The dependent variable used in this study is bankruptcy which is proxied using the Altman Z-Score Model. as detailed in Table 2, which presents the diverse formulas utilized within the Altman model (Altman, Hotchkiss, & Wang, 2019). The Altman Z-Score, a renowned financial metric, offers a multifaceted assessment that incorporates various financial ratios. This model, developed by Altman and his colleagues, stands as a widely recognized tool for predicting bankruptcy likelihood by evaluating a company's financial health. By employing these robust formulas, the study aims to capture a nuanced understanding of the intricate relationships between key financial indicators, providing a comprehensive framework for analyzing and predicting bankruptcy risks.

Table 2: Research Sampling Criteria

If public firm	Z = 1.2(Working capital/Total assets) + 1.4(Retained Earnings/Total Assets) + 3.3(EBIT/Total Assets) + 0.6(Market Value of Equity/Book Value of Total Liabilities) + 1.0(Sales/Total Assets)
If private firm	Z’ = 0.717(Current Assets – Current Liabilities/Total assets) + 0.847(Retained Earnings/Total Assets) + 3.107(EBIT/Total Assets) + 0.420(Book Value of Equity/ Total Liabilities) + 0.998(Sales/Total Assets)
If service firm (non-manufactured firm)	Z’’ = 6.56 (working capital/total assets) + 3.26 (retained earnings/total assets) + 6.72 (EBIT/total asset) + 1.05 (book value of equity/total liabilities)

This study identifies the potential for bankruptcy in banking sector companies using the Z’’'-Score Model. Z"-Score will show whether the company is in the safe zone, gray zone, or distress zone. The criteria used to assess the Z"-score are as follows (Catherin & Purwanto, 2016):

1) The company will be classified as a healthy company or is in the safe zone if the Z’’-score > 2.60.
2) The company is classified as a company that has the potential to go bankrupt or is in a distress zone if the Z’’-score <1.1.
3) The company is classified as a gray area company or is in the gray zone if the Z’’- score is between 1.1 – 2.60.

On the other hand, the independent variables include: NPL, LDR, GCG self-assessment, ROA, CAR, and inflation rate. The overall variables measurements are described in Table 3.

Table 3: Definitions of Dependent and Independent Variables

Variable	Definition	Measurement
Dependent		
Z''-score	Altman Z''-score	6.56 (working capital/total assets) + 3.26 (retained earnings/total assets) + 6.72 (EBIT/total asset) + 1.05 (book value of equity/total liabilities)
Independent		
NPL	Non-performing loan	Non-performing loan/total loans
LDR	Loan-to-deposit ratio	Credit/third party fund
GCG	GCG self-assessment	GCG self-assessment composite chart of the annual report
ROA	Return on assets	Net profit/total assets
CAR	Capital Adequacy Ratio	Total capital/risk weighted assets
INF	Inflation rate	Annual inflation data from Bank Indonesia website

3.3. Analysis Method

As the dependent variable is a categorical variable, the determination of the banks' potential for bankruptcy will be measured using a dummy variable. If the independent variable is categorical or dichotomous, then in the regression model, the variable must be declared as a dummy variable (Ghozali, 2018). The determination is as follows:

1) If the company is in the distress zone, it will be given a score of 2.
2) If the company is in the gray zone, it will be given a score of 1.
3) If the company is in the safe zone, it will be given a score of 0.

The multinomial logistic regression analysis model is used in this study. According to Ghozali (2018), logistic regression analysis is a test to analyze whether the probability of the presence of the dependent variable can be predicted using the independent variable. The logistic regression model examines the influence of the independent variable on the dependent variable with ordinal or nominal data scales.

Logistic regression analysis does not require the assumption of normality of the data on the independent variables, so this analysis is generally used if the assumption of the multivariate normal distribution is not met. Multinomial logistic regression analysis is an extension of binary

(two categories) logistic regression and is used only if the dependent variable has more than two categories. Its equation in this study can be expressed in the following two equations:

$$\text{Ln}\frac{\text{P(Yi=safe zone)}}{\text{P(Yi=distress zone)}} = \text{a} + \text{b1NPL} + \text{b2LDR} + \text{b3GCG} + \text{b4ROA} + \text{b5CAR} + \text{b6Inflation} + \text{e}$$

$$\text{Ln}\frac{\text{P(Yi=gray zone)}}{\text{P(Yi=distress zone)}} = \text{a} + \text{b1NPL} + \text{b2LDR} + \text{b3GCG} + \text{b4ROA} + \text{b5CAR} + \text{b6 Inflation} + \text{e}$$

4. RESULTS

Descriptive statistics used in this study aim to describe research data in tabulated form so that it is easy to interpret. Descriptive statistical analysis used in this study is the maximum value, minimum value, mean, and standard deviation of each variable. The data analysis carried out in this study consisted of three stages: descriptive statistics, multinomial logistic regression analysis and hypothesis testing.

4.1. Descriptive Statistic

The descriptive statistics results of the dependent variable and independent variable can be seen in Table 4 below, providing a comprehensive overview of the research data.

Table 4: Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
NPL	215	0.00%	22.27%	3.69%	2.71%
LDR	215	39.33%	466.78%	90.42%	37.76%
GCG	215	1	4	2.13	0.49
ROA	215	-15.89%	13.58%	0.80%	3.15%
CAR	215	9.01%	148.28%	25.38%	16.06%
Inflation	215	2.04%	3.81%	3.12%	0.61%
Z''-Score	215	0	1	0.23	0.420

Based on Table 3, it can be concluded that the NPL variable has an average value of 3.69%, which indicates that most banks in Indonesia can maintain the level of bad loans below 5%, according to the limit set by Bank Indonesia. The LDR variable has an average value of 90.42%, which shows that most banks in Indonesia can maintain a loan-to-deposit ratio above 78% and below 92%, according to the limits set by Bank Indonesia. The GCG variable has an average of 2.13, showing that most banks in Indonesia have implemented good corporate governance well. The ROA variable has an average value of 0.80%, which shows that most banks in Indonesia do not yet have a good profitability performance measured by return on assets. The CAR variable has an average value of 25.38%, which shows that most banks in Indonesia can maintain a capital adequacy ratio above 8%, according to the limit set by the Financial Services Authority. Finally, the average value of the inflation rate variable is 3.12%, which indicates that the inflation rate during the observed period is still classified as mild inflation.

4.2. Multinomial Logistic Regression Analysis

Multinomial logistic regression is conducted to determine whether the independent variables in this study can contribute to the probability of a company having the potential to go bankrupt, divided into three categories: distress zone, gray zone, and safe zone. The steps for testing the multinomial logistic regression model are the Overall Model Fit Test, Goodness of Fit Test, the Determination Coefficient Test (Pseudo R-Square), and the Prediction Accuracy Test (Classification Table).

Table 5: Overall Model Fit Test Result

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	395.568			
Final	279.427	116.142	12	0.000

The overall model fit test result is shown in Table 5. This result shows that the value of -2 log likelihood only with an intercept of 395.568, and by including the independent variable, the value decreases to 279.427 and the significance is at p=0.00. This means that inputting the independent variable provides better accuracy for predicting the potential for bankruptcy.

Table 6: Goodness of Fit Test Result

	Chi-Square	df	Sig.
Pearson	18003.278	416	0.000
Deviance	279.427	416	1.000

The goodness of fit test result is shown in Table 6. This result shows that the results of the goodness of fit test. This study uses the Deviance Sig value of 1.00, which means the model is fit (feasible to use) with a chi-square of 279.427. This is because the P-value > 0.05 means the H_0 which state the model fits with the data, is accepted.

Table 7: Coefficient of Determination Test Result (Pseudo R-Square)

Cox and Snell	0.417
Nagelkerke	0.496
McFadden	0.294

Pseudo R-Square (R^2) is interpreted in the same way as R^2 in multiple linear regression. In multinomial logistic regression, it can be seen in the Nagelkerke value. The test results in Table 7 show that the Nagelkerke value is 0.496. This result indicates that the independent variables have a predictive power of 49.6% for bankruptcy, while other variables outside the model explain 50.4%.

Table 8: Prediction Accuracy Test Result (Classification Table)

Observed	Predicted			
	Safe Zone	**Gray Zone**	**Distress Zone**	**Percent Correct**
Safe Zone	10	7	2	52.6%
Gray Zone	1	100	12	88.5%
Distress Zone	0	28	55	66.3%
Overall Percentage	5.1%	62.8%	32.1%	76.7%

The prediction accuracy is used to determine the correct and incorrect estimated values. In a perfect model, all cases will be on the diagonal with a forecasting accuracy of 100% (Ghozali, 2018). The determination of prediction accuracy is seen through the classification table. Based on the prediction accuracy test result shown in Table 8, it can be concluded that:

1) The prediction of observations of companies in the safe zone is 19. At the same time, the actual result shows ten observations of companies that are in the safe zone (no potential for bankruptcy) with an accuracy percentage of 52.6%.
2) The prediction observations of companies in the gray zone are 113 companies. At the same time, the actual result shows 100 observations of companies in the gray zone (cannot be concluded) with an accuracy of 88.5%.
3) The prediction of observations of companies in the distress zone is 83. At the same time, the actual result shows 55 observations of companies that are in the distress zone (potentially bankruptcy) with an accuracy of 66.3%.
4) The accuracy of the overall model in predicting a company's bankruptcy is 76.7%.

4.3. Hypotheses test

Hypothesis testing was carried out to obtain valid analysis results and support this study's hypotheses. This section provides the results of hypothesis testing consisting of the significant simultaneous test (likelihood ratio tests) and significant partial test (parameter estimates).

In multinomial logistic regression, the significance of the simultaneous regression coefficient is tested using the Likelihood Ratio Tests. Likelihood Ratio Tests show the contribution of each

independent variable to the model. The sig value used in this study is 0.05. The sig value is also called the p-value (probability value). The simultaneous significant test result is shown in the Table 9.

Table 9: Simultaneous Significant Test Result (Likelihood Ratio Test)

Effect	Model Fitting Criteria -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	df	Sig.
Intercept	304.087	24.661	2	0.000
NPL	280.524	1.097	2	0.578
LDR	289.568	10.141	2	0.006
GCG	286.855	7.429	2	0.024
ROA	285.250	5.823	2	0.054
CAR	345.140	65.714	2	0.000
Inflation	280.135	0.708	2	0.702

Table 9 shows that the variables influencing the model are LDR, GCG, and CAR ($p < 0.05$). Other variables, NPL, ROA, and inflation rates, do not affect the model because they have no significant value ($p > 0.05$).

In multinomial logistic regression, the significance of the partial regression coefficient can be tested using the parameter estimates test. Parameter estimates test is used to analyze how the independent variables affect the probability of occurrence of the dependent variable. The results of this test will determine the probability of the presence of the dependent variable by the predetermined category. In this study, the independent variable will show how much influence it has on the probability that the bank is in the distress zone, gray zone, and safe zone. The partial significant test result is shown in the Table 10.

Table 10: Partial Significant Test Result (Parameter Estimates)

Z''-score		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Safe Zone	Intercept	-19.247	5.074	14.390	1	0.000			
	NPL	0.069	0.147	0.221	1	0.638	1.072	0.803	1.429
	LDR	0.047	0.018	6.920	1	0.009	1.048	1.012	1.086
	GCG	1.761	0.868	4.114	1	0.043	5.820	1.061	31.917
	ROA	0.348	0.151	5.315	1	0.021	1.416	1.053	1.903
	CAR	0.216	0.037	33.560	1	0.000	1.241	1.153	1.334
	Inflation	0.134	0.563	0.056	1	0.812	1.143	0.379	3.444
Gray Zone	Intercept	-10.306	2.763	13.917	1	0.000			
	NPL	-0.061	0.092	0.438	1	0.508	0.941	0.785	1.127
	LDR	0.030	0.012	6.444	1	0.011	1.031	1.007	1.055
	GCG	1.137	0.479	5.631	1	0.018	3.118	1.219	7.975
	ROA	0.204	0.126	2.639	1	0.104	1.226	0.959	1.569
	CAR	0.133	0.031	18.594	1	0.000	1.142	1.075	1.214
	Inflation	0.246	0.297	0.685	1	0.408	1.279	0.714	2.290

Based on the Table 10, it can be concluded that two multinomial logistic regression equations are as follows:

$$\text{Ln}\frac{\text{P(Yi=}\textit{safe zone}\text{)}}{\text{P(Yi=}\textit{distress zone}\text{)}} = -19.247 + 0.069\text{NPL} + 0.047\text{LDR} + 1.761\text{GCG} + 0.348\text{ROA} + 0.216\ \text{CAR} + 0.134\ \text{Inflation}$$

$$\text{Ln}\frac{\text{P(Yi=}\textit{gray zone}\text{)}}{\text{P(Yi=}\textit{distress zone}\text{)}} = -10.306 - 0.061\text{NPL} + 0.030\text{LDR} + 1.137\text{GCG} + 0.204\text{ROA} + 0.133\ \text{CAR} + 0.246\ \text{Inflation}$$

Table 9 shows that in the safe zone category, only the LDR, GCG, ROA and CAR variables have a significant effect statistically toward the potential for bankruptcy in the banking sector with a significance level of 5%, while the non-performing loan variables and the level of inflation do not affect bankruptcy in the banking sector. Table 8 also shows that in the gray zone category, only LDR, GCG, and CAR have a statistically significant effect on the potential for bankruptcy in the banking sector with a level of 5%. In contrast, the NPL, ROA, and inflation variables do not affect the potential for bankruptcy in the banking sector.

5. DISCUSSION

The first hypothesis in this study is that NPL positively affects the potential for bankruptcy in the banking sector. This statistical test result shows that, in the safe zone category, the significance value of NPL is 0.638>0.05. In addition, in the gray zone category, the significance value of NPL is 0.508>0.05. Thus, H1 is rejected because the NPL has no significant effect statistically on the potential for bankruptcy in the banking sector. This result is in line with some research by Labita and Yudowati (2020), Kuncoro and Agustina (2017), Andari and Wiksuana (2017) that the NPL variable does not affect the potential for bankruptcy in the banking sector statistically. This result also indicates that the NPL does not indicate potential bankruptcy. The low NPL ratio suggests that many non-performing loans show the bank's declining soundness. However, NPL cannot be used as a proxy to predict the potential for bankruptcy. Other productive assets can be a source of bank income apart from credit. Thus, even though the NPL ratio increases and other earning assets continue to increase, the bank will remain safe to a certain extent.

The second hypothesis in this analysis is that LDR has a statistically negative effect on the potential for bankruptcy in the banking sector. This statistical test result shows that the LDR variable in the safe zone category affects the probability that the bank is in the safe zone is higher than the distress zone (significance value of 0.009<0.05). In the gray zone category, the LDR affects the probability that the bank in the gray zone is higher than the distress zone (significance value of 0.011<0.05). Thus, H2 is accepted because the LDR has a statistically negative effect on the potential for bankruptcy in the banking sector. This result is in line with the result of Habbi and Harto (2019) research shows that the LDR variable has a statistically negative effect on the potential for bankruptcy in the banking sector. This result also indicates that LDR can be used as a proxy to predict bankruptcy. LDR represents the bank's ability to its liquidity and its ability to earn income through lending. The smaller the LDR ratio will show the bank's low effectiveness in obtaining income through lending so that more money is unemployed. This condition is one of the signs of a low level of bank soundness. If the bank cannot overcome the problem, then the possibility of the bank going bankrupt will increase.

The third hypothesis in this research is that GCG has a statistically negative effect on the potential for bankruptcy in the banking sector. This statistical test result shows that the self-assessment good corporate governance variable in the safe zone category affects the probability that the bank is in the safe zone is lower than the distress zone (significance value of 0.043<0.05). In the gray zone category, the GCG self-assessment variable affects the probability that the bank is in the gray zone is lower than the distress zone (significance value of 0.018<0.05). Thus, H3 is accepted because the variable of self-assessment of GCG has a statistically negative effect on the potential for bankruptcy in the banking sector. This result is in line with the outcome of research from Mahmud et al. (2021), Rosiana et al. (2020) that GCG has a statistically negative effect on the potential for bankruptcy in the banking sector. These results also indicate that the self-assessment of GCG can be used as a proxy to predict bankruptcy. This follows the theory that the better the implementation of GCG, the more focused the bank will be on achieving the bank's goals. Companies with good management governance show a good relationship between stakeholders. This conducive condition will improve the bank's performance.

The fourth hypothesis in this research is that ROA has a statistically negative effect on the potential for bankruptcy in the banking sector. This statistical test result shows that the ROA variable in the safe zone category affects the probability that the bank is in the safe zone is higher than the distress zone (significance value of 0.021<0.05). In the gray zone category, the significance value of ROA is 0.104>0.05. There are differences in results in the two types, which can be interpreted that ROA may not necessarily be used as a predictor of potential bankruptcy. Thus, H4 is rejected because the ROA has no statistically significant effect on the potential for bankruptcy. This study's results align with Rahmania and Hermanto (2014) research that ROA has no statistical impact on the potential for bankruptcy in the banking sector. This result also indicates that ROA cannot be used as a proxy to predict bankruptcy. ROA measures the bank's ability to gain profits using its assets. The better the ROA value, the better its performance to achieve profits using its assets. ROA also shows that the lower its ability to earn profits through its assets, the bank's health will decrease. However, suppose the bank still has good capital adequacy to handle the risk of its risky assets. In that case, ROA will not have a significant effect statistically on the potential for bankruptcy in the banking sector.

The fifth hypothesis in this analysis is that CAR has a statistically negative effect on the potential for bankruptcy in the banking sector. This statistical test result shows that, in the safe zone category, the CAR variable affects the probability that the bank is in the safe zone is higher than the distress zone (significance value of 0.000<0.05). In the gray zone category, the CAR affects the probability that the bank is in the gray zone is higher than the distress zone (significance value of 0.000<0.05). Therefore, H5 is accepted because the CAR variable negatively affects the potential for bankruptcy in the banking sector. This outcome is in line with the results of research from Maisarah et al. (2018), Khadapi (2017), Kuncoro and Agustina (2017) that CAR has a statistically negative effect on the potential for bankruptcy in the banking sector. This result also indicates that CAR can be used as a proxy to predict bankruptcy. This is because CAR shows the strength of a bank through its capital adequacy to absorb possible losses from risky assets. The higher the CAR value, the better the bank's ability to bear the risk of each asset. Banks will be more protected from bankruptcy if the bank can cover losses from risky assets. On the other hand, a bank with a low CAR value that cannot cover losses due to its risky assets has the potential to experience bankruptcy.

The sixth hypothesis in this research is that the inflation rate has a statistically positive effect on the potential for bankruptcy in the banking sector. This statistical test result shows that, in the safe zone category, the significance value of the inflation rate is 0.812>0.05. In addition, in the gray zone category, the significance value of the inflation rate is 0.408>0.05. This result shows that the inflation rate variable does not statistically affect the potential for bankruptcy in the banking sector. Thus, H6 is rejected because the inflation rate variable does not statistically affect the potential for bankruptcy in the banking sector. This outcome is in line with the results of research from Wafi, Mardani, and Wahono (2021), and Nilasari and Ismunawan (2021) that the inflation rate does not affect the potential for bankruptcy in the banking sector statistically. This result also indicates that the inflation rate cannot be used as a proxy to predict bankruptcy. This is because the inflation rate during the 2016-2020 period was 1-3%, so it was still mild (less than 10%/year). In addition, a country with an inflation rate of 1-3% indicates that the country has a healthy economy and its people have strong purchasing power. If the inflation rate is stable and low, then Bank Indonesia

will maintain a low benchmark interest rate, which high demand for credit should follow. Thus, the inflation rate during the 2016- 2020 period did not cause the bank to go bankrupt.

6. CONCLUSION, LIMITATIONS, AND SUGGESTIONS

6.1. Conclusion

This study examines the effectiveness of RGEC-based bank soundness and inflation rate in predicting the potential for bankruptcy in the Indonesian banking sector during 2016-2020. RGEC-based bank soundness consists of 4 assessment factors: risk profile, good corporate governance, earnings, and capital. The variables in this study are non-performing loans (NPL) and loan to deposit ratio (LDR) as proxies for risk profile factors assessment, the results of self-assessment of corporate governance as a proxy for good corporate governance factor assessment, return on assets (ROA) as a proxy for earnings factor assessment, and capital adequacy ratio (CAR) as a proxy for capital factor assessment, as well as the annual inflation rate for the 2016-2020 period. Based on the results of this study that has been carried out through multinomial logistic regression tests, it can be concluded that the variables that can affect the potential for bankruptcy of the banking sector are LDR, GCG, and CAR. Other variables, which are NPL, ROA, and inflation rate, do not affect the potential for bankruptcy in the banking sector.

6.2. Limitation and suggestions

The limitation of this study is that this study only use return on asset ratio as proxy for earnings factor assessment. This study does not use the interest rates and exchange rates to measure the effect of macroeconomic on bank bankruptcy due to the limitations for the author. This study contributes to the bankruptcy literature and risk management policy. These results recommend that if banking management wants to predict and anticipate bankruptcy based on the bank's soundness, it can be considered to see and maintain the LDR, self-assessment of good corporate governance, and CAR.

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