

Bankruptcy Probability Analysis of Rural Bank in Indonesia

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Abstract:- Financial Services Authority (OJK) in Indonesia has overruled licenses to 59 rural banks for the 2016-2021 period, of which 33 or 55.9% are located in Java. This study aims to formulate a rural bank bankruptcy prediction model through financial indicators included in the RGEC Model. Quantitative analysis for processing data include descriptive statistics, independent t-test and logistic regression. The number of secondary data amounted to 66 (33 Bankrupt rural bank and 33 Healthy rural bank). The results showed that the variables of Non-Performing Loan (NPL), Return On Asset (ROA) and Return On Equity (ROE) had a significant effect on the probability of rural bank bankruptcy while the Allowance for Write-off of Productive Assets (PPAP), Net Interest Margin (NIM) and The Capital Adequacy Ratio (CAR) had no significant effect. Simultaneously, the entirety of independent variables affects the probability of bankruptcy of the rural bank.

Keywords:- BPR, Bankruptcy, Logistic Regression.

I. INTRODUCTION

Rural bank in Indonesia has limitations in carrying out its role and function as a wishful thinking institution. It is different from commercial banks. Based on Law No. 10 of 1998, rural bank is only allowed to accept deposits in the form of time deposits, savings/deposits that are equated with it and not it is allowed to collect third party funds in the form of current accounts because rural bank is not a cash deposit maker, conducting business activities based on foreign exchange transactions, investment in the form of investment or insurance. The main market segmentation of rural bank financial services is Micro, Small and Medium Enterprises (MSMEs) which obviously have a higher risk compared to large-scale companies. This causes interest on deposits and loans in rural banks to be higher than that of commercial banks and has higher risk consequences.

The resilience of rural banks depends on the ability of management to manage various business risks. Micro-segmentation is a market that has not been widely optimized, especially areas that are difficult for banking financial institutions to access. Various alternative financial services such as credit unions, cooperatives, loan sharks and even commercial banks compete to gain customer trust. One of the foundations of the government to issue regulations related to

the National Financial Inclusion Strategy (SNKI) is that many Indonesians have difficulty accessing financial products and services where the number is more than 80 million people (Ministry of Finance, 2020).

Rural bank not only faces external challenges such as market competition with other Microfinance Institutions (MFIs) both legal and illegal, but also in internal aspects such as organizational governance, implementation of Standard Operating Procedures (SOPs) and insufficiently qualified HR management. Therefore, although the establishment of a rural bank is not so difficult, it may become business risk in the financial sector, along with the explained segmentation and market structure, it is not easy to run.

The difficulty of rural banks to survive can be seen in the data on the decline of the number of rural banks since the 2014-2021 period. Data from the Central Statistics Agency showed that in that period there was a decrease in the number of rural banks in Indonesia by 10.65% but there was an increase in the number of offices by 19.9%. The data provides information that needs to be further studied regarding the resilience of rural banks in certain periods in Indonesia. It can also indicate the existence of a rural bank market structure in some areas that is oligopoly or controls the market share of the micro sector and or low-income people. Therefore, Financial Institutions or other competitors, especially rural bank cannot compete and eventually experience bankruptcy.

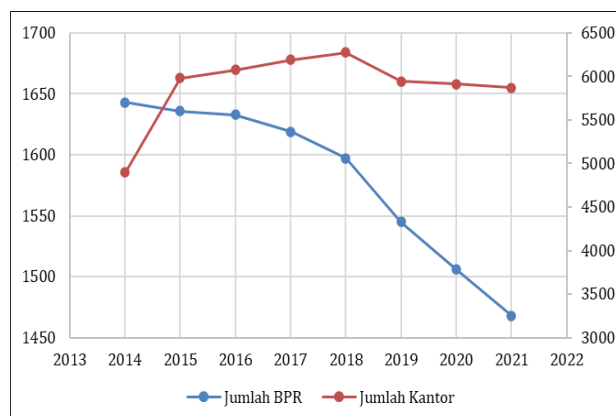


Fig. 1:- Number of Rural Banks and Number of Rural Bank Offices in Indonesia (2014-2021). Source: Central Statistic Agency, 2020 (processed)

One of the crucial financial indicators to measure the performance of a bank is Non-Performing Loan (NPL). A high NPL indicates that many customers are not disciplined in paying installments or commonly known as bad debts. If the problem is not resolved immediately, it will disrupt the bank's capital adequacy and reduce the loan disbursement ratio in the future. In the short term period, a small lending ratio will reduce the bank's income and may lead to bankruptcy if the bank is unable to cover operating costs. The authors recapitulated as many as 1,517 rural bank data from the Financial Services Authority (OJK) in 2019. The results of the processed data showed that 68% of them had Non-Performing Loans of more than 5% (above the threshold).

In the last decade, starting from 2012-2021, all liquidated banks are rural banks, both conventional and sharia. The Indonesia Deposit Insurance Corporation (IDIC) noted that there are 60 rural banks that have been or are in the process of being liquidated from 2012-2021. The data shows that there are at least six rural banks that are liquidated annually.

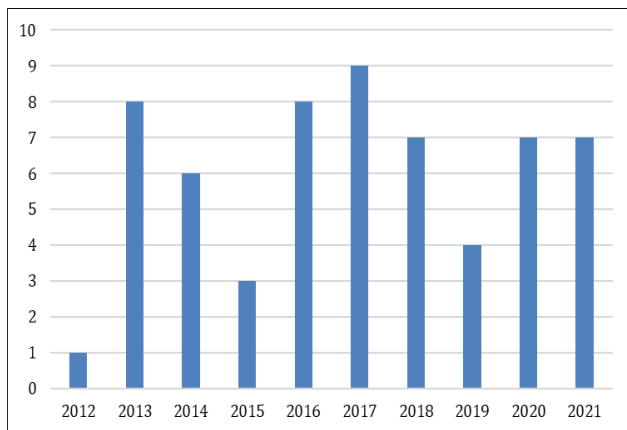


Fig. 1:- Rural Bank Liquidated by Indonesia Deposit Insurance Corporation (2012-2021).
Source: IDIC, 2022 (processed)

To identify the problem in more depth, the authors map proportionally several indicators of rural bank development based on the province/archipelago area. The Indonesian Banking Statistics Report in May 2022 shows that the number of Non-Performing Loans of all rural bank in Java island is 6.4 Trillion rupiah from 9.9 Trillion rupiah or 65.06% of the total NPL of rural bank in Indonesia. This data needs to be a concern for stakeholders because 61.37% of the total collection of rural bank third-party funds in Indonesia is on the island of Java.

The number of rural bank that have been revoked their business licenses by the Financial Services Authority (OJK) in the 2016-2021 period is 59 with details by province as follows.

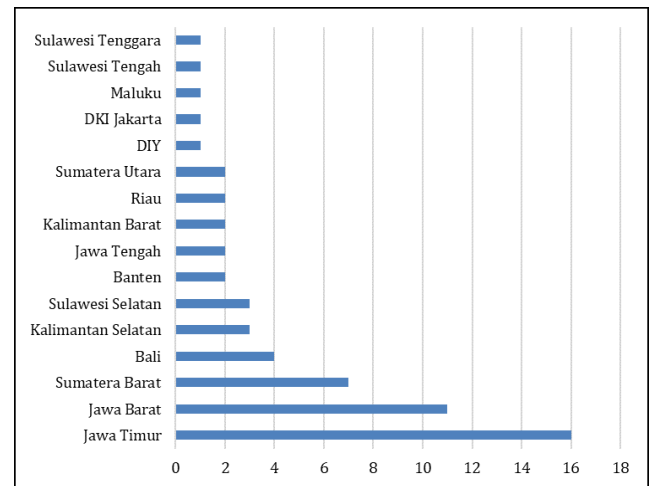


Fig. 3:- Number of Rural Bank License Revocations in the 2016-2021 Preiodperiod.

Source: OJK Publication report, 2022 (processed)

The data shows that 55.9% or 33 of the 59 rural banks that were revoked their licenses are located in Java Island, Indonesia. Regional analysis is important to be studied because it is closely related to the social and cultural elements of the community with lower-middle economic status as the main market share of rural banks in Indonesia. Therefore, this is the basis for determining the sampling data as well as the limitations considered in this study.

This study empirically analyzed rural bank performance data using the RGEC Model to predict the probability of bankruptcy of a rural bank. Comparison is made between rural banks that are included in the bankruptcy category and the status of business license revocation by OJK and rural bank categories that are healthy and still operating until 2021. Through the attention of stakeholders to financial ratios that significantly affect the probability of bankruptcy, it is expected to reduce the number of bprs liquidated in the future

II. LITERATURE REVIEW

A. Rural Bank in Indonesia

Based on the Law of the Republic of Indonesia Number 10 of 1998, rural bank is a bank that carries out business activities conventionally that in it's activities does not provide services in payment traffic. The implementation of rural bank products is further regulated by OJK in POJK Number: 25 / POJK.03 / 2021 which states that basic and advanced products to support rural bank's business are in the form of:

- Fundraising
- Disbursement of funds
- Placement of funds; and/or
- Other basic activities

Explicitly, Central Bank of Indonesia (BI) Regulation Number: 6/22/PBI/2004 states that rural banks are part of the national banking system and are aimed at improving financial services, especially to micro-entrepreneurs, small and medium. Based on Indonesia Banking Statistics, as of

May 2022, the composition of Third Party Funds managed in the form of Deposits (69.67%) and Savings Accounts (30.33%). Lending is still dominated by allocations for Working Capital or Modal Kerja (46.86%) and Consumption or Konsumsi (45.49%) while for Investment or Investasi only (7.66%).

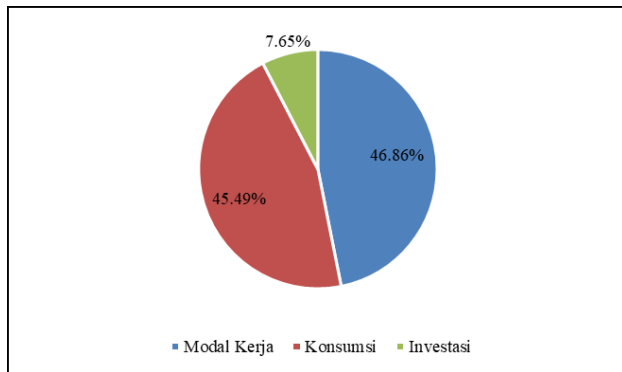


Fig. 4:- Credit Composition of Rural Banks. Source: Indonesia Banking Statistics, May 2022

Of the total loans disbursed by rural bank from May 2021-May 2022 (1 Year) there was an increase of 7.7% from 113.3 Trillion Rupiah to 122.1 Trillion Rupiah. In the midst of competition with other Microfinance Institutions such as Savings and Loan Cooperatives, credit unions and digital financial services, this growth is still quite good although it still has to be develop products according to market or customer needs.

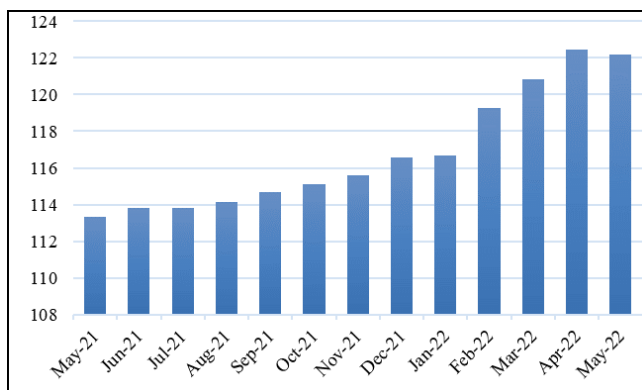


Fig. 5:- Development of Total Loan Disbursed by Rural Banks. Source: Indonesia Banking Statistics, May 2022

OJK as the supervisory party, issued OJK Regulation No. 3/POJK.03/2022 relating to the Assessment of the Health Level of Rural Banks and Sharia Rural Banks. In the regulation, it is stated that conventional rural bank and sharia rural bank are required to conduct a Health Level assessment using a risk approach with the scope of assessment of factors, namely:

- Profile Risk;
- Governance;
- Rentability;
- Capital

In addition, the risk management aspects of rural bank include six aspects, namely:

- Credit Risk
- Operational Risk
- Compliance Risk
- Liquidity Risk
- Reputation Risk
- Strategic Risk

The assessment of the risk profile of rural banks is adjusted to the amount of core capital, as follows:

- rural bank with a core capital of less than IDR 50,000,000,000.00 (fifty billion rupiah) apply a minimum of 4 types of risk (credit, operations, compliance and liquidity)
- rural bank with a core capital of less than IDR 50,000,000,000.00 (fifty billion rupiah) but has products, services, other activities that increase mandatory risk exposure, then applies all types of risk
- rural bank with a core capital of at least IDR 50,000,000,000.00 (fifty billion rupiah) apply all types of risks

Several studies have discussed risk management and rural bank performance. Pratiwi and Suryantini (2018) stated that liquidity, credit risk, and operational risk significantly affected profitability by 59.4%. In line with this study, Sugiarta et al (2021) argue that Non-Performing Loans and Operating Costs to Operating Income (BOPO) which show customer default conditions are negatively correlated with Return On Asset (ROA) indicator significantly. To manage credit risk, for example, rural bank management must pay attention to the supervision and implementation of operational standards of risk management, improvement of human resources (Arih, 2017) or in liquidity management , training can be held for the human resources involved, especially for prospective rural bank directors (Aini et al, 2022).

There are many development challenges that rural bank has to face, including; 1) business competition, 2) adaptation of people's business credit (KUR) policy, 3) technological competition, 4) macroeconomic conditions, 5) socio-cultural conditions, 6) regulatory alignment (Jaya, 2020). If rural bank management cannot anticipate it properly and adaptively, then in the future, the bankruptcy rate of rural bank has the potential to increase because it does not find a market-fit product that suits the market.

B. Bankruptcy

According to the Great Dictionary of the Indonesian Language (KBBI), the word "bankrupt" means to suffer heavy losses until it falls (about companies, shops, and so on). Synonyms are often used to declare the cessation of operation of a company's operations, and another is bankruptcy. On it's use the conditions of bankruptcy are worse compared to bankruptcy. The condition of bankruptcy is used when a company for example, cannot pay its debts to creditors while in a state of bankruptcy, the company can still operate despite the conditions unhealthy finances because profits cannot recoup losses.

Regulations regarding insolvency are regulated in Law No. 37 of 2004 concerning Insolvency and Postponement of Debt Payment Obligations. The regulation explains that to obtain a declaration of insolvency from the Commercial Court there are several processes that must be carried out:

- Filing of insolvency to the court
- Submission of declaration of bankruptcy application
- Insolvency application hearing
- Summons of debtors and creditors by the court
- Court rulings related to insolvency

In banking cases, the Indonesia Deposit Insurance Corporation (LPS) has the authority to establish a settlement policy for failed banks that have no systemic impact or the handling of banks that fail to have a systemic impact in accordance with Law No. 24 of 2004 concerning the Indonesia Deposit Insurance Corporation. This was done after the OJK revoked the business license of a problematic bank. This authority is stated in Law No. 21 of 2011 concerning the Financial Services Authority.

Furthermore, LPS took over the bank's shares and assets to carry out security and prepare for the liquidation process. At this stage, deposits that are worth paying will be returned to the customer to the maximum extent of which is by the sale of assets controlled by the bank. Settlement of handling of problem banks can also be done through an Intermediary Bank. The process of transferring ownership to other parties/investors is carried out after solvency problems are resolved openly and transparently. The stages of the intermediary bank resolution method are as follows:

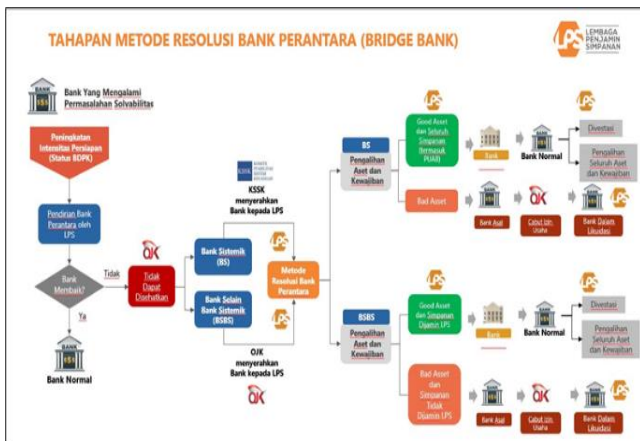


Fig. 6:- Stages of Intermediary Bank Resolution Method. Source: LPS, 2022

Based on data obtained from the Indonesia Deposit Insurance Corporation, in the period (2011-2021) there were 86 banks that had been/liquidated and all of them were conventional rural bank or sharia rural bank. In the last five years (2017-2021) an average of eight conventional rural bank or sharia rural bank in the liquidation. This should be a concern for all stakeholders in the banking industry, especially rural banks.

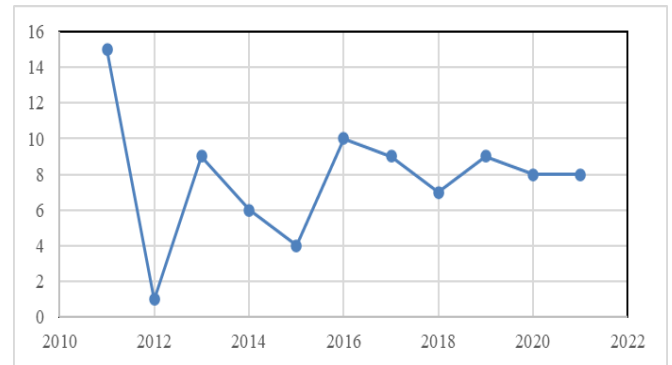


Fig. 7:- Number of Banks Liquidated by LPS in 2011-2021. Source: LPS, 2022

C. RGEC Indicators

The assessment of the level of banking health has been previously determined through Central Bank of Indonesia (BI) Regulation No. 6/10/PBI/2004 and SE No. 6/23/DPNP. The indicators used in the rules are the CAMELS (Capital, Asset Quality, Management, Earnings, Liquidity, Sensitivity to Market Risk) method. Most are measured through a quantitative approach in financial ratios except for a few aspects such as regarding management and sensitivity to market risks. After that, on October 25, 2011, in accordance with Central Bank of Indonesia (BI) Circular Letter 13/24/DPNP, the banking health assessment was changed from the CAMELS Method to RGEC (Risk Profile, Good Corporate Governance, Earnings, Capital). This is done as an effort to increase the attention of stakeholders to risk management and the implementation of Good Corporate Governance better.

Some of the differences seen from the model change from CAMELS to RGEC, including; the inclusion of operational risk in the risk profile assessment whereas previously the CAR calculation only used credit and market risk. Return On Asset (ROA) Ratio, NPL, RORA, PPAP, As for the RGEC model, it is not included in it the valuation of Total Assets, while the NPL indicator is included in the measurement of the risk profile. Furthermore, the assessment of Good Corporate Governance is considered separately not combined with Net Profit Margin (NPM) and the measure of Net Interest Margin (NIM) is a measurement indicator in the aspect of Earnings. The Loan to Deposit Ratio (LDR) indicator is also a measurement of the risk profile that was previously included in the indicator of measuring sensitivity to market risk in the CAMELS Model, (Kusumawardani, 2014). Figure 8 explain the differences between camels and RGEC models

Indicator	CAMELS	RGEC
Capital	Using credit and market risk	Using credit, market, and operational risks
Credit Risk	Based on collectability provisions	Based on data on losses that have occurred
Liquidity	Centered on the LDR ratio	All aspects that affect liquidity
Market Risk	Focus on management systems Pass	The presence of business parameters and policies that affect market risks
Management	Management and GCG become one	GCG and other compliance management separate
Earnings	Simple calculation	The valuation ratio is linked to the asset

Fig. 8:- Differences between CAMELS and RGEC Model.
Source: Anugrasandi (2016)

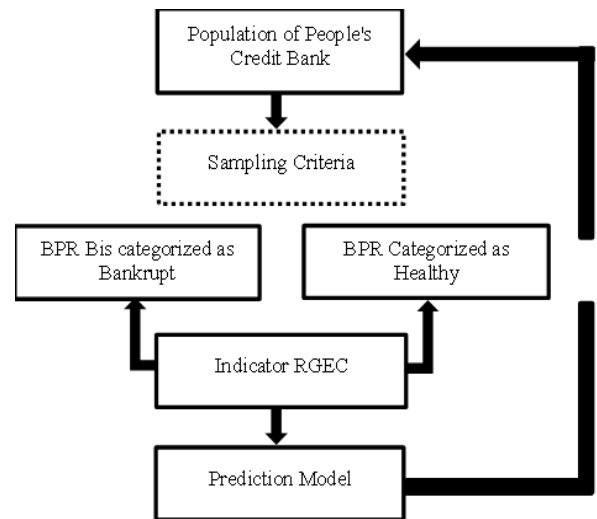


Fig. 9:- Theoretical Framework

Some studies compare the differences in the application of the CAMEL and RGEC models in assessing the health of a bank. Indrawati (2015) stated that there are significant differences in the ratio of BOPO, LDR and NPL before and after Central Bank of Indonesia (BI) regulation No. 13/1/PBI/2011. The study of Noviani and Somantri (2021) using data consist of financial statements during 2019-2020 from Bank Rakyat Indonesia's (BRI) as one of state owned commercial bank showed that there were significant differences between CAMELS models that use CAR, NPM, NIM and RGEC which use BOPO, NIM and CAR when conducting health assessments. Different results were delivered by Sihombing (2021). According to him, neither CAMELS nor RGEC have too much difference in the health assessment of a bank listed on the Indonesia Stock Exchange for the 2016-2019 period.

III. THEORITICAL FRAMEWORK

This study aims to create a model for predicting the bankruptcy of the rural bank. From the entire rural bank population, the author will divide the existing sample into two categories, namely rural bank categorized as bankrupt and rural bank caterozied as healthy. This is done purposively through several specified criteria. The RGEC indicator becomes an independent variable to empirically test which aspects affect the prediction of bankruptcy of a rural bank. The result of the test is a model that can be used to predict the instability of a rural bank through the bank's historical data.

A. Hypothesis

The hypotheses in this study are as follows:

- H1 : Non-Performing Loan (NPL) indicators affect the probability of rural bank bankruptcy
- H2 : The Allowance indicator for the Write-off of Productive Assets (PPAP) affects the probability of rural bank bankruptcy
- H3 : Return on Asset (ROA) indicator affects the probability of rural bank bankruptcy
- H4 : Return On Equity (ROE) indicator affects the probability of rural bank bankruptcy
- H5 : Net Interest Margin (NIM) indicator affects the probability of rural bank bankruptcy
- H6 : The Capital Adequacy Ratio (CAR) indicator affects the probability of rural bank bankruptcy

IV. ANALYSIS AND DISCUSSION

Data processing is carried out through several stages to ensure the validity and reliability of the model to be formulated after statistical testing is carried out, as follows:

- Data verification, ensuring the rural bank sample complies with predetermined criteria
- Assumption testing (if needed)
- Elimination of data and outliers
- Statistic testing, (Logistic Regression and Independent T-Test)
- Data Information

Some of the relevant indicators in the RGEC Model such as Loan to Deposit Ratio (LDR), Net Interest Margin (NIM), Operating Costs and Operating Income (BOPO), Cash Ratio and Total Assets are not included in the model to avoid estimation bias because the predictors are too many but do not significantly affect the model. Therefore, this study suffices several independent variables that have an influence and have a significant contribution in explaining the dependent variables.

The total sampling data used in the study was 66 rural bank (33 bankrupt and 33 healthy). This number has met a minimum sample of 64 with the total population of rural bank in Java Island in 2022 is 870 with a Confidence Level value of 90% and Margin of Error 10%. The entire data is used in logistic regression testing. However, in the independent t-test, only 48 rural bank were used because it was necessary to eliminate the outlier when testing the normality and homogeneity of the data.

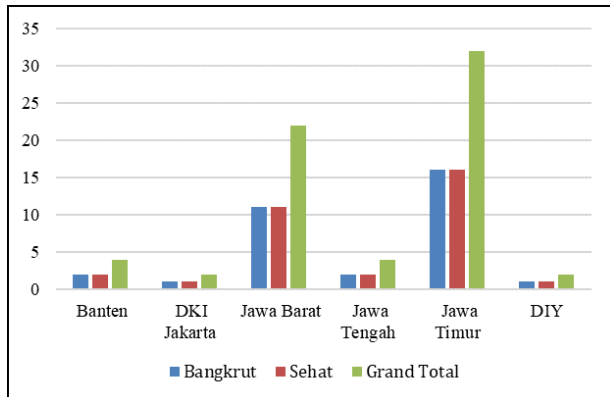


Fig. 10:- Number of Research Samples of Each Province in Indonesia. Source: data processing results, 2022

Based on the proportion of research data based on regionality, East Java Province has the largest number with a total of 32 rural bank while the province with the least number is the Yogyakarta Special Region Province, which is two rural bank. The second largest province is West Java with 22 rural banks. However, when viewed from the number of NPLs by location. The provinces of Central Java, West Java and East Java are the top three, the provinces with the highest NPL value, namely 2.8 Trillion Rupiah, 1.5 Trillion Rupiah and 1.1 Trillion Rupiah, respectively. Therefore, even though Central Java Province has a number of rural bank that have their business licenses revoked, the value of NPLs is high and has the potential to increase the risk of bankruptcy if not managed immediately effectively and efficiently.

A. Descriptive Statistics

Description	Statistical Value					
	NPL	PPAP	RoA	ROE	Before	CAR
Mean	21.7048	154.0992	-7.367	-8.7633	15.5026	2.6282
95% Confidence Interval for Mean Lower Bound	15.8900	94.7875	-14.266	-38.7375	13.0597	-60.5372
95% Confidence Interval for Mean Upper Bound	27.5197	213.4110	-.467	21.2108	17.9455	65.7936
5% Trimmed Mean	18.7540	114.8498	-3.109	-1.7944	15.9731	31.1504
Median	13.5950	100.4700	.730	1.2313	15.4854	20.6250
Variance	559.503	58.211	787.711	14.866	98.752	66.021
Std. Deviation	23.65381	241.27085	28.0662	121.93	9.93741	256.946
Minimum	.14	35.38	-199.1	-681.24	-25.61	-2013.48
Maximum	100.00	1981.38	15.5	538.42	32.73	196.71
Range	99.86	1946.00	214.7	1219.66	58.34	2210.19
Interquartile Range	21.22	12.78	13.4	44.73	11.45	35.20
Skewness	1.974	6.990	-5.318	-1.448	-1.070	-7.645
Kurtosis	3.594	52.540	34.244	19.775	3.337	60.826

Table 1:- Descriptive Statistical Results

Mean is the average value of a set of datasets. Table 1 indicates several indicators that can provide a preliminary picture of the research data. The average NPL value is 21.7% with a median value of 13.5%. This figure is quite high when compared to the safe limit of NPLs in the banking industry, which is 5%. However, the variance figure is quite high at 559,503 which shows that the NPL data fluctuates quite a bit. This condition is also explained with a range value of 99.86

In contrast to the average research data in the NPL indicator, PPAP data has several outlier data that causes a high range of 1946% while the variance value and standard deviation are 100.4% each and 58%. Therefore, in the PPAP indicators, both rural banks that are categorized as bankrupt and bpr in the healthy category have differences but not in the extreme.

The revenue aspect is represented roa, roe and nim. The ROA and ROE indicators have negative average values. Based on the average data of rural banks that are categorized as healthy, it is known that the average ROA value is positive, namely 2.61% while in rural banks categorized as bankrupt, it is negative, namely -17.3%. As for the ROE indicator, the average value of healthy rural bank is positive, namely 18.2% while rural banks categorized as bankrupt is -35%. The data shows that the negative values in ROA and ROE are dominated by rural bank in the bankruptcy category. In the NIM indicator, the average value and the middle value have a fairly close value of 15%. However, the range value is still quite high at 58.3% which shows that there is outlier data on values above 30%, namely 32.7%.

CAR indicator, has a fairly wide spread. It is known that the average value is 2.62% but has a median value of 20.6% and a variance of 66,021. These differences illustrate the differences in bpr performance in managing capital resilience when performing financial services. The minimum value of -2013.48% indicates that there is outlier data on bpr thanks to the bankruptcy category.

B. Independent T-Test

➤ Assumption Test

Before conducting an independent t-test, there are several classic assumptions that must be met in order for comparisons between groups to be considered valid, namely the normality test and the homogeneity test. The normality test proves empirically that the data focuses on its average value or middle value. The homogeneity test proved that two or more groups of data compared had similar variants from the population sampling process.

Description		Unstandardized Residual
N		48
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	.32531499
Most Extreme Differences	Absolute	.123
	Positive	.123
	Negative	-.081
Test Statistic		.123
Asymp. Sig. (2-tailed)		.067 ^c

Table 2:- Normality Test (Kolmogorov-Smirnov) Results. Source: data processing results, 2022

The test results showed that the significance value of $0.067 > 0.05$ thus the research data were normally distributed. Furthermore, homogeneity testing coincides with the t-test through Levene's Test. If the significance value < 0.05 then the data is not homogeneous and the value of the test results used is the equal variances not assumed column. However, if the significance value > 0.05 indicates homogeneous data. And the test result column used is equal variances assumed. Table 2 is the result of the t-test along with a description of the homogeneity of the variants. After testing normality, the number of rural banks analyzed was 48, consisting of 21 sharia rural bank categorized as "Bankrupt" and 27 sharia rural bank in the "healthy" category.

➤ *Statistical Test Results*

Indicators	BPR	N	Mean	Std. Deviation	Std. Error Mean
NPL	Bankrupt	21	26.55	15.58	3.400
	Healthy	27	8.03	5.49	1.057
PPAP	Bankrupt	21	102.20	3.66	.80
	Healthy	27	111.68	26.50	5.10
Roa	Bankrupt	21	-8.05	9.23	2.01
	Healthy	27	2.5	3.75	.72
ROE	Bankrupt	21	-18.15	47.0	10.27
	Healthy	27	16.30	21.33	4.10
Before	Bankrupt	21	13.64	7.26	1.58
	Healthy	27	18.29	7.56	1.45
CAR	Bankrupt	21	31.93	45.55	9.94
	Healthy	27	40.40	28.86	5.55

Table 3:- Independent T-Test Group Statistics. Source: data processing results, 2022

Table 3 describes the comparison between rural bank categorized as "Bankrupt" and "Healthy" category in each indicator. On average, the NPL value of Healthy rural bank is 8.03% lower than that of Bankrupt rural bank, which is 15.58%. Another risk profile indicator, namely PPAP, also shows that Healthy rural bank has a higher average PPAP value of 111.68 compared to Bankrupt rural bank which is worth 102.20. Comparison in this aspect of risk profile shows that healthy rural bank have a lower risk and have anticipatory steps in the form of reserves that can compensate for losses in the year walked.

In the earnings aspect, the test indicators are represented in the ROA, ROE and NIM indicators. Healthy has a higher average ROA, ROE and NIM value than Bankrupt Banks. The ROA difference between the two is quite high at 10.58%. The average ROA value of Bankrupt rural bank is -8.05% which indicates the unproductiveness of rural bank assets in the Bankruptcy category for generating company's profit. As for the average Healthy rural bank, although the average value is positive, the value is not too high. Another indicator of income measurement is Return On Equity. The average ROE value of Healthy rural bank is 16.3% while in bankruptcy category banks is -18.15%. The difference between them is quite far, which is 34.46%. This should be a concern for rural bank investors if expecting a high rate of return from the invested funds. The last indicator analyzed in this study is Net Interest Margin. Healthy rural bank has a higher average NIM value than rural bank thanks to the Bankruptcy category, which is 18.69% and 13.64%, respectively.

The Capital aspect is represented by the Capital Adequacy Ratio (CAR) indicator. Healthy rural bank has a higher average CAR value compared to rural bank in the Bankruptcy category with values of 40.40% and 31.93%, respectively. The data clarifies the ability of Healthy Rural Banks to be on average better able to control risks from credit and other operational activities.

The next analysis is to look at the homogeneity of the data and the significance of the influence of indicators on the status of rural banks (Bankrupt and Healthy). Table 4.4 shows several indicators showing data that is not homogeneity because the significance value of Levene's Test $< 0.05\%$ namely in NPL, PPAP, ROA and ROE while in THE NIM and CAR indicators the significance value $> 0.05\%$ so that it can be stated that the data is homogeneous.

To find out the significance of the difference in indicators between the two groups of rural bank, it is necessary to test the hypothesis with the following references:

- if sig: $p > 0.05$ then there is no difference.
- If sig: $p < 0.05$ then there is a difference in the sig level of 5%.
- If sig: $p < 0.01$ then there is a difference in the sig level of 1%

Indicators\}		Levene's Test		T-Test for Equality of Means						
		F	Itself.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
NPL	Equal variances assumed	13.249	.001	5.746	46	.000	18.51	3.22	12.02	25.0007
	Equal variances not assumed			5.199	23.881	.000	18.51	3.56	11.16	25.86
PPAP	Equal variances assumed	4.883	.032	-1.623	46	.111	-9.47	5.84	-21.23	2.27
	Equal variances not assumed			-1.836	27.274	.077	-9.47	5.16415	-20.07	1.11
ROA	Equal variances assumed	28.279	.000	-5.422	46	.000	-10.58	1.95257	-14.51	-6.6
	Equal variances not assumed			-4.946	25.161	.000	-10.58	2.14045	-14.99	-6.17
ROE	Equal variances assumed	4.836	.033	-3.390	46	.001	-34.46	10.16	-54.92	-14.00
	Equal variances not assumed			-3.115	26.382	.004	-34.46	11.06	-57.18	-11.738
NIM	Equal variances assumed	.170	.682	-2.147	46	.037	-4.64	2.16	-9.00	-.29
	Equal variances not assumed			-2.159	43.935	.036	-4.64	2.15	-8.98	-.307
CAR	Equal variances assumed	2.059	.158	-.785	46	.436	-8.46	10.78143	-30.17	13.23
	Equal variances not assumed			-.744	32.035	.462	-8.46	11.38732	-31.66	14.72

Table 4:- Independent T-Test and Homogeneity Test. Source: data processing results, 2022

Based on the test results of Table 4, it is known that the NPL, ROA and ROE indicators are significantly different between Healthy rural bank and Bankrupt rural bank. This is evidenced by the significance level value of < 1%. The PPAP and NIM indicators each significantly distinguish healthy rural banks and bankrupt banks with significance levels of <5% and <10%, respectively. There were no significant differences in the CAR indicators between the two groups of rural banks analyzed.

➤ *Statistical Test Results*

Before conducting logistic regression testing, it is necessary to ensure that there is no strong correlation between research variables. If there is multicollinearity, it can affect the predicted value of the variable seen in the beta coefficient in the model. In addition, the existence of multicollinearity also makes the confidence interval value wider and the error standard higher.

	Constant	NPL	PPAP	Roa	ROE	Before	CAR
Constant	1.000	-.732	-.607	.211	-.159	-.792	.241
NPL	-.732	1.000	.369	-.242	.348	.332	-.292
PPAP	-.607	.369	1.000	.064	-.012	.421	-.118
ROA	.211	-.242	.064	1.000	-.650	-.080	-.104
ROE	-.159	.348	-.012	-.650	1.000	-.102	.052
NIM	-.792	.332	.421	-.080	-.102	1.000	-.480
CAR	.241	-.292	-.118	-.104	.052	-.480	1.000

Table 5:-Multicollinearity Test. Source: data processing result, 2022

Based on Table 5, there is no multicollinearity problem between research variables. This is explained by the correlation value between variables < 0.8 so that all variables can be used to perform logistic regression. All 66 research samples were all tested as shown in Table 5

Unweighted Cases ^a		N	Percent
Selected Cases	Included in Analysis	66	100.0
	Missing Cases	0	.0
	Total	66	100.0
Unselected Cases		0	.0
Total		66	100.0

Table 6:- Case Processing Summary. Source: data processing result, 2022

Table 7 describes the code of dependent variables in the study. On logistic regression, the value of the variable is binary. rural bank categorized As Healthy has code 0 while rural bank category Bankruptcy is worth 1.

Original Value	Internal Value
Healthy	0
Bankrupt	1

Table 7:- Dependent Encoding Variables. Source: data processing result, 2022

Based on the regression model feasibility test using the Hosmer and Lemeshow Test, the significance value of $0.572 > 0.05$ so that it can be concluded that the model can predict the observation value well

Step	Chi-square	df	Itself.
1	5.724	7	.572

Table 8:- Hosmer and Lemeshow Test. Source: data processing result, 2022

The values are listed in Table 9 describes the number of dependent variables used in the study. It was noted that the number of Healthy rural banks was 33 and the Number of Bankrupt rural banks was 33. The correct percentage value indicates that rural bank with a value code of 0, namely Healthy rural bank, has a percentage of 50% of the total dependent variable data studied

Observed		Predicted		
		BPR		Percentage Correct
		Healthy	Bankrupt	
BPR	Healthy	0	33	.0
	Bankrupt	0	33	100.0
Overall Percentage				50.0

Table 9:- Classification Table. Source: data processing result, 2022

The Nagelkerke R Square and Cox & Snell Square values explain that independent variables can explain 73.1% and 57.9% of rural bank status as dependent variables while the remaining 26.9% and 42.1% are described as other variables.

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
39.000	.549	.731

Table 10:- Coefficients of Determination. Source: data processing result, 2022

Simultaneous testing on logistic regression is seen from the significance value of the Omnibus Test. Table 11 explains that the significance value of $0.00 < 0.05$ so that simultaneously the entire independent variable has a significant effect on the bankruptcy status of rural bank.

Description		Chi-square	df	Itself.
Step 1	Step	52.495	6	.000
	Block	52.495	6	.000
	Model	52.495	6	.000

Table 11:- Simultaneity Test (Omnibus Test of Model Coefficients). Source: data processing result, 2022

The results of the partial test show that there are several indicators that have a significant effect on the bankruptcy of rural banks, namely; NPL, ROA and ROE while PPAP, NIM and CAR have no significant effect. The significance value of the NPL indicator is $0.006 < 0.01$ and has a positive correlation with the bankruptcy status of rural bank so that the higher the NPL level, the potential for rural bank bankruptcy increases. The significance value of ROA is $0.004 < 0.01$ and has a negative correlation with the bankruptcy status of rural banks so that the higher the value of rural bank Return On Assets, the lower the potential for rural bank bankruptcy. The significance value of ROE $0.008 < 0.01$ thus partially affects the bankruptcy status of rural bank. However, a positive correlation indicates that the high value of ROE further increases the potential for rural bank bankruptcy.

Furthermore, there are three indicators that do not have a significant effect on the status of bankruptcy, namely; PPAP with a significance value of $0.365 > 0.05$, NIM with a significance value of $0.892 > 0.05$ and CAR with a significance value of $0.699 > 0.05$. The PPAP and CAR indicators correlate positively to the bankruptcy status of rural banks while NIM has a negative correlation as stated in Table 12.

Indicators	B	S.E.	Forest	df	Itself.	Exp(B)
NPL	.204	.074	7.632	1	.006	1.227
PPAP	.001	.001	.821	1	.365	1.001
Roa	-.258	.088	8.486	1	.004	.773
ROE	.016	.006	7.057	1	.008	1.016
Before	-.011	.080	.019	1	.892	.989
CAR	.005	.012	.149	1	.699	1.005
Constant	-3.547	1.870	3.597	1	.058	.029

Table 12:- Partial Test Results. Source: data processing result, 2022

The amount of influence of an indicator can also be explained through the odds ratio value, namely Exp(B). This value indicates the comparison of the number of expected opportunities with unexpected ones. In the NPL indicator, rural banks that have a 1% higher NPL will have a 1.227 times higher risk of bankruptcy than rural banks that have a 1% lower NPL. Furthermore, rural banks that have a 1% higher PPAP value will have a 1,001 times higher risk of bankruptcy than rural banks that have a 1% lower PPAP.

In the income aspect (earnings), rural banks that have a 1% higher ROA will have a 0.773 times lower risk of bankruptcy than rural banks that have a 1% lower ROA. Then, rural banks that have a 1% higher ROE will have a 1,016 times higher risk of bankruptcy than rural banks that have a 1% lower ROE. Furthermore, rural banks that have a 1% higher NIM will have a 0.989 times lower risk of bankruptcy than rural banks that have a 1% lower NIM. As for the CAR indicator, rural banks that have a 1% higher CAR will have a 1,005 times higher risk of bankruptcy than rural banks that have a 1% lower CAR.

After knowing the value of the constants and calculations on each research variable, the logistic regression equation can be determined as follows:

$$\ln(\text{RURAL BANK}) = -3.547 + 0.204\text{NPL} + 0.001\text{PPAP} - 0.258\text{ROA} + 0.016\text{ROE} - 0.011\text{NIM} + 0.005\text{CAR}$$

C. Discussion

This study analyzes the chances of rural bank bankruptcy in Indonesia through a prediction model using RGEC Indicators as a predictor variable. The results of the independent t-test showed that five of the six predictors, namely NPL, PPAP, ROA, ROE and NIM, had significant average values and were indicators of distinction between rural bank thanks to the Healthy category and rural bank category Bankrupt. The CAR between the two categories of rural banks is not significant as a distinguishing indicator. The highest average difference of the predictor variable is ROE with 34.46% while the lowest average is NIM with 4.64%.

After knowing the distinguishing indicators, the logistic regression analysis tests partially and simultaneously the influence and correlation of such indicators on the chances of rural bank bankruptcy. The test results showed that the variables NPL, ROA and ROE had a significant influence while PPAP, NIM and CAR had no significant effect. Based on these data, it is important to examine indicators that have an effect on their relation to the odds ratio to determine the amount of risk between variables.

Of all the variables that affect the chances of rural bank bankruptcy, the NPL value has the highest risk value. A difference of 1% NPL will change the risk level of bankruptcy by 1.22 times. For example, there are two RURAL BANKS where rural bank A has an NPL ratio of 3% while rural bank B has an NPL ratio of 5%, so if bpr B's NPL ratio increases to 10%, the chances of rural bank B's bankruptcy increase to (1.22 x 5 = 6.1) times higher than rural bank A.

The high value of NPLs means that customers are unable to pay their obligations. Problems with liquidity, rentability and solvency can arise if the rural bank cannot reduce the NPL level. The initial consequence of the high NPL is that rural bank's profit will decrease along with the guidance of reserves according to credit collectability.

The calculation of rural bank profit is also the basis for measuring ROA, namely the ability of productive assets owned by rural bank to generate profit. Logistic regression testing showed that ROA had a negative correlation with the chances of rural bank bankruptcy. Based on the odds ratio, it can be concluded that rural banks that have a 1% higher ROA will have a 0.773 times lower risk of bankruptcy than rural banks that have a 1% lower ROA. The value of ROA can increase if rural bank can manage productive assets effectively and efficiently, for example by reducing the cost of funds, maintaining profit margins by distributing quality credit and reducing non-performing loans.

The third indicator that has an effect is ROE, namely the ability of rural banks to manage equity from shareholders to profits. The results of the logistic regression analysis showed a positive correlation between ROE and the chances of rural bank bankruptcy. There are several indications that cause the high ROE to affect the chances of rural bank bankruptcy, including; excess debt, for example rural bank gets a large amount of loan and then used to buy shares of its company so as to increase EPS but stagnant growth, Some schemes which makes the equity account small when compared to the amount of net profit will reduce the proportion of equity. As a result, the denominator value in the calculation i.e. equity becomes smaller and increases the ROE value. In terms of risk level, rural banks that have a 1% higher ROE will have a 1,016 times higher risk of bankruptcy than rural banks that have a 1% lower ROE. The data emphasizes that the high value of ROE rural bank must be obtained from the high profit, not the reduced equity value. Further research is needed to analyze the influence and correlation between these two variables in order to explain more comprehensively.

The description of the research results and the discussion answer the research hypothesis that tests the NPL indicator. PPAP, ROA, ROE, NIM and CAR against the probability of bpr bankruptcy. The variables NPL (Risk Profile), ROA, ROE (Earnings) have a significant effect while the other variables have no effect.

The results of this study confirm the findings of several studies that show the influence of financial performance indicators on the probability of rural bank, such as in Sufitri (2019) which states that it is significantly NPLs have a positive and significant effect on the prediction of rural bank bankruptcy. Puspitasari et al (2022) argue that high NPLs can reduce the level of profitability of rural banks and if these conditions occur in the long term, it will result in reduced core capital and increase the risk of bankruptcy. However, the findings of Sistiyanini and Supriyono (2017) and Kristianti (2017) state that NPLs do not have a significant effect on bpr bankruptcy because there are other indicators that are more influential.

Furthermore, in the ROA indicator, Budiwati and Jariah (2014) stated that simultaneously the variables ROA, ROE and NIM had a simultaneous effect on bpr bankruptcy while the findings of Sufitri (2019) were in accordance with the results of a study where ROA was negatively correlated and significant effect. In contrast to the findings of Kristianti (2017) who argued that ROA has no significant influence on the bankruptcy of rural banks. He reported that the CAR variable had a significant effect and could better explain this.

Some of the findings that confirm the influence of NIM variables are Budiwati and Jariah (2014), Kristianti (2017) and Sistiyanini and Supriyono (2017). The results of their study stated that the NIM variable had no significant effect on the effect of rural bank bankruptcy. The high NIM does indicate the bank's ability to manage its productive assets but interest income still has the consequence of high interest expense, especially if the rural bank makes interest adjustments .

As for other indicators such as PPAP, previous studies did not make it a measurement indicator in studies except Sufitri (2019) which stated that the variable had a negative effect and reduced probability of bankruptcy and differs from the results of this study.

V. CONCLUSION

Based on the results of previous research and discussion, the author summarizes several conclusions as follows:

- The variables NPL, ROA and ROE are significantly different between Healthy rural bank and Bankrupt rural bank. This is evidenced by the value of the significance level of < 1%. The PPAP and NIM variables each significantly distinguish healthy and bankrupt bpr with significance levels of <5% and <10%, respectively.

There were no significant differences in the CAR variables between the two groups of rural bank analyzed.

- The results of the partial test showed several variables that had a significant effect on the probability of rural bank bankruptcy, namely; NPL, ROA and ROE while PPAP, NIM and CAR have no significant effect. Simultaneously , independent variables have a significant effect on the probability of bpr bankruptcy.
- Of all the variables that affect the chances of rural bank bankruptcy, the NPL value has the highest risk value. A difference of 1% NPL will change the risk level of bankruptcy by 1.22 times. Rural banks that have a 1% higher ROA will have a 0.773 times lower risk of bankruptcy than rural banks that have a 1% lower ROA. Rural banks that have a 1% higher ROE will have a 1,016 times higher risk of bankruptcy than rural banks that have a 1% lower ROE. The regression equation is as follows

$$\ln(\text{RURAL BANK}) = -3.547 + 0.204\text{NPL} + 0.001\text{PPAP} - 0.258\text{ROA} + 0.016\text{ROE} - 0.011\text{NIM} + 0.005\text{CAR}$$

A. Recommendations

- The data samples used in this study only include rural banks located in Java. Therefore, the development of research with the same theme and case studies can be developed by expanding the territory of rural banks.
- The indicators used are limited to the RGEC Model only. Macroeconomic aspects can be considered for inclusion in the measurement model as they relate to interest rates and other indicators that are expected to help predict the probability of bankruptcy of a rural bank.
- The period of rural bank categorized bankruptcy as a reference for research data is a rural bank that was revoked its business license by the Financial Services Authority from 2016-2021. In order to obtain more representative comparison and sampling data, subsequent research can extend the period to ten years.

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