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What are the Determinants Affecting the Financing Risk in Indonesian Sharia Rural Banks?

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Abstract

Rapid and dynamic changes in the financial and economic systems are posing various risks and instabilities to Islamic banking institutions. Therefore, this study aims to investigate the impact of macroeconomic factors and bank abilities on financing risk in Indonesia. In this analysis, the 2005-2019 sharia banking statistics at 92 rural banks were emphasized in the country. A panel data regression was also employed with the fixed effect method during the experimental procedure. The results showed a negative and significant relationship between economic growth, FDR (financing to deposit ratio), and CAR (capital adequacy ratio) toward financing risk. Moreover, a positive and significant relationship was found between the benchmark loan rate on financing risk, although inflation had no significant effect. Economic growth was also a key factor influencing financing risk in the sharia rural banks sector. Based on these results, banking regulators were found to operate according to sharia principles, to selectively optimize and carefully monitor financial distribution and activities with high financing risk.

Keywords: Economic growth, financing risk, inflation, benchmark loan rates, FDR, CAR

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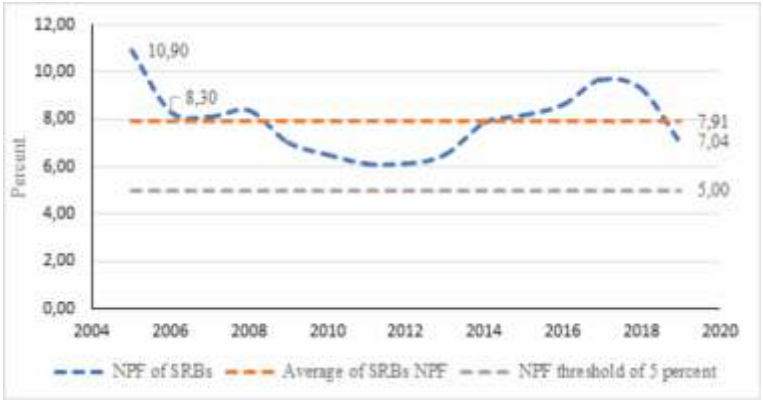
INTRODUCTION

Banking is responsible for playing an important role in the economic progress of a country (Rushchyshyn et al., 2021), with banks being the financial institutions obtaining and distributing funds from the public as savings and other monetary forms to improve welfare (Kasmir, 2015; Ozili, 2018). These institutions consist of conventional and Islamic banks (Kassim & Islam, 2015; Salman & Nawaz, 2018). At conventional banks, the determination of prices is considered by using the concept of interest on the distribution of funds to the public (Mushtaq & Siddiqui, 2017). Meanwhile, Islamic banks provide funds as tangible goods (assets), regardless of the concept of buying and selling, leasing, or profit sharing (Umam, 2013). Furthermore, the development of sharia rural banks (SRBs) shows its function as an intermediary institution between parties with excess and inadequate funds, to synergize the financial and real sectors. In the banking unit, financial mediation is specifically very important for the real sector development in the economy of every country, including Indonesia (Marwa et al., 2022).

Besides the roughness of financial activities channeled to the community, a problem is also observed namely non-performing financing (Mishra et al., 2021). In Islamic banking, financing risk (NPFs) is an indicator showing the quality of disbursed funds and its high value often lead to the occurrence of problematic funding (Chalid & Bella, 2021; Sudarsono & Ash Shiddiqi, 2022). This indicates that the financing quality of sharia commercial banks and businesses is maintained with an average NPFs below the 5% threshold in Indonesia. However, 8 provinces are found to have NPFs values of more than 5% in this country, namely Central Kalimantan (35.10), Bangka Belitung (20.59), DKI Jakarta (17.66), Riau Islands (16.58), Bengkulu (15.80), Banten (13.10), South Sulawesi (10.55), and Riau (9.38) (OJK, 2019b). A total of 16 provinces also experienced improvements in financing quality throughout 2019, according to a decrease in the value of the NPFs ratio. From this context, the gross NPFs ratio was recorded at 2.90% or lower than the previous year which was 2.15%. Meanwhile, the net NPFs was 1.89% in 2019, which was the impact of the loss reserves increment formed by the sharia commercial bank and business unit. Low-quality financing was also calculated based on financing with collectability categories in special mention, substandard, doubtful, and loss (Budiarto, 2021; Shala et al., 2018).

Based on Figure 1, the financing risk of the Indonesian sharia rural banks published by the Financial Services Authority (OJK) was observed, with the average NPFs during 2005-2019 being 7.91%. In this case, the highest, lowest, and medium NPFs were observed in 2005, 2011, and 2019 at 10.90%, 6.11%, and 7.04%. These values indicated that a very high NPF triggered financing risk due to being greater than the standard of the central bank, which is 5%. Besides being observed in sharia rural banks, these activities are also found in conventional financial institutions (Wasiaturrahma et al., 2020). In 2008, the financial crisis influenced by global uncertainty subsequently triggered worldwide economic risk. This caused a significant delay in investment and expansion by business actors, leading to slow GDP growth, and weakened public purchasing power.



Source: (OJK, 2019a)

Figure 1. The financing risk (NPFs) of sharia rural banks, 2005-2019

Macroeconomic fundamental indicators such as economic growth, benchmark loan rates (BIR), and inflation, also serve as a reference for Islamic banking in channelling financing (Amzal, 2016; Hafizh et al., 2020). From this context, economic growth directly affects the development of Islamic banking financing. Based on the Islamic macroeconomic perspective, a negative relationship is often observed between economic growth and the rate of profit. This leads to the development of the investment and saving curve in the Islamic macroeconomic balance graph. Meanwhile, the LAM curve symbolizes the speculation of interest in obtaining liquidity. According to (Rosly, 2005), the rate of obtained profit need to contain three elements based on the perspective of Islamic economics, namely (1) added value because of the element of work, (2) risk taking due to the uncertainty of price changes in the goods traded, and (3) liability in the event of a defect in the goods being traded.

An increase in GDP per capita also affect financing risk, with increased income leading to smaller monetary uncertainty due to the ability of people to pay loans and vice versa (Angraini & Anindita, 2020; Muqorrobin et al., 2021). Meanwhile, rising or falling inflation and benchmark loan rates (BIR) influence risks in the real sector business, leading to an effect on financing. This is because inflation causes a decline in the purchasing power of people

(Avci & Yucel, 2016; Oner, 2012; Rafsanjani, 2019). It is also a reference for the smooth distribution of Islamic banking financing, due to the increment of funding risk by increased inflation. Similarly, an increase in the benchmark loan rate is found to adjust the value of profit sharing in Islamic banking (Ascarya, 2012), as well as determine the margin and ratio. When the benchmark credit interest rate drops, the profit rate for Islamic BPRs then becomes higher, compared to conventional banks. Since the risk of BPR financing is higher, financing limitation is employed to reduce the level of funding risk (Beik & Arsyianti, 2008).

Financing is one of the products in Islamic banking, which is a source of capital distributed to the public. This explains that the high and low financing risk is influenced by both internal and external factors. From this context, various relevant previous studies are observed as references, such as (Muhammad et al., 2020), where the return on assets, capital adequacy ratio, and bank size significantly and negatively affected NPFs. However, financing to deposit ratios and third-party funds did not influence NPFs in SRBs. Nugrohowati and Bimo (2019); also Rahman and Fatmawati (2020) found that total assets, CAR (Capital Adequacy Ratio) and return to possessions, and Operational Efficiency Rato significantly, negatively and relevantly, as well as substantially impacted NPFs, respectively. Meanwhile, the benchmark loan rate and GDP positively and significantly influenced the NPFs of SRBs in Indonesia, with inflation and unemployment being insignificantly effective. In Firmansyah (2014); Muqorrobin et al. (2021), bank size and efficiency, GDP and inflation, as well as liquidity insignificantly, negatively, and positively affected NPFs, respectively. Liquidity did not also mediate the relationship between bank size, efficiency, GDP, and inflation on non-performing loans.

From these reports, several incomplete gaps requiring subsequent analyses are observed. Although many studies had investigated the credit risk of conventional and Islamic commercial banks, as well as business units, only a few emphasized the importance of macroeconomic complexities such as regional economic growth, inflation, and BI rate to financing risk reduction in sharia rural financial institution. The capabilities of banks were also considered, such as FDR (financing to deposit ratio) and CAR (capital adequacy ratio), in maintaining a healthy balance and the financing risk of rural sharia banks. Therefore, this study aims to determine the impact of macroeconomic factor and bank abilities on financing risk in Indonesian sharia rural banks. The results obtained are expected to confirm the development of previous reports, to determine the most consistent outputs. This study is subsequently grouped into various categories, with Sections 1, 2, 3, and 4 emphasizing the introduction, methods, results and discussion, as well as the conclusions and policy implications, respectively.

METHOD

This study was conducted in the Sharia rural banks (SRBs) operating in Indonesia, whose data were obtained from the 2005-2019 banking statistics report on the OJK (Financial

Services Authority), BI (Bank of Indonesia), and BPS (Indonesian statistics) website. Since the IBRs registered with the Financial Services Authority until 2019, a total of 92 sharia rural banks were distributed across 10 provinces. Moreover, the dependent and independent variables considered to influence the study model were selected in the literature related to the measurement of credit risk in the emphasized banking unit.

Table 1. Description of data and source

Notation	Definition of variables	Measurement	Source
NPFs	Financing risk is a ratio that Shows the growth rate of non-performing funding for Islamic banks.	Percent	Financial Services Authority
GRDP	Economic growth is an increase in the production of industrial goods and services from one period to another, as measured by regional GRDP development.	IDR total (constant, 2010)	Indonesian statistics
INF	Inflation is the general and continuous increase in the price of goods and services within a specific regional period.	Percent	Indonesian statistics
BIR	Benchmark loan rate is the reference interest value useful for controlling various economic and financial turmoil, as measured by BI and BI-7-day reverse repo rates.	Percent	Bank of Indonesia
FDR	Financing to deposit ratio is used to measure the composition of the credit amount provided, compared to the values of public funds and capital by the bank.	Ratio	Financial Services Authority
CAR	Capital adequacy ratio is useful for accommodating the risk of loss coated by the bank.	Ratio	Financial Services Authority

To overcome the main experimental problem, the panel data regression method was used to identify the macroeconomic determinants and financial institution abilities on sharia rural banks' financing risk in Indonesia. This method is commonly used to obtain a sample of observations across a cross-section, over a specific period (time). In the panel data, the observation indexed by size were the number of banks (N) multiplied by the size of the time series (T). This led to the minimization of the multicollinearity connection problem, by performing an N x T dimensional analysis, which was unable to be conducted in the horizontal

section and time series assessment only (Baltagi, 2005). For more than one independent variable, the general model of panel data linear regression is presented as follows,

$$y_{i,t} = a_i + \gamma_1 x_{1_{i,t}} + \gamma_n x_n \ldots_{i,t} + \mu_{i,t} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where, a_i = a specific unobserved variable for each individual, γ_1 to γ_5 = the coefficients obtained from each independent variable, y = dependent variable, and $x_1 \ldots x_n$ = Independent variable.

From this expression, the model is assumed to be constant over time for everyone. The following panel data regression models were also assumed, (i) pooled OLS, (ii) fixed effects, and (iii) random effects. These methods were selected through three model suitability tests, namely (1) The Chow test deciding between the pooled OLS and the fixed effect methods (Chow, 1980), (2) The selected Hausman test selecting between random and fixed effect techniques (Hausman, 1978), and (3) The LM test deciding between the pooled OLS and random effect methods (Breusch & Pagan, 1980). Therefore, the development of the econometric model specification applied to answer the study questions is as follows,

$$NPFs_{i,t} = \alpha_0 + \gamma_1 lnGRDP_{i,t} + \gamma_2 INF_{i,t} + \gamma_3 BIR_{i,t} + \gamma_4 FDR_{i,t} + \gamma_5 CAR_{i,t} + \mu_{i,t} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where, $NPFs$ = financing risk measured by percent of SRBs, $GRDP$ = economic growth measured by the logarithm per region, INF = inflation analyzed by percent per region, BIR = benchmark loan rate measured by percent, FDR = financing to deposit tested by ratio, and CAR = capital adequacy measured by ratio. For the model's sub-notation, $'i'$ = a horizontal cross section (Sharia rural banks), $'t'$ = the dimension of time (time series), β_0 = the coefficient of constant variation, γ_1 to γ_5 = the slope coefficient for the independent variable, and $'\mu'$ = the error term. The explanations for the model variables are presented in Table 1.

RESULT AND DISCUSSION

Table 2 shows the descriptive statistical outputs, where a relationship was found between financing risk and all independent variables, namely economic growth, inflation, loan interest rates, FDR, and CAR.

Table 2. Descriptive statistical outputs

Descriptive	NPFs	lnGRDP	INF	BIR	FDR	CAR
Mean	6.640	3.527	6.220	7.350	88.040	19.721
Median	6.460	2.314	4.311	6.531	40.948	8.421
Maximum	24.700	7.982	17.110	12.750	565.200	21.262
Minimum	0.650	1.751	2.213	4.250	10.126	14.092
Std.Dev.	3.872	2.242	3.865	2.040	116.652	2.273
Obs.	1,380	1,380	1,380	1,380	1,380	1,380
NPFs	-					
lnGRDP	0.676	-				
INF	0.615	-0.426	-			
BIR	-0.419	-0.670	0.734	-		
FDR	-0.393	0.308	0.352	-0.456	-	
CAR	-0.634	0.479	0.360	-0.461	0.473	-

Source: Authors computation

Based on Table 2, the benchmark loan interest rate, FDR, and CAR were negatively related to financing risk. Similarly, inflation and benchmark loan interest rates were related to economic growth, accompanied by the relationship between FDR and CAR with benchmark lending rates.

Table 3 showed the unit root tests by Phillips and Perron (1988) and Dickey and Fuller (1979), where the two assessments employed were preferred because the Augmented Dickey Fuller (ADF) analysis conformed to the Dickey Fuller (DF) test. This was to maintain the possibility of serial correlation in the error terms, by adding lagged difference specifications to the regression. For Phillips and Peron (PP), nonparametric statistical methods were used to maintain the possibility of serial correlation in the error terms, without the addition of lagged difference specifications to the regression. In unit root testing, different methods also need to be used during a structural change. Perron (1989) also developed a formal procedure for testing the unit root when a structural break in the time phase, $t = \lambda + 1$ was changed (Enders, 2004). Moreover, the hypothesis used was similar to the measurement used in the ADF test.

Table 3. The panel unit root test

Variables	Unit root test			
	Level $I(0)$		1st difference $I(1)$	
	PP-test	ADF-test	PP-test	ADF-test
Δ(*NPFs*)	-1.782	-1.939	-5.928**	-9.683***
Δ(*lnGRDP*)	-1.837	-2.299	-6.283***	-8.283***
Δ(*INF*)	-1.633	-0.921	-7.983**	-12.183***
Δ(*BIR*)	-1.894	-2.113	-6.204**	-7.283***
Δ(*FDR*)	-0.938	-1.282	-8.283***	-5.833***
Δ(*CAR*)	-0.789	-2.291	-7.292***	-6.283***

Note: ***, **, and * indicates level of significance at 1%, 5% and 10% respectively

Source: Authors computation

In PP testing, the t-statistic was compared with the corresponding critical value calculated by Perron. This indicated the rejection of H_0 when the t-statistic was greater than t-critical, proving the existence of stationary variables. From this context, the PP and ADF tests were capable of solving the problem of excessive null hypothesis rejection and were applied to small sample sizes. Table 3 shows that all variables are Table 4 shows the diagnostic tests on the model before subsequent analysis, indicating that the system had passed the residual non-normality test, at statistical and probability values of 0.824 and 0.528, respectively. This led to the rejection of H_0, where the model was free from residual abnormality. Serial LM tests It was also free from autocorrelation problems and variance error inequality, according to Serial LM and White Heteroscedasticity tests, respectively. $I(1)$.

Based on the selection of the estimation method in the panel data regression technique, the model validity and suitability had a significant chi-square value of 14,844 through the Chow test, indicating the implementation of FEM (fixed effect method). Similarly, the Hausman test produced a significant statistical value of 59,535, proving the selection of the fixed effect method (Table 4). This showed that the estimation of these parameters was assumed through a fixed effect method with the least squares dummy variable (LSDV) estimator (Wooldridge, 2010). Moreover, the joint estimation of the coefficient, (α_i) to the parameter (γ) ,Used the $N-$ dummy variable for each unit cross section. This led to the acquisition of the adjustment determination coefficient (Adj. R^2) of 0.6273, confirming that the proportion of various financing risks was 62.73%. These results emphasized the prediction from economic growth, inflation, benchmark loan rate, as well as financing to deposit and capital adequacy ratios (FDR and CAR). Meanwhile, the significant statistical value of the *F*-test was 18,997, indicating that the independent variables jointly and relevantly affected financing risk.

Table 4. Panel data regression results of fixed effect methods

Dependent variable: NPFs		
Variables	Coefficient	*t*-statistic
C (intercept)	-4.160***	-13.639
	(0.305)	
lnGRDP (economic growth)	-2.113***	-12.503
	(0.169)	
INF (inflation rate)	-0.149	-1.231
	(0.121)	
BIR (benchmark loan rate)	0.537***	4.551
	(0.118)	
FDR (financing to deposit ratio)	-0.509***	-3.770
	(0.135)	
CAR (capital adequacy ratio)	-0.325***	-3.066
	(0.106)	
Summary:		
R^2	0.6621	
Adj. R^2	0.6273	
F-stat (Prob.)	18.997***	
Selected methods:	X^2 test	
Chow test	14.884***	
Hausman test	59.535***	
Diagnostic test	*F*-stat	
Normal test	0.824	
Serial LM-test	3.413	
White test	2.798	

Note: ***, **, and * indicates level of significance at 1%, 5% and 10% respectively

Source: Authors computation

Based on Table 4, the panel data regression using the fixed effect method was emphasized. This indicated that the negative significant intercept value was -4.160, proving the reduction of financing risk by -4.16%, assuming ceteris paribus. The estimation also confirmed a significant negative relationship between economic growth and financing risk at the level of 1%. From this context, a 1% increase in economic growth is expected to reduce financing risk by 2.11%, assuming other factors are ceteris paribus. The high economic growth proved that the welfare of the people was improving, leading to the actualization of consumption, and debt repayment obligations. These results were in line with Badar and Javid (2013); Darmawanti and Suprayogi (2020); Firmansyah (2014); Ghosh (2015); Kuswahariani et al. (2020); Kuzucu and Kuzucu (2019); Muqorrobin et al. (2021); and Prasanna et al. (2014), where GDP negatively and significantly affected NPF. In contrast to Effendi et al. (2017); Firdaus (2016); Munifatussaidah (2020); Nugrohowati and Bimo (2019); also Santosa et al. (2020), GDP positively and significantly impacted NPF. Meanwhile, the study conducted by (Asmara, 2019; Prastowo & Usman, 2021; Yuniarti et al., 2022) found that GDP was ineffective on NPFs.

Based on the results, inflation rate was also negatively related to financing risk, although possessed insignificant effects, according to the prob-value greater than the 5% significance

level. This implied that inflationary pressures did not directly affect financing risk, because the inflation rate is still under control. The government and Indonesian central bank were also committed to controlling inflation rate, which is one of the macroeconomic indicators highly considered for economic development by policy makers. This result was supported by , where inflation insignificantly affected NPFs. In contrast to , it negatively influenced NPFs. Meanwhile, found that inflation positively and significantly impacted NPFs.

From the results, a positive relationship was found between the benchmark loan rate and financing risk, statistically proving a significant effect amid both variables. This indicated that a 1% increase of benchmark loan rate threshold led to improved financing risk by 0.537%, assuming ceteris paribus. In this case, the control carried out by the Indonesian central bank through the loan rate was effective in reducing risk, due to the optimization of the monetary operating framework in strengthening policy effectiveness. It also emphasized the achievement of controlled inflation targets and financing risk reduction in Indonesia. This result was in line with Aryani et al. (2016); Nugrohowati and Bimo (2019); Santosa et al. (2020); and Sugiharto et al. (2019), where the BIR had a positive sign and significantly influenced NPFs. Different outputs were observed from Ahmad et al. (2018); Fauzukhaq et al. (2021), indicating that the BIR had a negative sign and relevantly impacted NPFs. Meanwhile, Angraini and Anindita (2020); Hasanah and Septiarini (2020); Sudarsono (2018) found that the BIR was ineffective on the NPFs.

A negative and significant relationship was subsequently observed between the financing to deposit ratio (FDR) and NPFs. This implied that a 1% increase in the FDR reduced NPFs by 0.509%. From this context, the liquidity capacity of Islamic rural banks in Indonesia was quite good. Moreover, the following possibilities were observed, (1) funding is channelled selectively to avoid financing risks. Although the high FDR increased profit sharing to third party funds, the liquidity capacity was still lower, and (2) the funds owned by the sharia rural banks were not used (idle funds), leading to the inability to obtain revenue. This was because increased third party funds improved the financing risk borne by banks. These results supported Angraini and Anindita (2020); Kadir et al. (2021); Kuswahariani et al. (2020); and Munifatussaidah (2020), where financing to deposit ratio had a negative sign and significantly affected NPFs. However, Asmara (2019); Damanhur et al. (2018); Darmawanti and Suprayogi (2020); Muhammad et al. (2020); Rahman and Fatmawati (2020) found that FDR insignificantly influenced NPFs.

From the results, a negative and significant relationship was observed between the capital adequacy ratio (CAR) and NPFs. This implied that a 1% increase in CAR reduced financing risk in sharia rural banks by 0.325%. CAR is also known as the capital-to-risk

Weighted assets ratio (CRAR), whose increment explains that the ability of Islamic rural banks to accommodate financing risks, protect customers, as well as promote stability and efficiency is good. These were in line with , where the capital adequacy ratio had a negative sign and significantly impacted NPFs. Different outputs were obtained by , confirming that CAR had a positive sign and relevantly influenced NPFs. However, found that the capital adequacy ratio insignificantly affected NPFs.

CONCLUSION

This study examined the effects of macroeconomic factors and bank abilities on the financing risk of sharia rural banks in Indonesia. In this case, the sharia rural bank and Indonesian statistics were used by applying a panel data regression model. Based on the results, economic growth, as well as financing to deposit and capital adequacy ratios were negatively and significantly related to financing risk. This was accompanied by the positive and relevant relationship between the benchmark loan rate and the funding risk. Meanwhile, inflation negatively and insignificantly influenced financing risk at sharia rural banks in Indonesia.

The results showed that economic growth was the main factor strongly affecting financing risk. More specifically, a negative and significant relationship was documented between economic growth and financing risk in sharia rural banks, where increased commercial development reduced funding uncertainty. This implied that the economic capacity of the community was better with increased commercial growth and development. From this context, the public consumption needs for goods or services also increased, leading to the improvement of supply and market equilibrium construction for commodities and money (IS-LM). In this case, banks should optimize their role as financial intermediaries, by adhering to Islamic sharia principles, economic democracy, and prudential principles, as well as analyzing macroeconomic conditions as a benchmark in fund channelling.

Based on the results, inflation insignificantly affected financing risk, implying that Indonesia's hike rate control is relatively good. In the previous decade, inflation had remained relatively under control, specifically from the supply and demand sections. Therefore, inflation should be strengthened, monitored, and controlled by policy makers, specifically in food and energy products. This is because people's purchasing power need to be maintained due to high household consumption in gross domestic product formulation.

Benchmark loan rate was also positively and significantly related to financing risk. This result was supported by several previous studies, indicating that the determination of the loan rate benchmarks was presently changing very rapidly. In this case, the ability of stakeholders

And the community to pay debt obligations became worse (low). This is because the present benchmark loan rate is the BI 7-day (reverse) repo rate, which quickly affects the money market, banking, and real sector. Besides the wellness of this policy, the improvement of the field studies is also necessary in determining the real conditions and improving supervision in the banking sector. This is based on increasing the effectiveness of monetary policy transmission, through its influence on the movement of money market and banking interest rates.

From the results, the financing to deposit ratio was negatively and significantly related to funding risk. In this case, two strong allegations were considered, (1) financing was selectively channelled to consumers/industries, and (2) the funds owned by Islamic banks were not used (idle funds). Therefore, the managers of sharia rural banks need to selectively, efficiently, and effectively optimize financing distribution to customers based on Islamic principles. This emphasizes smooth bank operations, as well as economic growth and national stability supports toward improving people's living standards.

A significant and negative relationship was also found between the capital adequacy ratio and financing risk. This implied that the ability of sharia rural banks was high, especially the capital adequacy ratio. However, each bank should be guided by sharia principles, and carefully monitor the financing activities having high risks or growth.

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