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Examining Bank Health Ratings and Their Impact on Non-Performing Financing in Indonesian Islamic Banks

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ABSTRACT
The relationship between Islamic Commercial Bank health indicators and non-performing financing requires careful examination amid recent economic volatility. Researchers analyzed quarterly financial data from eleven Indonesian Islamic Commercial Banks spanning 2019-2024 using panel data regression through E-views software, employing the RGEC framework with Financing to Deposit Ratio (FDR), Return on Equity (ROE), Operating Expense to Operating Income Ratio (BOPO), and Capital Adequacy Ratio (CAR) as independent variables, while Non-Performing Financing (NPF) served as the dependent variable. Statistical analysis reveals that FDR, ROE, BOPO, and CAR jointly lack predictive power for NPF variations, with the model explaining merely 3.079% of variance (Adjusted R-Square). Individual variable testing identifies FDR as the sole significant predictor, demonstrating an inverse relationship with NPF—higher financing distribution correlates with lower default rates when lending remains selective, whereas ROE, BOPO, and CAR show no meaningful association with non-performing financing levels. These findings challenge conventional assumptions about financial ratio utility in predicting credit quality deterioration, as the model's weak explanatory power suggests internal financial metrics alone offer insufficient understanding of NPF dynamics. Future research should integrate external determinants including macroeconomic indicators, regulatory policy shifts, and institutional risk management practices to develop more robust predictive frameworks for Islamic banking credit risk.

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Financing to Deposit Ratio (FDR); Return on Equity (ROE); Operating Efficiency Ratio (OER); Capital Adequacy Ratio (CAR); Non-Performing Financing (NPF); Islamic Banking.

ABSTRAK
Hubungan antara indikator kesehatan Bank Umum Syariah dan pembiayaan bermasalah memerlukan pengkajian lebih teliti mengingat volatilitas ekonomi belakangan waktu. Peneliti menganalisis data keuangan kuartalan dari sebelas Bank Umum Syariah Indonesia periode 2019-2024 menggunakan regresi data panel melalui perangkat lunak E-views, menerapkan kerangka RGEC dengan Financing to Deposit Ratio (FDR), Return on Equity (ROE), Beban Operasional terhadap Pendapatan Operasional (BOPO), dan Capital Adequacy Ratio (CAR) sebagai variabel independen, sementara Non-Performing Financing (NPF) menjadi variabel dependen. Analisis statistik menunjukkan bahwa FDR, ROE, BOPO, dan CAR secara bersama-sama tidak memiliki daya prediksi terhadap variasi NPF, dengan model hanya menjelaskan 3,079% varians (Adjusted R-Square). Pengujian variabel individual mengidentifikasi FDR sebagai satu-satunya prediktor signifikan, menunjukkan hubungan terbalik dengan NPF—distribusi pembiayaan yang lebih tinggi berkorelasi dengan tingkat default lebih rendah ketika penyaluran kredit tetap selektif, sedangkan ROE, BOPO, dan CAR tidak menunjukkan asosiasi bermakna dengan tingkat pembiayaan bermasalah. Temuan penelitian menantang asumsi konvensional tentang kegunaan rasio keuangan dalam memprediksi penurunan kualitas kredit, karena daya penjelas model yang lemah menunjukkan metrik keuangan internal saja memberikan pemahaman tidak memadai terhadap dinamika NPF. Riset mendatang perlu mengintegrasikan determinan eksternal termasuk indikator makroekonomi, pergeseran kebijakan regulasi, dan praktik manajemen risiko institusional untuk mengembangkan kerangka prediktif yang lebih kokoh bagi risiko kredit perbankan syariah.

KATA KUNCI
Rasio Pembiayaan terhadap Deposito (FDR); Pengembalian atas Ekuitas (ROE); Rasio Efisiensi Operasional (OER); Rasio Kecukupan Modal (CAR); Pembiayaan Bermasalah (NPF); Perbankan Syariah.

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1. Introduction

The Covid-19 pandemic that occurred in 2020 brought significant changes to society. The education sector experienced a transformation in learning systems, shifting from face-to-face to distance or online learning (Chick *et al*., 2020; Crawford *et al*., 2020). Furthermore, Kawohl (2020) revealed that the Covid-19 pandemic affected not only physical health but also mental health of communities. Suicide rates increased due to stress from job losses and limited socialization spaces caused by social restrictions. Indonesia was not alone in experiencing economic recession (Aditia *et al*., 2020; Hanoatubun, 2020); the entire world faced economic shocks that were faster and more severe than the 1998 global financial crisis (Ozdemir *et al*., 2022; Cowley & Schmidt, 2020; Khaliq & Rahmawati, 2020).

The history of global recessions proves that financial and real economic systems are fundamentally procyclical, characterized by mutually reinforcing interactions as the financial accelerator concept. Poor conditions in the economic sector and financial markets cause macroeconomic and financial downturns (G. A Diah Utari *et al*., 2012; Qudsy *et al*., 2020). Negative impacts also affected financial and economic sectors during the Covid-19 pandemic. Social restrictions impacted the tourism sector through declining tourist numbers, aviation services, hospitality, and land and sea transportation (Correa-Martínez *et al*., 2020; Pambudi *et al*., 2020; Uğur & Akbıyık, 2020). Conventional business operators and MSMEs experienced business crises, leading to defaults among those with bank loans and creating non-performing loan problems (Bartik *et al*., 2020; Gregorius Rio & Pitaloka, 2020; Nabilah *et al*., 2021; Pambudi *et al*., 2020). Capital markets experienced panic in stock markets and declining composite stock price indices (Peng *et al*., 2021; Saraswati, 2019). During the first week of the pandemic announcement, global stock markets lost approximately US$6 trillion in wealth. The S&P 500 index lost more than $5 trillion in value during the same week, while the 10 largest S&P 500 companies experienced combined losses exceeding $1.4 trillion (Ozili & Arun, 2020).

Various empirical evidence demonstrates a pro-cyclical relationship between bank lending operations and business cycles (Ascarya *et al*., 2016; Fathoni *et al*., 2023; Ibrahim, 2016; Qudsy *et al*., 2020). Declining economic capacity of society impacts people's ability to fulfill credit payment obligations to banks, subsequently creating non-performing financing problems. If left unaddressed, issues will emerge from debtor inability and uncollectible loans, causing capital shortages for payments. Approaching 2030, the global economy is projected to face various forms of uncertainty triggered by factors such as disruptive technological developments, climate change, geopolitical tensions, and shifts toward renewable energy (World Economic Forum, 2024). These conditions pose systemic risks to global market stability (Lammi, 2024), particularly for developing countries like Indonesia. According to the International Monetary Fund (2023) report, global economic challenges are increasingly complex due to interconnected crises such as pandemics, global inflation surges, and conflicts between the United States and China. Meanwhile, the Organisation for Economic Co-operation and Development (OECD, 2023) emphasizes that global economic resilience is determined by countries' ability to respond quickly through policy innovation, economic sector diversification, and digital transformation acceleration. In Indonesia itself, several domestic risks that could worsen global shock impacts include exchange rate volatility, dependence on commodity exports, and foreign capital flow instability (BPS, 2023). Preparation is needed to face the global recession.

Bank performance and health are strongly determined by non-performing financing. In Islamic banking, besides evaluating bank health, Islamic financing must also be evaluated because financing serves as a crucial indicator for Islamic bank sustainability. Learning from the Covid-19 pandemic when banks experienced substantial non-

performing financing, steps are required to face the 2030 economic recession that will certainly impact Islamic Banks in Indonesia. Therefore, a study is needed to show bank health conditions and whether bank health influences non-performing financing at Islamic Commercial Banks. Based on the description above, further examination is necessary regarding current Islamic Bank health levels and the influence of bank health on musyarakah financing. To understand this, researchers have formulated a study titled "Examining Health Levels and Their Impact on Non-Performing Financing at Islamic Banks in Indonesia." Empirically, the research questions are formulated as: how is Islamic Bank health, and can bank health influence non-performing financing?.

2. Methodology

This research employs a quantitative approach using data information expressed in numerical units, either discrete (whole numbers) or continuous (fractions/intervals) (Wijaya, 2013). Bank health assessment utilizes the RGEC method established by Bank Indonesia through PBI No.13/1/PBI/2011, replacing the previous CAMELS method regulated in PBI NO.06/10/PBI/2004 for Commercial Bank Health Level Assessment. Regulations require banks to conduct self-assessment of Bank Health Levels using the Risk-Based Bank Rating (RBBR) approach, both individually and on a consolidated basis. Health Level Assessment is performed individually and consolidated with assessment factors including Risk Profile, Good Corporate Governance (GCG), Earnings, and Capital (Ikatan Bankir Indonesia, 2016). The health assessment factors are limited to Risk Profile (NPF) as the dependent variable and FDR, ROE, BOPO, and CAR as independent variables. This research uses secondary data, referring to primary data that has been processed and presented by other parties (Werang, 2015). Data were obtained from quarterly financial reports from 2019 to 2024 of all Islamic Commercial Banks (BUS) published on the Financial Services Authority website (Otoritas Jasa Keuangan, 2023), totaling thirteen banks in 2024. Sample selection used total sampling technique considering characteristics that banks were not in transition and were Islamic Commercial Banks whose quarterly financial reports had been published for the 2019-2024 period. Eleven banks were selected, yielding 264 data points. Data analysis employed panel data, combining time series and cross-section data because the data possess combined characteristics consisting of multiple objects across multiple time periods. Parameter estimation in regression analysis with cross-section data was performed using the Ordinary Least Square (OLS) method (Nuryanto & Pambuko, 2018, p. 6). Panel data regression testing was used to determine relationships between independent variables consisting of bank health indicators (FDR, ROA, ROE, BOPO, and CAR) and the dependent variable of Islamic bank non-performing financing.

Table 1. Operational Definition of Variables

Variable	Definition	Scale
NPF (Y)	Credit risk or risk of debtor or other party failure to fulfill obligations to the bank. This ratio is formulated as: $NPF = \frac{Non - Performing\ Financing}{Total\ Financing}\ x\ 100\%$	Percentage
FDR (X_1)	Risk arising from bank inability to meet maturing obligations from funding sources, cash flow, and/or high-quality liquid assets that can be pledged, without disrupting bank activities or financial condition. This ratio is formulated as: $FDR = \frac{Total\ Financing}{Third\ Party\ Fund}\ x\ 100\%$	Percentage

ROE (X_2)	Ratio of bank ability to obtain net profit related to dividend payments. This ratio is formulated as: $ROE = \frac{Profit\ After\ Tax}{Equity}$ x 100%	Percentage
BOPO (X_3)	Ratio of efficiency level and bank capability in conducting operational activities. This ratio is formulated as: $BOPO = \frac{Operating\ Expenses}{Operating\ Income}$ x 100%	Percentage
CAR (X_4)	Bank capital adequacy ratio measured by comparing total capital with risk-weighted assets (RWA). The formula is: $CAR = \frac{Bank\ Capital}{RWA}$ x 100%	Percentage

This research examines the influence of FDR, ROE, BOPO, and CAR on Non-Performing Financing of Islamic Commercial Banks. For easier understanding, refer to the figure below:

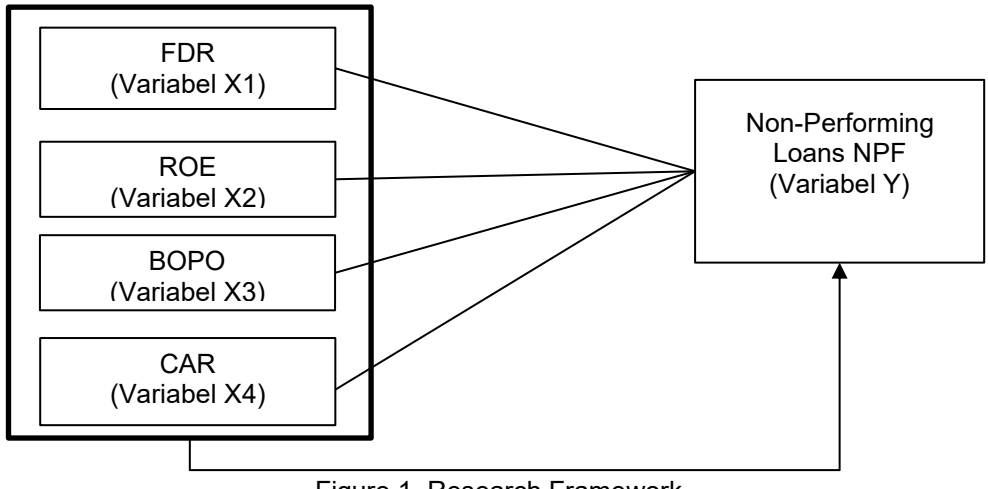

Figure 1. Research Framework

A framework diagram showing FDR (X_1), ROE (X_2), BOPO (X_3), and CAR (X_4) as independent variables pointing toward NPF (Y) as the dependent variable. The general panel data regression model is:

$$LnNPF_{it} = \alpha + \beta_1 FDR_{it} + \beta_2 ROE_{it} + \beta_3 BOPO_{it} + \beta_4 CAR_{it} + e_{it} \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

First Hypothesis:

1) H_0: There is no partial influence of Bank health (FDR, ROE, BOPO, CAR) on Non-Performing Financing (NPF) at Islamic Banks in Indonesia
2) H_1: There is a partial influence of Bank health (FDR, ROE, BOPO, CAR) on Non-Performing Financing (NPF) at Islamic Banks in Indonesia

Second Hypothesis:

1) H_0: There is no simultaneous influence of Bank health (FDR, ROE, BOPO, CAR) on Non-Performing Financing (NPF) at Islamic Banks in Indonesia
2) H_1: There is a simultaneous influence of Bank health (FDR, ROE, BOPO, CAR) on Non-Performing Financing (NPF) at Islamic Banks in Indonesia

The approach developed for estimating panel data models refers to Baltagi (2005). Based on panel data estimation, three approaches exist: Common Effect Model (CEM),

Fixed Effect Model (FEM), and Random Effect Model (REM). To determine the best model for estimating panel data regression, several testing techniques are used: the Chow test to choose between common effect or fixed effect models; the Hausman test to select the best between fixed effect or random effect models in estimating panel data regression; and the Lagrange Multiplier test to choose between common effect or random effect models. After model selection, the next step involves hypothesis testing. Hypothesis testing can be measured by examining F-statistic values, t-statistic values, and coefficient of determination values. The F-test is performed to determine whether independent variables used in the research can explain changes in the dependent variable. In other words, the F-statistic test is used to examine whether the model is appropriate and reliable. Next, the t-statistic value is used to observe the influence of each independent variable on the dependent variable. Finally, the coefficient of determination (R^2) value is examined to assess the extent to which the regression model used can explain the dependent variable.

3. Results

3.1 Model Selection Test Results

Table 2. Chow Test Results

Redundant Fixed Effects Tests Equation: Untitled Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	0.876767	(10,249)	0.5556
Cross-section Chi-square	9.135925	10	0.5193

The obtained Prob value = 0.5193. Based on the criteria, if the prob value F > 0.05, the CEM model is better than the FEM model. Therefore, the selected model is the Common Effect Model (CEM). The analysis then proceeds to the Lagrange Multiplier Test.

Table 3. Lagrange Multiplier Test Results

Lagrange Multiplier Tests for Random Effects Null hypotheses: No effects Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives			
Test Hypothesis	Cross-section	Time	Both
Breusch-Pagan	0.447921	6.811072	7.258993
	(0.5033)	(0.0091)	(0.0071)
Honda	-0.669269	2.609803	1.372165
	(0.7483)	(0.0045)	(0.0850)
King-Wu	-0.669269	2.609803	0.877912
	(0.7483)	(0.0045)	(0.1900)
Standardized Honda	-0.327100	2.979197	-2.678885
	(0.6282)	(0.0014)	(0.9963)
Standardized King-Wu	-0.327100	2.979197	-2.961448
	(0.6282)	(0.0014)	(0.9985)
Gourieroux, *et al*.	--	--	6.811072
			(0.0128)

The obtained Breusch-Pagan Prob value = 0.5033. Based on the criteria, if the prob value F > 0.05, the CEM model is better than the REM model. Therefore, the selected model is the Common Effect Model (CEM) (Widarjono, 2009). Based on the model selection test results, the chosen model is the Common Effect Model (CEM).

3.2 Classical Assumption Test Results

After conducting model selection tests, the next stage involves classical assumption testing. Since the selected model is the Common Effect Model, the tests that must be performed in classical assumption testing are the Multicollinearity Test and Heteroscedasticity Test (Basuki & Parwoto, 2017).

Table 4. Multicollinearity Test Results

	X1FDR	X2ROE	X3BOPO	X4CAR
X1 FDR	1	-0.0955	0.0278	-0.1364
X2 ROE	-0.0955	1	-0.0259	0.0309
X3 BOPO	0.0278	-0.0259	1	-0.9051
X4 CAR	-0.1364	0.0309	-0.9051	1

Based on the multicollinearity test results, correlation values < 0.85 were obtained. Therefore, the data passes the Multicollinearity test.

Table 5. Heteroscedasticity Test Results

Dependent Variable: ABS(RESID)
Method: Panel Least Squares
Date: 07/30/25 Time: 17:09
Sample: 2019Q1 2024Q4
Periods included: 24
Cross-sections included: 11
Total panel (balanced) observations: 264

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9599.648	3115.198	3.081553	0.0023
X1FDR	-4.729832	1.535983	-3.079351	0.0523
X2ROE	-0.002452	0.004403	-0.556896	0.5781
X3BOPO	-89.02460	67.80666	-1.312918	0.1904
X4CAR	-24.39097	37.16298	-0.656324	0.5122

The probability results show > 0.05, therefore the data passes the heteroscedasticity test. Based on the two classical assumption tests above, both the Multicollinearity and Heteroscedasticity test requirements have been fulfilled.

3.3 Hypothesis Test Results

Table 6. Hypothesis Test Results

Dependent Variable: YNPF
Method: Panel Least Squares
Date: 07/30/25 Time: 18:12
Sample: 2019Q1 2024Q4
Periods included: 24
Cross-sections included: 11
Total panel (balanced) observations: 264

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6358.787	3266.063	1.946927	0.0526
X1FDR	-3.133723	1.610369	-1.945966	0.0427
X2ROE	-0.001367	0.004616	-0.296050	0.7674

X3BOPO	-59.39626	71.09044	-0.835503	0.4042
X4CAR	-17.16676	38.96273	-0.440594	0.6599
R-squared	0.018949	Mean dependent var	3.704306	
Adjusted R-squared	0.030798	S.D. dependent var	43.09596	
S.E. of regression	43.01404	Akaike info criterion	10.37969	
Sum squared resid	479203.8	Schwarz criterion	10.44741	
Log likelihood	-1365.119	Hannan-Quinn criter.	10.40690	
F-statistic	1.250664	Durbin-Watson stat	2.127962	
Prob(F-statistic)	0.289974			

From the table above, the Prob (F-statistic) value of 0.289974 > 0.05 indicates that all X variables (FDR, ROE, BOPO, and CAR) simultaneously do not influence the Y variable (NPF). The Adjusted R-Square value of 0.030798 (3.079%) indicates that variation in NPF can be explained by FDR, ROE, BOPO, and CAR by 3.079%, while the remainder is explained by other variables outside the model. It can be observed that the only independent variable with significant influence is X1, namely FDR. Meanwhile, other variables (ROE, BOPO, and CAR) do not influence NPF. FDR has a Prob value of 0.0427 with a coefficient of -3.133723, indicating that FDR has a partial influence on non-performing financing with a negative direction. This means the higher the FDR, the lower the non-performing financing, or vice versa. In contrast, ROE, BOPO, and CAR have Prob (F-statistic) values greater than 0.05. This means that partially, ROE, BOPO, and CAR do not influence non-performing financing.

4. Discussion

The analysis begins by synthesizing the main findings, explicitly connecting them to the initial research questions or objectives. A judicious interpretation of these findings is provided, moving beyond mere description to explore deeper significance and implications for both theory and practice. The results are contextualized within the existing body of knowledge, clearly articulating how the work confirms, challenges, extends, or refines current theoretical understanding in the field. The regression test results indicate that simultaneously (F-test), the variables FDR, ROE, BOPO, and CAR do not significantly influence NPF, meaning that collectively these independent variables do not significantly affect NPF. Meanwhile, the Adjusted R-Square value of only 3.079% shows that the model has very low explanatory power, meaning only a small portion of NPF variation can be explained by the variables FDR, ROE, BOPO, and CAR. The results suggest that other variables outside the model are more dominant in influencing NPF. The findings align with research by Nurhaliza *et al* (2018), which states that financial ratios such as CAR and BOPO are not always primary predictors in explaining NPF fluctuations, and external factors such as risk management quality and macroeconomic conditions are more dominant in several cases. Partially (t-test), only the FDR variable proves to have a significant influence on NPF, with a negative relationship direction. The results indicate that the higher the fund disbursement by banks (through financing) compared to available third-party funds, the lower the tendency for non-performing financing. The findings support the study by Wahyuningtyas & Utami (2021), which states that high FDR demonstrates optimization in fund distribution, reducing NPF risk when banks are able to maintain financing quality.

On the other hand, the variables ROE, BOPO, and CAR do not have a significant partial effect on NPF. The results show that profitability (ROE), operational efficiency (BOPO), and capital adequacy (CAR) do not directly correlate with the level of non-performing financing in the research setting. The findings are consistent with research

by Faizal Fachri & Mahfudz (2021), which concludes that although CAR is valuable as an indicator of banking prudence, its impact on NPF is not always significant if banks have aggressive risk management policies or if external influences are more dominant. It is evident that although several financial ratios are valuable in banking analysis, not all of these ratios directly impact financing quality. Further research is needed that incorporates variables that may also influence non-performing financing.

5. Conclusion

Based on the regression analysis results, it is known that simultaneously the variables FDR, ROE, BOPO, and CAR do not significantly influence NPF, although the probability value shows a very small figure. The results indicate that the model used has limitations in explaining NPF variation, as evidenced by the low Adjusted R-Square value of only 3.079%. There are other factors outside the model that more dominantly affect the level of non-performing financing. Partially, only the FDR variable significantly influences NPF with a negative direction. The findings show that an increase in FDR can reduce NPF, as long as fund distribution is carried out optimally and selectively. Meanwhile, the variables ROE, BOPO, and CAR do not show a significant effect on NPF, meaning these three financial ratios do not play a direct role in increasing or decreasing non-performing financing in the research setting. The findings confirm that not all financial ratios have predictive power over NPF. To obtain a more thorough understanding, further research needs to be conducted by considering external factors such as macroeconomic conditions, financial system stability, and banking risk management strategies.

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