-RESEARCH ARTICLE-

DOES FINANCING DIVERSIFICATION IMPROVE BANK RISK? EVIDENCE FROM INDONESIAN ISLAMIC RURAL BANKS

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─Abstract─

Islamic banks encounter greater loan or financing risks compared to conventional banks due to profit and loss sharing financing (PLS), which is susceptible to asymmetric information and moral hazards. The non-performing financing (NPF) of Islamic rural banks (IRBs) in Indonesia is looked at in this study. It uses bank-specific variables as control variables and looks at what happens when financing portfolios are diversified. We analysed a sample of 100 IBRs from the years 2017 to 2020, utilising quarterly data. We utilised dynamic panel regression with a two-step GMM method in our study. Our research suggests that a high level of financing concentration has a negative impact on non-performing loans. Bank stability has a negative impact on NPF, while bank capital and low-cost efficiency have a positive impact on NPF. Focusing on financing is an effective strategy for decreasing NPF in major investment banks, while diversifying financing is a more prominent strategy for decreasing NPF in small investment banks. In addition, larger IRBs benefit from their efficient management, which helps reduce non-performance fees. Moreover, the cost efficiency of both large and small IRBs contributes to an increase in non-performance fees. This study provides several

recommendations that have practical and policy implications. Initially, IBRs adopt a financing concentration strategy to minimise their NPF. Additionally, there is a need for IRBs to enhance their cost efficiency to mitigate potential financial risks.

Keywords: Non-Performing Financing, Financing Diversification, Bank-Specific Variables, Islamic Rural Banks, Indonesia.

INTRODUCTION

One of the distinctive features of Islamic banking in Indonesia, which sets it apart from other countries, is the presence of Islamic rural banks. In Indonesia, there are two types of banks that operate according to Islamic principles: Islamic commercial banks and Islamic rural banks. Islamic rural banks, similar to Islamic commercial banks, serve as financial intermediaries that facilitate the distribution of funds from those with surplus to those in need. However, Islamic commercial banks provide funding for large and medium firms. On the other hand, Islamic rural banks direct their funds towards small and medium-sized businesses, which make up most firms in Indonesia. Financing activities, such as loans, play a crucial role in banks' profit generation. The management of these financings by Islamic rural banks will have a significant impact on small and medium enterprises and the Indonesian economy (Widarjono, Anto, & Fakhrunnas, 2020a). The Islamic Rural Bank (IRB) plays a crucial role in bolstering the Indonesian economy.

Financing risk is a significant challenge that Islamic banking, including Islamic rural banks (IRBs), grapples with. Financing risk, whether it is in the form of non-performing loans for conventional banks or non-performing financing for Islamic banks, plays a crucial role in maintaining economic stability (Priyadi et al., 2021). The Indonesian government, through the Financial Services Authority (OJK), places significant emphasis on NPF. All banks are required by the Financial Services Authority to maintain a maximum NPF of 5%. Figure 1 displays the financing risk for both rural banks. The IBRs had an average NPF that exceeded the maximum threshold by 9.06%, which was higher than the NPL of conventional rural banks (4.175) that they were competing against.
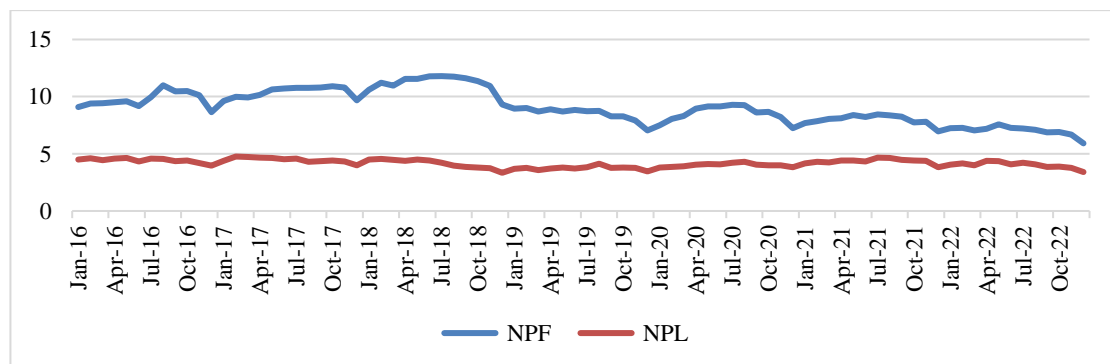

Figure 1: Financing Risk Between CRBs and IRBs, 2016-2022.

Managing NPF has always posed a significant challenge for Islamic bank management (Pratami et al., 2023). Similarly, Islamic banking, including IRBs, also encounters significant challenges in financing due to profit and loss sharing financing (PLS), which is susceptible to issues of asymmetric information and moral hazard (Ibrahim & Alam, 2018; Widarjono, Alam, & Rafik, 2023a). According to Hosen & Fitria (2018), a lack of thorough financing analysis can result in elevated financing risks, which can increase NPF and subsequently lower the company's profitability. Inadequate management of finances is the primary factor contributing to heightened financial risk, often resulting from the negligence of those responsible for handling financial matters. IRB is an Islamic bank that caters to individuals who lack access to traditional banking services. The financing primarily targets the micro business sector. Based on the data from OJK in 2021, Indonesia has a total of 57.89 million business units, with micro, small, and medium enterprises (MSMEs) accounting for 99% of them.

It is crucial to thoroughly examine the factors that contribute to the increase and decrease of the NPF to effectively manage this financial risk. There are various factors that can influence NPF, including both internal and external factors. Internal factors encompass bank capital, financing, and cost efficiency (Priyadi et al., 2021). Interest rates and inflation are examples of external factors (Saputri, Agriyanto, & Abdillah, 2020), and Gross Domestic Product can be found in the works of Retnowati & Jayanto (2020) and Munifatussa'idah (2020). One of the primary concerns for Islamic rural banks as financial intermediaries is the need for diversification in financing and loans, given the significant impairment in funding. There is a continuous discussion surrounding the decision between loan diversification and loan concentration (Tabak, Fazio, & Cajueiro, 2011). According to the traditional banking theory (Berger, Hasan, & Zhou, 2010), banks aim to diversify their financing across different economic sectors to minimise the impact of idiosyncratic shocks on their financing portfolio. Therefore, implementing a diversified financing strategy can effectively mitigate loan risk and improve profitability. In contrast, banks should concentrate on economic sectors to gain a competitive advantage by leveraging their expertise in those sectors and mitigating agency problems, as suggested by the corporate finance theory (Denis, Denis, & Sarin, 1997). As a result, focused funding reduces the risk of loans and enhances profitability.

In addition to diversifying financing across different economic sectors, Islamic banks can also diversify financing by utilising various types of financing contracts. The distinction between Islamic banks and conventional banks lies in their financing contracts, as Islamic banks strictly prohibit the use of interest rates. Islamic bank financing is comprised of two types: Profit and loss sharing (PLS) and non-PLS financing. PLS comprises Mudharabah and Musyarakah, whereas non-PLS includes Murabahah, Salam, Istisna, Ijarah, and Qardh. Prior research has examined the impact of diversifying financing on the performance of Islamic banks. According to the research conducted by Sahul Hamid & Ibrahim (2021) and Šeho, Ibrahim, & Mirakhor

(2021), it has been found that the concentration of financing in specific sectors has a negative impact on profitability in countries that have dual banking systems. In a recent study, Widarjono, Mifrahi, & Perdana (2020b) found evidence that the concentration of sectoral financing has a positive impact on the profitability of Islamic rural banks in Indonesia. In a study conducted by Trinugroho, Risfandy, & Ariefianto (2018), it was discovered that the diversification of financing through financing contracts has a positive impact on the profitability of Islamic rural banks in Indonesia. Research on the influence of diversification financing based on financing contracts on Islamic bank financing risk is currently limited.

The objective of this study is to examine the effects of diversifying financing portfolios, along with control variables, on the level of financing risk faced by Islamic rural banks in Indonesia. Several studies have investigated the impact of loan diversification on the performance of major conventional and Islamic banks. These studies include research by Shim (2019), DANG (2020), Al-kayed & Aliani (2020), Sahul Hamid & Ibrahim (2021), and Šeho et al. (2021). Nevertheless, there is a lack of extensive research on the effects of diversifying financing through financing contacts on the financing risk faced by small Islamic banks, specifically Islamic rural banks. Our empirical study aims to address this gap in the existing literature. We anticipate that this research will yield valuable contributions. Currently, there is a lack of research on the effects of diversifying financing through financing contacts on financing risk within the context of Islamic banks. Second, this study examines the effects of diversifying financing on bank size and determines the most suitable strategy for both large and small banks in managing financing risk.

The paper was structured in the following manner. Section 2 focuses on the literature review and the development of the hypothesis. In the following section, the research methodology will be discussed. In Section 4, the study findings are presented. In conclusion, the final section offers a concise summary and academic recommendations.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Banks primarily collect funds from the public through deposits and then distribute them as credit for conventional banks or financing for Islamic banks. When it comes to financing, banks are required to adhere to the precautionary principle as set forth by the Financial Services Authority. The bank management aims for high-quality financing, but frequently encounters various financing risks that result in a significant amount of non-performing financing. The default rate of financing disbursed is NPF. A larger NPF suggests a lower quality of the financing offered. To maintain profitability, banks should prioritise reducing their NPF. These loans can significantly impact a bank's bottom line, as they eventually translate into costs for the institution. The primary goal of Islamic banks is to facilitate financing in a manner that allows customers to repay all

funds within the agreed timeframe while also sharing in the profits or profit margins. Therefore, the bank does not anticipate the presence of non-performing financing. Nevertheless, it is rare to find banks that experience completely seamless financing. Non-performing financing refers to a situation in which the customer is unable to fulfil their financial obligations to the bank within the specified timeframe.

This study offers a succinct overview of the empirical research on the effects of financing diversification and various bank-specific factors, including bank size, stability, capital, liquidity risk, and cost efficiency, on financing risk. In our study, we have also considered the impact of COVID-19 as an external factor on financing risk.

Financing Diversification and Financing Risk

The topic of loan diversification versus loan concentration is a subject of ongoing discussion in the banking literature. There are two theories that provide explanations for loan diversification: the traditional banking theory and the corporate finance theory. Based on the traditional banking theory, it is recommended that banks diversify their loan portfolios across various economic sectors in order to minimise the risk of default (Berger et al., 2010). A bank that is well-diversified can mitigate the impact of unexpected events on their loan portfolios by distributing the loans across various economic sectors. On the other hand, banks that focus their loans on specific sectors are at risk because they are affected by the volatility of those sectors. The diversification stability hypothesis refers to the concept of loan diversification, which can enhance the profitability of a bank.

Alternatively, a bank should focus on specific economic sectors in accordance with the principles of corporate finance theory. This theory suggests that a bank can enhance its competitive advantage by focusing on specialised lending in specific economic sectors (Denis et al., 1997). Banks can monitor their loans well and reduce agency problems and asymmetric information by specializing in a few economic sectors. Indeed, a bank can detect impaired loans much earlier due to better control to undertake action to mitigate loan risk. Hence, the concentration stability hypothesis states that loan concentration can strengthen bank profitability.

Multiple studies have shown that diversification affects conventional bank performance, supporting classic banking theory. Rossi, Schwaiger, & Winkler (2009) found that loan diversification reduced loan provisions in Austrian commercial banks from 1997 to 2003 using the Granger causality test. Shim (2019) examined US banks from 2002 to Q1 and 2013 to Q3. Static panel regression showed that loan diversification significantly reduces loan risk. Kim, Batten, & Ryu (2020) examined 2002–2012 commercial bank data from OECD countries. Static panel regression showed a link between loan diversity and financial stability. Tabak et al. (2011) revealed that Brazilian bank concentration increased profitability from January 2003 to February

2009 using static panel regression.

Islamic banks offer a variety of contract-based diversification products with their own management and operations. Trinugroho et al. (2018) explored how funding diversification affects Indonesian Islamic rural bank margins. The study used static panel regression from 2012: Q1 to 2015: Q4. The study found that funding diversification boosts margins. Higher margins are used by Islamic rural banks with less loan contract variety and more profit-and-loss sharing. Al-kayed & Aliani (2020) conducted a study on the diversification effect on bank risk and return in the Gulf Cooperation Council (GCC) region. They utilised the panel regression method to analyse data from the period 2010–2018. It is recommended that Islamic banks consider diversifying their instruments when faced with increased risk. However, it is more advantageous for Islamic banks to focus on their own instruments when the risk is low to moderate.

H₁: *Financing diversification has a positive or negative impact on financing risk.*

Bank size and Financing risk

The size of a bank can be determined by examining the assets it possesses. Therefore, the bank's capacity to offer financing increases as its size grows. Large banks can enhance bank management efficiency, thereby minimising financing risks (Ibrahim & Rizvi, 2017). Large banks also grapple with issues of management inefficiency and limited control over financing. The level of funding solely focuses on achieving goals without considering the principle of caution, leading to an escalation in funding risks. The study conducted by Muhammad et al. (2021) revealed an interesting finding - bank size was found to have a detrimental impact on financing risk. Contrarily, Havidz & Setiawan (2015) discovered a favourable correlation between the size of banks and the level of financing risk.

H₂: *Bank size has a positive or negative effect on financing risk.*

Bank Stability and Financing Risk

The Z-score is commonly used as an indicator of bank stability, as highlighted in the studies by Azmi et al. (2019) and Risfandy, Tarazi, & Trinugroho (2022). The Z-score provides an assessment of bank capitalization by considering its profitability and risk. As a result, a bank with a Z-score demonstrates greater bank resilience. A high Z-score indicates effective payment management by bank management, resulting in controlled NPF. As a result, the Z-score negatively impacts NPF.

H₃: *Bank stability negatively affects financing risk.*

Capital and Financing Risk

A crucial aspect of banking, overseen by the government, is the bank's capital, which is assessed through the capital adequacy ratio (CAR). The government enforces regulations on CAR, requiring a minimum of 8% of risk-weighted assets. The significance of this capital lies in its role in preserving bank stability. In the event of a loss, the bank capital serves as a safeguard to mitigate any potential financial setbacks. A strong CAR signifies ample financial resources available to offset any potential losses (Priyadi et al., 2021). The amount of capital possessed demonstrates the bank's capacity to confront potential losses and mitigate financing risks. Thus, a higher CAR corresponds to a lower financing risk (NPF). Studies conducted by Rahman, Asaduzzaman, & Hossin (2017), Sofyan (2019), and Munifatussa'idah (2020) have identified a correlation between CAR and NPF, indicating a negative impact. However, certain studies have indicated that CAR has a beneficial impact on NPF (Nugrohowati, 2019; Priyadi et al., 2021; Saputri et al., 2020).

H₄: *Capital Adequacy Ratio has a positive or negative impact on financing risk.*

Liquidity Risk and Financing Risk

The financing-to-deposit ratio (FDR) is used to assess liquidity risk by comparing the amount of financing to the amount of public funds. The greater the FDR, the more funding that is distributed to the community. Effective management of a high FDR is crucial to ensure a steady income and improved profitability. However, if not handled carefully, it can lead to uncollectible financing, ultimately resulting in an increase in NPF. If the bank charges high fees for financing and has a low approval rate, then an increase in FDR will lead to a higher NPF. The research conducted by Havidz & Setiawan (2015) and Rahman & Fatmawati (2020) revealed a significant correlation between FDR and NPF. Contrasting findings were discovered by Munifatussa'idah (2020) in their study on Islamic banks, and Sofyan (2019) in their examination of conventional banks. They observed a negative correlation between FDR and NPF.

H₅: *Financing to deposit ratio has a positive effect on financing risk.*

Cost Efficiency and Financing Risk

Operational risk is a significant concern for banks as it pertains to the efficiency of their operations, specifically in relation to the ratio of operating costs to operating income (CIR). It is crucial for banks to effectively manage the risk associated with this operation in order to maximise profits. As operations rise, profitability declines. The high NPF explains the high CIR since finance risk might become operational costs. CIR and NPF have a positive association, according to Retnowati & Jayanto

(2020) and Munifatussa'idah (2020). CIR negatively affects financing risk, according to Nugrohowati (2019). Firmansyah (2014) found no CIR effect on the NPF.

H$_6$: *CIR has a positive effect on financing risk.*

COVID and Financing Risk

Our research considers an external event, specifically the COVID-19 outbreak. As a result of the lockdown policy, the COVID-19 pandemic led to a decline in both aggregate supply and demand. As a result, the impact of COVID-19 on domestic production and economic growth has been significant. The economic downturn poses a significant financing risk as it becomes challenging for bank clients to repay their loans (Alabbad & Schertler, 2022). It is anticipated that there is a positive correlation between COVID-19 and financing risk.

H$_7$: *COVID positively influences financing risk.*

RESEARCH METHODOLOGY

Data and Sample

There are currently 165 Islamic rural banks in Indonesia, according to the latest data from OJK in 2021. Our study chose 100 IRBs as a sample using a purposive sampling method, which involved selecting based on specific characteristics or criteria to address research problems. The time frame for the study spans from 2017 to 2020, with data collected on a quarterly basis. The final data set consists of 1600 observations. To conduct a more in-depth analysis, the samples were categorised into two groups: large and small IRBs. If the total assets fell below IDR 50 billion, they were categorised as small IRBs. If the total assets surpassed IDR 50 billion, they were classified as large IRBs. We currently have 44 large IRBs and 56 small IRBs. For this study, the data used consists of financial statements from Islamic rural banks in Indonesia, specifically secondary data. The financial data is sourced from the financial data of IRB, which can be accessed from the website of the Indonesian Financial Services Authority (OJK).

Empirical Method

We use dynamic panel regression to examine the factors influencing the risk associated with Islamic financing, building upon prior research conducted by Alandejani & Asutay (2017), Alam, Hamid, & Tan (2019), Ibrahim et al. (2019), and Mateev, Moudud-Ul-Huq, & Sahyouni (2022). There are two fundamental reasons for selecting the dynamic panel regression. Financing risk in Islamic banks remains consistent over time, indicating that past financing risk directly impacts the current financing risk (Alandejani

& Asutay, 2017; Mateev et al., 2022). Second, endogeneity is a common issue that can arise when modelling regression equations. To address this problem, dynamic panel regression can be a useful approach (Khattak et al., 2022; Louhichi, Louati, & Boujelbene, 2020). The factors influencing NPF can be represented in the following dynamic panel regression equation:

$$NPF_{it} = \theta_0 + \theta_1 NPF_{it-1} + \theta_2 Findiv_{it} + \theta_3 Lasset_{it} + \theta_4 Zscore_{it} + \theta_5 CAR_{it} + \theta_6 FDR_{it} + \theta_7 CIR_{it} + \theta_8 COVID_{it} + e_{it} \quad (1)$$

Where NPL represents non-performing loans, Findiv refers to financing diversification, Lasset represents the natural logarithm of assets, Zscore indicates bank stability, CAR stands for capital adequacy ratio, FDR represents financing to deposit ratio, CIR refers to cost income ratio, and COVID refers to the COVID-19 outbreak.

Measuring financing risk involves looking at non-performing financing (NPF). The calculation of NPF involves dividing non-performing financing by total financing (Alandejani & Asutay, 2017; Ibrahim et al., 2019). Measuring financing diversification involves the use of the Herfindahl-Hirschman Index (HHI) (Trinugroho et al., 2018) as

$$Findiv = \left(\frac{Musyarakah}{TFin}\right)^2 + \left(\frac{Mudharabah}{TFin}\right)^2 + \left(\frac{Murabahah}{TFin}\right)^2 + \left(\frac{Istisna}{TFin}\right)^2 + \left(\frac{Tijarah}{TFin}\right)^2 + \left(\frac{Qard}{TFin}\right)^2 \quad (2)$$

where Tfin is total financing.

The size of a bank is determined by calculating the natural logarithm of its total assets. The Z-score, which measures bank stability, is determined by applying the following formula (Risfandy et al., 2022; Widarjono, Wijayanti, & Suharto, 2022).

$$Z - Score = \frac{(ROA + {EC}/{TA})}{\sigma(ROA)} \quad (3)$$

ROA is the return on asset, EC/TA is the ratio of equity to total assets, and σ(ROA) is the standard deviation of ROA. Z-score relates a bank's capitalization level to its profitability and risk. Thus, the higher the Z-score indicates, the higher the level of bank resilience (Čihák & Hesse, 2010; Ibrahim et al., 2019).

The capital adequacy ratio (CAR) reflects the bank's capital (Mateev & Bachvarov, 2021). The CAR is calculated by considering the ratio of equity to asset-weighted risk (Sutrisno & Widarjono, 2022) in their recent publication (2022). The measurement of liquidity risk is done through the financing deposit ratio (FDR). FDR represents the total financing divided by third-party funds. Cost efficiency can be evaluated by examining the ratio of operating costs to operating income (CIR) (Widarjono et al., 2023b). Here are the measurements and hypotheses presented in Table 1.

Table 1: Variables, Measurement, and Hypothesis.

Variable	Measurement and source	Hypothesis
NPF	Non-performing financing/Total financing (Alandejani & Asutay, 2017; Ibrahim et al., 2019)	
Findiv	Herfindahl-Hirschman Index (HHI) of financing (Trinugroho et al., 2018)	+/-
Asset	Natural logarithm of total Assets (Ibrahim & Rizvi, 2017)	+/-
Z-score	ROA plus CAR divided by the standard deviation of ROA (Čihák & Hesse, 2010; Ibrahim et al., 2019)	-
CAR	Equity/Assets weighted risk (Sutrisno & Widarjono, 2022)	+/-
FDR	Total financing/Third party fund (Sutrisno & Widarjono, 2018)	+
CIR	Operating expense/operating income (Widarjono et al., 2023a).	+
COVID	COVID-19 outbreak	+

Estimation Method

We employ the General Method of Moment (GMM) to estimate the dynamic panel regression. The GMM method is effective in addressing endogeneity issues, as demonstrated by equations (1). Two GMM methods are commonly used to estimate the dynamic panel regression. One method was proposed by Arellano & Bond (1991), while the other was developed by Arellano & Bover (1995). Nevertheless, our study employs the GMM method as it has been shown to produce more reliable estimators compared to alternative GMM approaches (Blundell & Bond, 1998). When it comes to the two-step GMM method, certain tests need to be conducted. First, the test of instrument validity is conducted using the Hansen test. Additionally, the Arellano-Bond test is used to assess the presence of autocorrelation.

RESULTS AND DISCUSSION

Descriptive Statistics

In Table 2, we present descriptive statistics from the collected research data to provide an overview of the findings. The average NPF was 10.28%. The results show that the IRB's NPF is higher than the Indonesian Financial Service Authority's 5% minimum requirement. The Findiv, which represents the average financing diversification, was calculated to be 80.34%. This indicates a

significant level of financing concentration. The average assets of the Islamic rural banks were IDR 87 billion, with a significant level of variation indicating differences among the banks. The average Z-score was 24.77, suggesting that Islamic rural banks are financially stable. The CAR ranges from 2% to 165%, with an average of 26.18%. This indicates that the CAR surpassed the minimum requirement of 8%. Nevertheless, certain Institutional Review Boards experience inefficiency in their capital because of elevated CAR. The FDR exhibits a range of values, with a minimum of 36.5%, a maximum of 351.00%, and an average of 104.68%. These figures indicate that the FDR remains significantly above government regulations, which typically fall within the range of 80% to 90%. The CIR exhibits a range of values, from a minimum of 39.2% to a maximum of 186.35%, with an average of 83.86%. This indicates the presence of both highly efficient banks and those with lower efficiency levels, leading to significant losses for IRBs. In general, the average CIR is high, which suggests that cost efficiency is relatively low.

Table 2: Summary Statistics.

Variable	Mean	Std. Dev.	Min	Max
NPF	0.1028	0.0899	0.0000	0.7556
Findiv	0.8034	0.1745	0.3957	1.0000
Asset	87.0060	156.3681	2.1396	1,402.0510
Zscore	24.7756	26.6168	-2.0132	283.0044
CAR	0.2621	0.1879	0.0020	1.6500
FDR	1.0477	3.0444	0.0074	93.5100
CIR	0.8419	0.3957	0.0207	7.8635
COVID	0.1875	0.3904	0.0000	1.0000

Table 3 displays the correlation matrix of the independent variables. There is a strong correlation of 0.5290 between Z-score and CAR. In general, the correlation between independent variables is typically below 0.5, indicating that our data is devoid of any multicollinearity issues. Our estimators are robust, as expected.

Table 3: Correlation Matrix.

	NPF	Findiv	Lasset	Zscore	CAR	FDR	CIR
NPF	1						
Findiv	-0.0288	1					
Lasset	-0.1952	-0.1256	1				
Zscore	-0.1709	-0.1318	0.1898	1			
CAR	-0.0002	-0.0031	-0.1361	0.5290	1		
FDR	0.0099	0.0228	-0.0125	-0.0104	0.0154	1	
CIR	0.3492	0.0602	-0.1697	-0.1490	-0.0368	-0.0155	1
COVID	-0.0959	-0.0636	0.0860	0.0658	0.1206	-0.0222	0.1386

Baseline Regression

Table 4 displays the findings of the dynamic panel data regression using a two-step GMM approach. Model 1 represents a scenario unaffected by the COVID-19 outbreak, while Model 2 considers the impact of COVID-19. Prior to delving into the findings, it is essential to assess the credibility of the estimation technique. First, the quantity of instruments is lower than the quantity of banks. Second, our findings provide evidence against the Hansen test. The results of those two tests confirm the validity of our instruments. Third, our model is free from autocorrelation problems as we did not reject the AR (2) test. Additionally, the NPF (-1) lag is found to be positively and significantly related to financing risks, suggesting that these risks persist over time. As a result, dynamic panel regression is deemed more suitable than static panel regression.

Table 4: All Islamic Rural Banks.

Variable	Model 1: without Covid	Model 2: with Covid
NPF (-1)	0.4449***	0.4388***
	(0.0323)	(0.0289)
Findiv	-0.0250**	-0.0267**
	(0.0139)	(0.0148)
Lasset	-0.0028	-0.0024
	(0.0029)	(0.0030)
Zscore	-0.0002***	-0.0002**
	(0.0001)	(0.0001)
CAR	0.0257*	0.0280*
	(0.0165)	(0.0173)
FDR	0.0101	0.0109
	(0.0124)	(0.0100)
CIR	0.0251***	0.0309***
	(0.0099)	(0.0109)
COVID	-	-0.0116***
	-	(0.0031)
Constant	0.0687**	0.0624*
	(0.0304	(0.0323)
No. Obs	1600	1600
No. Bank	100	100
No. Inst	22	23
Diagnostic test		
AR (1) test	0.001	0.001
AR (2) test	0.784	0.808
Hansen test	0.253	0.212

Note: Standard errors are presented in parentheses. ***, **, and * denote statistically significant at α=1%, α=5%, and α=10%, respectively

Our study focuses on financing diversification (Findiv) as the primary independent variable. The negative and significant Findiv values at α=5% across all specifications indicate that higher financing concentration leads to a reduction in non-performing loans (NPF). The findings of our study align with the principles of corporate finance theory. Concentrating financing in certain contracts can reduce the risk associated with financing for rural banks adhering to Islamic principles. Islamic rural banks prioritise specific financing contracts that are expected to result in low NPF for two important reasons. Islamic rural banks, being new players in the banking industry, prioritise specific financing contracts to establish their core competency and mitigate high financing risk (Risfandy et al., 2020). Furthermore, in order to comply with regulations on responsible financing, Islamic rural banks are required to focus on specific financing contracts (Beck, Demirgüç-Kunt, & Merrouche, 2013; Widarjono et al., 2020a).

Bank stability (Z-score) is negative and significant at α=1% for model 1 and α=5% for model 2, respectively. Therefore, it can be inferred that the stability of banks hurts non-performing loans. Islamic rural banks are often considered resilient banks with higher Z-scores, primarily due to their strong profitability as measured by return on assets (ROA). ROA metric measures a bank's ability to generate profits by efficiently utilising its assets. A higher ROA signifies better financial management by the bank. Several studies (Muhammad et al., 2021; Rahman et al., 2017; Rahman & Fatmawati, 2020) have observed a correlation between higher profitability and lower financing risk in banks with greater stability.

The bank's capital adequacy ratio (CAR) is found to be statistically significant at α = 1% for all specifications. This indicates that CAR has a positive impact on NPF. The results suggest that there is room for improvement in capital management, as increasing capital may help address non-performing financing. Effective and efficient capital management is crucial for bank management to maximise financing and enhance profitability. Our findings are consistent with research by Rahman et al. (2017) and Nugrohowati (2019), which concluded that bank capital has a favorable effect on NPF. These findings do not concur with the research by Muhammad et al. (2021) and Munifatussa'idah (2020), which suggested a negative correlation between CAR and NPF.

Cost efficiency (CIR) is positive and significant at α=1% for all models. A higher CIR indicates a potential inefficiency in the bank's operations, which could result in an increase in NPF. The CIR holds great significance for Islamic rural banks as it directly affects their profitability. Therefore, it is crucial for bank management to effectively manage operational costs. Improving efficiency is of great importance, given the higher prices of Islamic banking products compared to conventional banks in Indonesia (Widarjono & Rafik, 2023; Widarjono et al., 2023b). The findings align with the studies conducted by Koju, Koju, & Wang (2018), Nugrohowati (2019), and Rahman & Fatmawati (2020). In contrast, these findings are in opposition to the research conducted

by Retnowati & Jayanto (2020) and Munifatussa'idah (2020), which identified a negative correlation between CIR and NPF.

The results for model 2 indicate that COVID-19 has a significant impact, which goes against our initial hypothesis. These findings indicate that COVID-19 has indeed decreased financing risk. There are two factors. Initially, the Indonesian government allocated IDR 600 trillion to address the challenges posed by COVID-19, which included the restructuring of bank financing payments, including those of Islamic banks. Additionally, the impact of COVID-19 has led to a decrease in funding from Islamic rural banks, resulting in a decrease in non-performing loans.

Large vs Small Islamic Rural Banks

The size of a bank has a clear impact on the level of financing risk for Islamic banks, as indicated by previous research (Čihák & Hesse, 2010; Ibrahim & Rizvi, 2017). For a more in-depth analysis, our study categorises Islamic rural banks into two groups based on their assets: large banks and small banks. Table 5 displays the findings for rural banks with an Islamic focus that operate on a larger scale. Our study does not reject the Hansen test, and the number of instruments does not exceed the number of banks, indicating the validity of our instruments. The results we obtained are also devoid of any serial correlation, as indicated by the AR (-2) test. Ultimately, the NPF (-1) demonstrates a positive and significant impact, indicating that the dynamic panel regression holds more weight compared to the static panel regression. This is due to the fact that financing risk remains constant over time for large IRBs.

In our study, we found that financing diversification (Findiv) is a crucial independent variable. It has a negative and significant impact on all models at α=5%. This implies that higher financing concentration leads to a decrease in NPF. The results of our study support the hypothesis regarding the stability of concentration in large Islamic rural banks. They can take advantage of the provided financing contracts and potentially minimise financing risk by concentrating their financing activities on specific contracts. By prioritising financing contracts, they can establish a strong competitive edge, enabling them to effectively manage their financing and reduce the occurrence of non-performing financing.

The asset shows a significant negative impact in models 1 and 2, with a significance level of α=5%. Our findings indicate that the presence of assets has a significant impact on reducing non-performing loans for large Islamic rural banks. Large banks excel in streamlining financing management by leveraging their superior facilities and infrastructure. They possess the necessary resources to effectively monitor financing, from customer selection to tracking customer payments. Consequently, major banks can mitigate financing risks. This finding is consistent with the research conducted by Muhammad et al. (2021), which indicates that assets have a detrimental impact on NPF.

FDR's impact on NPF was significant, as it showed a correlation between increased bank financing and higher NPF. The findings show that IRBs' management of the financing they offer is lacking. If financing is not carefully managed, it can lead to issues with financing. Bank management should prioritise making sound financing decisions rather than solely focusing on meeting targets through high disbursements. The findings align with previous studies conducted by Suryanto (2015), Firmansyah (2014), and Rahman et al. (2017), which demonstrated a strong and meaningful correlation between FDR and NPF. The impact of CIR on financing risk is positive, while the COVID-19 pandemic has resulted in a decrease in financing risk.

Table 5: Large Islamic Rural Banks.

Variable	Model 1: without Covid	Model 2: with covid
NPF (-1)	0.5522*** (0.0206)	0.5222*** (0.0144)
Findiv	-0.0325** (0.0160)	-0.0363** (0.0168)
Lasset	-0.0061** (0.0030)	-0.0052** (0.0031)
Zscore	0.0001 (0.0001)	-0.0001 (0.0001)
CAR	-0.0227 (0.0233)	0.0172 (0.0268)
FDR	0.0582*** (0.0119)	0.0334*** (0.0133)
CIR	0.0108 (0.0103)	0.0194** (0.0114)
COVID	-	-0.0099*** (0.0029)
Constant	0.0689* (0.0349)	0.0780** (0.0352)
No. Obs	704	704
No. Bank	44	44
No. Inst	22	23
Diagnostic test		
AR (1) test	0.004	0.004
AR (2) test	0.248	0.333
Hansen test	0.219	0.216

Note: Standard errors are presented in parentheses. ***, **, and * denote statistically significant at α=1%, α=5%, and α=10%, respectively

Table 6 presents the findings for small Islamic rural banks. Our instruments are reliable as we do not disregard the Hansen test, and the number of banks surpasses the number of instruments. Our findings do not show any serial correlation based on the AR (-2) test. Finally, the NPF (-1) shows a positive and significant relationship, indicating that NPF remains consistent over time for small IRBs. This suggests that the dynamic panel regression is a more suitable approach compared to the static panel regression.

The main independent variable, financing diversification (Findiv), shows a positive and significant impact in model 1. This implies that a decrease in financing concentration leads to a reduction in NPF. The results of our study support the diversification stability

hypothesis for small Islamic rural banks. Based on the traditional banking theory, it is recommended for banks to spread out their financing portfolios among various financing contracts to minimise the risk of default (Berger et al., 2010). A well-diversified bank can mitigate the impact of unexpected events on their financing portfolios by distributing their financings across various contracts.

The CIR exhibits a strong and statistically significant relationship across all specifications, indicating that improved cost efficiency leads to an increase in NPF. Given that the NPF has the potential to incur operating costs, the high NPF can explain the high CIR. Nevertheless, the impact of COVID-19 on NPF is more pronounced for smaller Islamic rural banks compared to their larger counterparts. The impact of COVID-19 on financing risk is statistically significant at $\alpha = 1\%$, indicating a decrease in risk associated with the outbreak. However, the impact of COVID-19 on financing risk is more noticeable for small Islamic rural banks compared to their larger counterparts.

Table 6: Small Islamic Rural Banks.

Variable	Model 1: without Covid	Model 2: with Covid
NPF (-1)	0.4040*** (0.0367)	0.3855*** (0.0339)
Findiv	0.0214* (0.0144)	0.0170 (0.0157)
Lasset	-0.0024 (0.0057)	0.0007 (0.0062)
Zscore	-0.0001 (0.0001)	-0.0001 (0.0001)
CAR	-0.0057 (0.0177)	0.0006 (0.0191)
FDR	0.0119 (0.0099)	0.0100 (0.0081)
CIR	0.0383*** (0.0073)	0.0407*** (0.0081)
COVID	-	-0.0134*** (0.0048)
Constant	0.0290 (0.0580)	0.0043 (0.0620)
No. Obs	896	896
No. Bank	56	56
No. Inst	22	23
Diagnostic test		
AR (1)	0.005	0.001
AR (2)	0.847	0.71
Hansen	0.188	0.201

Note: Standard errors are presented in parentheses. ***, **, and * denote statistically significant at α=1%, α=5%, and α=10%, respectively

CONCLUSION AND RECOMMENDATION

IRBs in Indonesia face significant financial risk due to a high rate of non-performing financing, exceeding the maximum allowed NPF of 5%. Thus, this study aims to

identify the factors contributing to elevated NPF levels. Our research primarily centres around bank internal factors, as they are under the control of management. Our findings indicate that when there is a high concentration of financing, it has a negative impact on the NPF. Enhancing bank stability can help mitigate financing risk, while factors such as bank capital and low-cost efficiency may contribute to an increase in financing risk. What's particularly intriguing is that COVID-19 mitigates the risk associated with financing. However, when banks are categorised based on their assets, this study reveals that concentrating financing is an effective strategy for reducing financing risk for large Islamic rural banks, while diversifying financing is a suitable approach for mitigating financing risk for small Islamic rural banks. Furthermore, larger IRBs experience improved management efficiency, resulting in reduced financial risk. Efficiency at a lower cost can pose financing risks for both large and small IRBs.

The results of this study can be utilised to develop several policy suggestions for practical and policy applications. One of the primary concerns for Islamic rural banks in addressing the issue of reducing NPF is the careful selection of an effective financing strategy. Based on banking literature, banks have the option to pursue either financing diversification or financing concentration. The choice between financing diversification or financing concentration is contingent upon the size of the bank. Large IRBs should consider focusing their financing efforts, while small IRBs should consider spreading their financing across different options. Second, as recommended by Dasgupta (2001) and Odonkor (2018), it is advisable for IRB managers to enforce rigorous credit management or financing management policies. They should also evaluate collateral and customer repayment history when providing financing. Thirdly, when it comes to providing financing, it is crucial to consider the precautionary principle. This is because management often carries out financing analysis without enough caution as they focus on meeting financing targets. This can lead to potential losses. Fourth, policymakers need to develop risk mitigation policies regarding high NPF levels, as they can significantly increase the likelihood of bank failures (Muhammad et al., 2021).

There are certain limitations in this study as it solely focused on testing internal variables that impact financing risk. It is expected that additional research can explore additional factors that may impact NPF, such as macroeconomic variables or internal variables that were not considered in this study.

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