

The effect of liquidity risk on Sharia rural banks' profitability: The role of size and ownership

Sri Rahmany¹ , Agus Widarjono² , Noraziah Che Arshad³ , & Zul Hendri¹ 

¹Program Studi Ekonomi Syariah (S1), Institut Syariah Negeri Junjungan Bengkalis, Kab. Bengkalis, Indonesia

²Program Studi Ilmu Ekonomi (S2), Universitas Islam Indonesia, Kab. Sleman, Indonesia

³Islamic Business School, Universiti Utara Malaysia, Kedah, Malaysia

ABSTRACT

Introduction

Liquidity risk arises from its inability to meet its obligations or to fund an increase in assets at maturity without incurring unacceptable costs or losses. Accordingly, it is essential to gain a deeper understanding of the underlying relationship between bank liquidity and bank performance.

Objectives

The goal of this study is to investigate the impact of liquidity risk on the profitability of Shariah Rural Banks (SRBs), controlling for market competition, bank-specific variables, and macroeconomic conditions.

Method

The study analyzed 154 SRBs from 2015 to 2023 using quarterly data. The total number of observations is 5,496 with unbalanced panel data. This study employs panel regression to investigate the impact of liquidity risk on profitability.

Results

The liquidity risk decreases profitability. Small SRBs encounter more risks related to liquidity risk than large Islamic banks. The local state-owned SRBs are more effective in mitigating the negative impact of funding risk on profitability. Also, strong market power and bank fundamentals support profitability. Furthermore, a good economic condition boosts profitability.

Implications

First, policymakers must oversee the liquidity risk management of SRBs to ensure that the negative impact of mismatched maturity on

JEL Classification:

G21, G28, L25, O16, P43, Z12

KAUJIE Classification:

L27, L41, L43, L53, N13

ARTICLE HISTORY:

Submitted: November 11, 2025

Revised: February 14, 2026

Accepted: February 21, 2026

Published: February 23, 2026

KEYWORDS:

bank ownership; liquidity risk; market competition; profitability; Sharia rural banks; size; sustainable banking

COPYRIGHT © 2026 Sri Rahmany, Agus Widarjono, Noraziah Che Arshad, & Zul Hendri. Licensee Universitas Islam Indonesia, Kab. Sleman, Indonesia.

Contact: Sri Rahmany ✉ srirahmanyahra@gmail.com

This is an open-access article distributed under the terms of the Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0) License (<https://creativecommons.org/licenses/by-sa/4.0/>).

PUBLISHER'S NOTE: Universitas Islam Indonesia remains neutral regarding jurisdictional claims in published maps and institutional affiliations.



profits is relatively small. Second, SRB must effectively manage liquidity risk by carefully selecting customers and closely monitoring financing when they are at high liquidity risk.

Originality/Novelty

The empirical research on the impact of liquidity risk on SRB's profitability is still rare to date. Our research explores the effect of liquidity risk on profitability, considering bank size and bank ownership as moderating variables.

CITATION: Rahmany, S., Widarjono, A., Che Arshad, N., & Hendri, Z. (2026). The effect of liquidity risk on Sharia rural banks' profitability: The role of size and ownership. *Journal of Islamic Economics Lariba*, 12(1), 731-750. <https://doi.org/10.20885/jielariba.vol12.iss1.art26>

INTRODUCTION

The Indonesian economy is dominated by micro, small, and medium enterprises (MSMEs), which account for 99% of all businesses in Indonesia. According to the Central Bureau of Statistics (BPS), the contribution of MSMEs to Indonesia's GDP is substantial, at around 42%. One of the primary obstacles for MSMEs is a lack of capital. Therefore, the role of small-scale banking is vital in supporting the development of MSMEs. Hence, the contribution of MSMEs to the economy depends on the performance of microfinance institutions, one of which is Sharia rural banks (SRBs). However, on the other hand, Sharia rural banks as financial intermediary institutions must carefully distribute their funds. The global banking crisis of 2007–2008 was rooted in the carelessness of banks in allocating their funds and the inadequate level of bank capital, including the absence of a capital buffer.

Following the 2007–2008 world financial crisis, the rapidly growing literature has investigated various important elements of Basel III, including bank regulations for higher capital requirements and bank risk-taking. However, the study is limited to investigating the impact of funding liquidity on bank risk-taking after the implementation of Basel III (Abbas et al., 2021; Addou et al., 2024; Birindelli et al., 2022; Rokhim & Min, 2020). In response to these issues, the Basel III Accord introduced new liquidity requirements, specifically for banks that are considered important and internationally active. To this end, the Basel III Accord encourages in-depth reforms to banks' current risk management practices in both supervisory and regulatory frameworks to address bank liquidity risks (Al-Sari, 2025; Dahir et al., 2018). Responding to the ongoing discussions, regulators have acknowledged the significance of appropriate funding liquidity and capital. To do this, they initiated regulations that force banks to maintain sufficient funding and capital. This rule is built on the conviction that higher liquidity increases the bank's capacity to withstand external shocks and avoid the possibility of forthcoming financial crises (Al-Sari, 2025; Dahir et al., 2019; Miklian & Hoelscher, 2022).

Liquidity risk (LR) is the risk that arises from the inability of a bank to meet its obligations at maturity without experiencing intolerable losses. This risk may negatively

affect the income and capital. Consequently, the banks must ensure the availability of sufficient funds to fulfil the future demands of customers at an acceptable cost. There are two main dimensions of liquidity risk. First, liquidating assets is a timely need. Second, liquidating assets is for a reasonable market value (Adwan et al., 2020; Arif & Anees, 2012; Oktaviana & Titis Miranti, 2025).

Some studies investigated the relationship between LR and bank performance across different countries, yielding mixed findings. Several studies show that LR has a negative effect on the performance of banks, both conventional and Islamic banks (Abbas et al., 2021; Mogaji & Nguyen, 2022; Smaoui et al., 2020; Wang & Zhuang, 2022). By contrast, previous empirical studies have shown that liquidity risk has a positive impact on bank profitability. Rudhani & Balaj (2019) and Prenaj et al. (2023) explored the relationship between LR and bank performance in Kosovo. Their results documented a positive relationship between LR and bank performance. Also, they indicated that the performance of commercial banks can be improved by strengthening their capability to address liquidity risks, as indicated by other studies (Bilal et al., 2024; Eltweri et al., 2024).

Some empirical studies analyzed the performance of SRBs in Indonesia. However, research on SRBs' performance is still focused on the influence of bank fundamental variables such as market strength, stability, size, capital, efficiency, and financing. Some studies analyzed bank-specific factors in profit (Hidayah & Karimah, 2023; Sudarsono et al., 2021; Trinugroho et al., 2018; Widarjono et al., 2020; Widarjono & Anto, 2020). Several studies have analyzed bank-specific factors related to financing defaults (Khan, 2024; Priyadi et al., 2021). Some research also investigated bank-specific factors on efficiency (Wasiaturrahma et al., 2020).

Several studies investigated the relationship between funding liquidity risk (FLR) and SRBs' performance. Widarjono et al. (2022) showed that FLR raises the risk of SRBs in the pre-COVID period. Putri & Widarjono (2023) and X. Li et al. (2021) showed that funding risk increases profitability. Jusuf & Widarjono (2024), Ghenimi et al. (2020) and Gunawan & Soma (2025) documented that funding liquidity risk reduces the profits of Sharia rural banks. However, funding liquidity risk is different from liquidity risk. Funding liquidity risk is a risk associated with the bank's inability to access funding sources, such as deposits.

The purpose of this study is to analyze the influence of liquidity risk (LR) on the profitability of SRBs in Indonesia. The empirical studies of the impact of liquidity risk on SRB's profitability are still rare to date. We expect to contribute not only the theoretical but also the practical aspects. First, this study contributes to the Islamic banking literature because there are still limited studies on the impact of LR on the SRBs' profitability. Second, this study includes bank size and bank ownership as moderating variables in affecting the effect of LR on profitability. Third, from a practical perspective, this research is expected to yield important insights for the effective governance of SRBs, particularly in managing liquidity risk, which supports the Indonesian economy.



LITERATURE REVIEW

Liquidity risk is a sudden obligation that forces banks to sell their assets quickly at prices lower than fair market prices. Then, banks may experience a liquidity shortage when customers immediately cash in their deposits (Acharya & Naqvi, 2012; Berrospide, 2021; Fungacova et al., 2021; Mustafa, 2020). Liquidity shortages are relevant to the health of banks. In times of turmoil, high liquidity lowers stability, but it does not affect stability in normal times.

Debtor defaults and depositor withdrawals are crucial aspects of the nexus between liquidity and credit risk, as outlined in the financial intermediation theory. Depositors fear when short-term liabilities are combined with long-term assets. In addition, a bank encounters liquidity risk through its asset transformation process, as it holds hard-to-liquidate assets on its balance sheets while still offering liquidity to debtors and fulfilling liquidity claims of depositors. Hence, illiquid credit and liabilities can be associated with greater liquidity creation, which can lead to increased credit risk (Abdelaziz et al., 2022; Hsieh & Lee, 2020; Sunarsih et al., 2022).

Several studies have analyzed the impact of liquidity risk on profitability. Megeid (2017) and Abdo et al. (2022) found, in the case of banking in Egypt, that conventional banking is better at managing liquidity risk. Several factors influence liquidity risk management in conventional banking. Loan quality, funding, and asset quality management have a positive effect on liquidity risk management. However, for Islamic banking, loan quality and funding management have a positive effect on liquidity, while asset quality has an adverse effect on it.

Hassan et al. (2019) and Hoque & Liu (2023) examined the relationship between liquidity risk, credit risk, and bank stability for both conventional banks (CBs) and Islamic banks (IBs) within the Organization of Islamic Cooperation. There is a negative relationship between liquidity and credit risk during the financial crisis period for IB, but a negative relationship between liquidity and credit risk during the post-financial crisis period, not only in IB, but also in CB. Additionally, liquidity risk also undermines the stability of both conventional banks and Islamic banks.

Mustafa (2020) analyzed the liquidity risk to banking profits in Sudan. The results found that the risk of liquidity shortage (LSR) in the form of Current Deposit to Total Deposit (CD/TD), Total Financing to Total Deposit (TF/TD), and Inflation (INF) ratios have a negative relationship with their financial performance as measured by Return on Assets (ROA).

Sunarsih et al. (2022) examined the effect of LR and NPF on the stability of Islamic banking in Indonesia during the COVID-19 pandemic. The results showed that liquidity and credit risk lower stability. However, the impact of liquidity risk on bank stability remains unaffected by the COVID-19 pandemic.

Rahmadany et al. (2024) investigated the effect of LR on credit risk in the case of conventional banks and Sharia banks in Indonesia during COVID-19. The findings indicate that the effect of LR on credit risk is inverted U-shaped. It increased non-performing loans (NPL) as it is lower than the threshold, but as it exceeded the threshold,

it began to decrease NPL. Additionally, the effect of liquidity risk on NPL is lower in conventional banks compared to Sharia banks.

Several studies have examined the effect of FLR on the performance of SRBs in Indonesia. [Widarjono et al. \(2022\)](#) examined the effect of FLR on stability. FLR has a negative effect on the stability of SRBs. Large SRBs face a higher risk than small SRBs, but small SRBs encounter a higher probability of financing defaults than large SRBs. The effect of FLR on risk is smaller for SRBs in off Java than in Java. [Putri & Widarjono \(2023\)](#) found that funding liquidity risk has a positive effect on SRBs' profits for SRBs located in Java. However, large SRBs face lower risks related to the effect of FLR on profitability than small SRBs. [Jusuf & Widarjono \(2024\)](#) found that funding liquidity risk reduces SRBs' profits in Sumatra. Another finding is that large SRBs face lower risks when compared to the effect of funding liquidity risk on profits than small SRBs

METHOD

Data

This study analyzes all Shariah Rural Banks in Indonesia. There are as many as 154 SRBs. The research period spans nine years, from 2015 to 2023, utilizing quarterly data. The number of observations is 5496 with unbalanced panel data. The data of this study were taken from the balance sheet report, profit and loss statement, and financial ratio report of each SRB reported to the OJK. All data can be retrieved through the OJK website ([Otoritas Jasa Keuangan, 2024](#)).

Empirical model

This study uses panel regression to explore the influence of LR on SRBs' profitability ([Smaoui et al., 2020a](#)). The panel regression is written as follows:

$$\text{Profit}_{it} = \phi_0 + \phi_1 \text{LR}_{it} + \phi_2 \text{Lerner}_{it} + \phi_3 \text{Lasset}_{it} + \phi_4 \text{CAR}_{it} + \phi_5 \text{CIR}_{it} + \phi_6 \text{NPF}_{it} + \phi_7 \text{GDRP}_{it} + \phi_8 \text{COVID}_{it} + e_{it} \quad (1)$$

where profit is Profitability, LR is liquidity risk, assets are total assets, CAR is capital adequacy ratio, CIR is a cost-income ratio, NPF is non-performing financing, and COVID is COVID-19.

The dependent variable in this study is profit. Profit is measured by Return on Asset (ROA) and Return on Equity (ROE) ([Ardana & Nurmalia, 2025](#); [Widarjono & Anto, 2020](#)). The main independent variable in this study is liquidity risk (LR). Liquidity risk is a situation where banks are unable to meet obligations from customers quickly within a certain period ([Smaoui et al., 2020](#); [Wang & Zhuang, 2022](#)). Liquidity risk is measured by total financing divided by liquid assets. Liquid assets consist of Wadiah Savings, Savings, and Deposits ([Hussain & Rasheed, 2022](#)). Several studies show that liquidity risk has a negative effect on the performance of banks, both conventional and Islamic banks ([Abbas et al., 2021](#); [Mogaji & Nguyen, 2022](#); [Smaoui et al., 2020](#); [Wang & Zhuang, 2022](#); [Widarjono et al., 2022](#)).

This study also includes several bank-specific variables as control variables that affect the profits of Islamic banks. The market variable is competition. The Lerner Index

measures market competition (Y. Li & Peng, 2024). The following formula measures the Lerner index:

$$\text{Lerner} = \frac{(\text{Price} - \text{Marginal Cost})}{(\text{Price})} \quad (2)$$

The ratio of total income to assets measures price (Widarjono et al., 2023). Marginal cost is derived from the translog cost function with two inputs (Lestari et al., 2026; Pamikatsih & Purwanto, 2025). The translog cost function is as follows:

$$\text{LTC}_{it} = \theta_0 + \sum_{m=1}^2 \theta_1 \text{LV}_{m,it} + 0.5 \sum_{m=1}^2 \sum_{n=1}^2 \rho_{mn} \text{LV}_{m,it} \text{LV}_{n,it} + \sigma_1 \text{LTA}_{it} + 0.5 \sigma_2 (\text{LTA}_{it})^2 + \sum_{m=1}^2 \sigma_{2m} \text{LTA}_{it} \text{LV}_{m,it} + \epsilon_{it} \quad (3)$$

Total cost (TC) refers to total fees for depositors and operating expenses. TA is the total assets. V1 is the ratio of the fee for depositors to total deposits. V2 is the ratio of operational costs to fixed assets. MC is calculated by taking partial derivatives of the total assets from equation (3) as follows:

$$\text{MC}_{it} = (\sigma_1 + \sigma_2 \text{LTA}_{it} + \sum_{k=1}^2 \sigma_{2k} \text{LV}_{k,it}) \frac{\text{TC}_{it}}{\text{LTA}_{it}} \quad (4)$$

The bank-specific variable comprises size, capital, efficiency, and financing risk. Assets measure the size of the bank (Putri & Misbah, 2025; Siddique et al., 2021). CAR represents bank capital (Dias, 2021; Pratami et al., 2025). CIR measures the efficiency of bank operations. NPF indicates financing risk (Ahmad et al., 2020; Lestari et al., 2026; Neves et al., 2020; Sutrisno & Widarjono, 2024). This study also included macroeconomic variables, encompassing Gross Regional Domestic Product (GRDP) and COVID-19. COVID-19 has led to a decline in Indonesia's economic growth, thus raising liquidity risks. Table 1 shows the definitions, measurements, and hypotheses.

Table 1

Variable Definitions and Hypotheses

Variable	Definition	Hypothesis
Dependent variable		
ROA	Earnings after tax divided by total assets	
ROE	Earnings after tax divided by total equity	
Independent variables		
LR	Total financing divided by Wadiah Savings, Savings, and Deposits	-
Lerner index	(Price - marginal cost)/price	+
Asset	Total assets	-/+
CAR	Equity divided by Assets weighted risk	+
CIR	Ratio of cost to income	-
NPF	Ratio of financing defaults to financing	-
GRDP	Gross Regional Domestic Product	+
COVID	Covid-19 pandemic	-

Source: Authors' analysis.

For further analysis, this study considers the effect of bank size. Bank size affects the performance of Islamic banks (Hendri et al., 2025; Ibrahim & Rizvi, 2017). Some studies

suggest that the impact of funding liquidity risk varies between large SRBs and small SRBs. The negative impact of FLR on risk is higher for small SRBs than for large SRBs (Widarjono et al., 2022). Also, the negative impact of FLR on profitability is higher for small SRBs than for small SRBs (Jusuf & Widarjono, 2024). Therefore, our research splits SRBs comprising small and large SRBs (Putri & Widarjono, 2023). This study explores bank size as a moderating variable on the relationship between LR and profitability. We employ the following regression model:

$$\text{Profit}_{it} = \emptyset_0 + \emptyset_1 \text{LR}_{it} + \emptyset_2 \text{LR}_{it} * \text{large} + \emptyset_3 \text{Lerner}_{it} + \emptyset_4 \text{Lasset}_{it} + \emptyset_5 \text{CAR}_{it} + \emptyset_6 \text{CIR}_{it} + \emptyset_7 \text{NPF}_{it} + \emptyset_8 \text{GDRP}_{it} + \emptyset_9 \text{COVID}_{it} + e_{it} \quad (5)$$

Furthermore, based on ownership, Shariah rural banks (SRBs) are divided into two categories, encompassing those owned by local governments and those privately owned. SRBs owned by local governments serve both social and commercial purposes and are typically in the form of regionally owned business entities. In addition, government-owned SRBs receive financial support from the local government and non-financial support, such as human resource training and integration of regional economic programs (Sudarsono et al., 2024). This study aims to determine whether ownership affects the magnitude of liquidity risk's impact on profits. To examine the impact of bank ownership as a moderating variable, this study uses the following regression model:

$$\text{Profit}_{it} = \emptyset_0 + \emptyset_1 \text{LR}_{it} + \emptyset_2 \text{LR}_{it} * \text{Owner} + \emptyset_3 \text{Lerner}_{it} + \emptyset_4 \text{Lasset}_{it} + \emptyset_5 \text{CAR}_{it} + \emptyset_6 \text{CIR}_{it} + \emptyset_7 \text{NPF}_{it} + \emptyset_8 \text{GDRP}_{it} + \emptyset_9 \text{COVID}_{it} + e_{it} \quad (6)$$

This study uses static panel data regression. There are three estimation methods used to estimate the regression of static panel data, namely the common effect (CE), fixed effect (FE), and random effect (RE) methods. From these three estimation methods, the most appropriate method to estimate the static panel regression in this research case is selected. There are three tests used to select the proper estimation method. First, the F test is chosen to pick between the CE and FE. Second, the Bruesch-Pagan (BP) test is selected to determine whether to use the CE and RE. lastly, the Hausman test is chosen to select between FE and RE (Rita & Sugiarti, 2025; Spada et al., 2024).

RESULTS AND DISCUSSION

Statistics Summary

ROA can be used to measure profitability in a bank because Bank Indonesia, as a banking supervisor, prioritizes the value of a bank's profitability. The profitability ratio is a ratio to assess the company's ability to generate profits in a certain period. The greater the ROA in the bank, the greater the profit obtained by the bank and the better the bank will use its banking assets (Saif-Alyousfi, 2020). Based on research conducted by Imbierowicz & Rauch (2014) and Hung et al. (2020), the liquidity risk variable is the

difference between all the liabilities that could be retreated in a very short time, which can be translated into cash promptly to cover unexpected losses at a low cost.

Table 2 reveals the summary statistics. The mean of ROA was 1.47% with a standard deviation of 12.26%. OJK sets the minimum ROA of 1.5% for Islamic banks that are categorized as strong health. The average ROE was 19.1% with a standard deviation of 43.53%. The mean of liquidity risk is 164.40% with a standard deviation of 4.37. The liquidity risk of SRBs is quite high because it is above 100%, which means that SRB carries out financing activities quite expansively because it exceeds their capacity.

Table 2

Descriptive Statistics

Variable	Mean	Std. dev.	Min	Max
ROA	0.0121	0.1035	-1.5734	4.6766
ROE	16.0641	38.0432	-300.1400	577.3500
LR	1.6501	3.7052	0.0000	112.2017
Asset	84.4643	151.1867	0.9546	1911.0000
Lerner	0.4115	1.1645	-16.8034	23.2649
CAR	0.1835	0.2071	0.0178	6.1038
NPF	9.7240	10.1159	0.0000	104.0900
GRDP	96.4727	76.1686	2.4611	262.3430
COVID	0.1961	0.3971	0.0000	1.0000

Source: Primary data. Authors' estimation.

Correlations between independent variables affect the validity of regression coefficients. Table 3 shows the correlation between the independent variables. Correlation between the independent variables is less than 0.5, indicating no multicollinearity problems and producing a robust estimator.

Table 3

Correlation Matrix

	ROA	ROE	LR	Asset	Lerner	CAR	NPF	GRDP
ROA	1							
ROE	0.5435	1						
LR	-0.0301	-0.0410	1					
Asset	0.0329	0.1813	-0.0125	1				
Lerner	0.1637	0.0679	0.0461	-0.0679	1			
CAR	-0.1509	-0.2208	0.1064	-0.2109	0.1821	1		
NPF	-0.1542	-0.2330	-0.0370	-0.1251	0.0192	0.2824	1	
GRDP	0.0360	0.0913	0.0571	0.1562	0.0214	-0.0493	-0.0140	1
COVID	-0.0194	-0.0612	0.0742	0.0407	-0.0092	-0.0354	-0.0865	0.0143

Source: Primary data. Authors' estimation.

Baseline Regression

Now, we start with the effect of liquidity risk on profitability. The static panel regression is widely estimated using three methods, comprising common effect (CE), fixed effect

(FE), and random effect (RE). Table 4 presents the results. Some tests at the bottom part of Table 4 are employed to select the best method. The results of the diagnostic test revealed that the fixed effect method was the best for estimating our panel data based on the F-test, LM test, and the Hausman test.

Table 4 shows that the liquidity risk is negative and significant at $\alpha=1\%$, meaning that the liquidity risk has a negative effect on profitability. An increase in liquidity risk decreases ROA and ROE by 0.45% and 59.68%, respectively. Assets are negative and statistically insignificant on ROA, but they positively affect ROE, meaning that assets increase ROE. Lerner is positive and significant on ROA and ROE, implying that low competition increases profitability. CAR is negative and statistically significant for both ROA and ROE, indicating that higher capital results in lower profitability. The NPF is negative and statistically significant for ROA and ROE, indicating that low operating inefficiency negatively impacts profitability. GRDP is positive and significant, implying that GRDP positively affects profit. COVID-19 is negative and significant, so COVID has a negative effect on profits.

Table 4

Baseline Regression

Variable	ROA		ROE	
	Fixed effect	Random Effect	Fixed effect	Random Effect
LR	-0.0045*** (0.0000)	-0.0024*** (0.0000)	-0.5968*** (0.0000)	-0.5750*** (0.0000)
Lasset	-0.0054 (0.1940)	0.0016 (0.3670)	5.3251*** (0.0000)	6.6760*** (0.0000)
Lerner	0.0231*** (0.0000)	0.0200*** (0.0000)	5.0500*** (0.0000)	4.8659*** (0.0000)
CAR	-0.1134*** (0.0000)	-0.0817*** (0.0000)	-9.0387** (0.0130)	-10.0481*** (0.0030)
NPF	-0.0015*** (0.0000)	-0.0013*** (0.0000)	-0.4766*** (0.0000)	-0.4981*** (0.0000)
LGRDP	0.0364** (0.0430)	0.0017 (0.3210)	7.8436*** (0.2000)	2.2581** (0.0290)
COVID	-0.0068** (0.0430)	-0.0077** (0.0200)	-8.2681*** (0.0000)	-8.5208*** (0.0000)
Constant	-0.2822* (0.0900)	-0.0103 (0.7710)	-161.9350*** (0.0040)	-120.0729 (0.0000)
R-squared	0.1040	0.0391	0.0603	0.3490
Obs.	5496	5496	5496	5496
Bank.	154	154	154	154
F test	4.34***		8.05***	
LM test	408.66***		2441.66***	
Hausman test	226.24***		18.61***	

Source: Primary data. Authors' estimation. Notes: The probabilities are reported in brackets. *, **, *** indicate statistically significant at $\alpha=10\%$, $\alpha=5\%$, $\alpha=1\%$. This study does not provide a common method (CE) for conserving space.



The first discussion begins with liquidity risk. Liquidity risk negatively impacts profitability. The findings of the study show that liquidity risk increases the risk of bank bankruptcy and decreases profitability. SRB has more impetus to take risky projects due to the higher liquidity risk and clearly supports the theory of bank lending (Acharya & Naqvi, 2012). Hassan et al. (2019) and Mikou et al. (2024) argued that Islamic banks encounter high liquidity risks. Customers permit them to invest their funds to achieve high profitability. Due to the limitations of prospective investments, they struggle to generate high profits and, therefore, face a high liquidity risk. Second, they also have restricted entrance to the money market, making it difficult for them to increase funds during liquidity shortages. Accordingly, they must keep high liquid assets to fulfil the high demand for liquidity. This study is in line with some previous studies (Abbas et al., 2021; Mogaji & Nguyen, 2022; Wang & Zhuang, 2022; Widarjono & Anto, 2020).

Several independent variables are also significant. Assets positively affect profits, meaning that large SRBs will discourage profits. The reason is that the operating area of SRBs is only located at the district level. Large SRBs cause inefficiencies in bank operations, thus reducing profits. This finding supports the “too big to fail” hypothesis and is in accordance with a previous study (Hendri et al., 2025; Wastuti et al., 2025).

The Lerner index has a positive effect on SRB's profits. This finding indicates that low market competition due to the high market power of SRBs causes high bank profits. SRBs can capitalize on their market power to increase margins so that income is high, and then profit is high as well. This finding confirms the previous empirical studies, including Trinugroho et al. (2018).

CAR has an adverse effect on profitability, meaning that CAR decreases SRBs' profits. The low CAR ratio is due to an increase in the expansion of risky assets that are not supported by additional capital, so that banks lose the opportunity to invest, which can reduce public trust in banks and affect profitability (Jusuf & Widarjono, 2024; Madugu et al., 2020). However, this does not support previous studies such as Putri & Widarjono (2023).

NPF has an adverse effect on profits. This finding shows that high NPF indicates that customers are unable to meet their obligations on time. SRBs must then provide a loss reserve for financing taken from operating profits. As a result, high NPF will reduce SRBs' profits. Our result supports the existing empirical research (Sutrisno & Widarjono, 2024).

GRDP has a positive effect on profits. This result indicates that high economic growth causes SRB's profits to increase. High economic growth has two important implications for SRBs. First, high economic growth encourages banks to raise more funds and increase profits. Second, high economic growth also causes customers' ability to pay their loans on time, so it does not cause an increase in NPF. This finding is in line with previous research, such as Ledhem & Mekidiche (2020), Abasimel (2023), and Hendri et al. (2025).

COVID-19 is significantly negative, suggesting that it has reduced the profitability. The effect of COVID-19 was evident in the second quarter of 2020 as economic growth experienced negative growth in that quarter and the subsequent third and fourth quarters. During periods of negative economic growth, banks are unable to distribute

funds, and customers have difficulty repaying their loans, thereby reducing SRBs' profits. These findings support previous research that COVID lowered SRBs' profits (Jusuf & Widarjono, 2024).

Bank Size Effect

Next, this study examines bank size as a moderating variable on the link between LR and profitability. The results are presented in Table 5. According to the F-test, LM test, and the Hausman test at the bottom of Table 5, the best method is the Fixed Effect (FE) model. Table 5 shows that liquidity risk is negative and significant for both ROA and ROE, consistent with the previous findings. The interaction term (LR*size) is positive and statistically significant for both ROA and ROE, meaning that size will reduce the negative impact of FR on profitability. Assets are statistically insignificant on ROA, but they positively affect ROE. Lerner is positive and significant on profitability. CAR is negative and statistically significant on profitability. NPF is negative and significant on profitability. GDRP is positive and significant on profitability. COVID-19 is negative and significant on profitability.

Our discussion focuses on the interaction between funding risk and bank size (LR*size). This coefficient is significantly positive. These findings imply that large SRBs are more pronounced in reducing the negative impact of funding risk on profitability. A reasonable reason is that they have better facilities and infrastructure to handle any problem associated with liquidity risk. As a result, large SRBs face lower liquidity risk and higher profitability than small SRBs (Smaoui et al., 2020).

Table 5

Moderating Effect of Bank Size

Variable	ROA		ROE	
	Fixed Effect	Random Effect	Fixed Effect	Random Effect
LR	-0.0080*** (0.0000)	-0.0034*** (0.0000)	-0.9318*** (0.0000)	-0.8752*** (0.0000)
LR*size	0.0073*** (0.0000)	0.0030*** (0.0000)	0.7139** (0.0110)	0.6431)** (0.0170)
Lasset	-0.0056 (0.1780)	0.0007 (0.6950)	5.3095*** (0.0000)	6.5577*** (0.0000)
Lerner	0.0222*** (0.0000)	0.0192*** (0.0000)	4.9655*** (0.0000)	4.7983*** (0.0000)
CAR	-0.1097*** (0.0000)	-0.0767*** (0.0000)	-8.6760** (0.0180)	-9.7550*** (0.0030)
NPF	-0.0016*** (0.0000)	-0.0013*** (0.0000)	-0.4874*** (0.0000)	-0.5073*** (0.0000)
LGRDP	0.0380** (0.0340)	0.0015 (0.3220)	7.9990 (0.1910)	2.2359** (0.0300)
COVID	-0.0069** (0.0370)	-0.0076** (0.0220)	-8.2811*** (0.0000)	-8.4972*** (0.0000)
Constant	-0.2974* (0.0720)	0.0067 (0.8400)	-163.4158*** (0.0040)	-117.7036*** (0.0000)

Variable	ROA		ROE	
	Fixed Effect	Random Effect	Fixed Effect	Random Effect
R-squared	0.1172	0.1090	0.0615	0.3427
Obs.	5,496	5,496	5,496	5,496
Bank	154	154	154	154
F test	4.90***		8.10***	
LM test	449.24***		2456.02***	
Hausman test	427.91***		22.73***	

Source: Primary data. Authors' estimation. Notes: The probabilities are reported in brackets. *, **, *** indicate statistically significant at $\alpha=10\%$, $\alpha=5\%$, $\alpha=1\%$. This study does not provide a common method (CE) for conserving space.

Bank Ownership Effect

Our research also examines the moderating effect of bank owners to investigate the impact of bank owners on liquidity risk and its effect on profitability. The findings are shown in Table 6. The best method is the Fixed Effect (FE) model based on the F-test, LM test, and the Hausman test at the bottom of Table 6. The results indicate that liquidity risk negatively affects both ROA and ROE, confirming previous findings. The interaction term (lir*owner) is positive and statistically significant for both ROA and ROE, indicating that the government-owned SRBs will lower the negative impact of FR on profitability. Assets are statistically insignificant on ROA, but they positively affect ROE. Lerner positively influences profitability. CAR is negative and statistically significant on profitability. NFP negatively affects profitability. GRDP positively affects profitability. COVID-19 is negative and significant on profitability

Our discussion emphasizes the interaction between funding risk and bank owner (LR*Owner). This coefficient is positive and statistically significant in relation to profitability. These results suggest that local government-owned SRBs are more effective in mitigating the negative impact of funding risk on profitability (Sudarsono et al., 2024). There are several reasons for this finding. First, state-owned banks can receive initial capital support and additional capital, allowing them to increase their liquidity buffer. Second, they are more trusted by the local community because they are perceived as having better stability. Third, they are oriented to regional economic development. As a result, the relationship with customers is closer, which reduces the default financing risk due to low moral hazard.

Table 6

Moderating Effect of Ownership

Variable	ROA		ROE	
	Fixed Effect	Random Effect	Fixed Effect	Random Effect
LR	-0.0074*** (0.0000)	-0.0036*** (0.0000)	-1.0181*** (0.0000)	-0.9143*** (0.0000)
LR*owner	0.0071*** (0.0000)	0.0036*** (0.0000)	1.0538*** (0.0000)	0.8550*** (0.0020)
Lasset	-0.0062	0.0015***	5.2066***	6.6650***

Variable	ROA		ROE	
	Fixed Effect	Random Effect	Fixed Effect	Random Effect
	(0.1340)	(0.3730)	(0.0000)	(0.0000)
Lerner	0.0229***	0.0198***	5.0142***	4.8473***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
CAR	-0.1113***	-0.0799***	-8.7370**	-9.8425***
	(0.0000)	(0.0000)	(0.0170)	(0.0030)
NPF	-0.0016***	-0.0013***	-0.4920***	-0.5083***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LGRDP	0.0422**	0.0018	8.7021*	2.3024***
	(0.0180)	(0.2680)	(0.0755)	(0.0250)
COVID	-0.0065**	-0.0077**	-8.2309***	-8.4878***
	(0.0490)	(0.0220)	(0.0000)	(0.0000)
Constant	-0.3332**	-0.0101	-169.5220***	-120.1552***
	(0.0440)	(0.7690)	(0.0030)	(0.0000)
R-squared	0.1159	0.0201	0.0627	0.3334
Obs	5,496		5,496	
Bank	154		154	
F test	4.83***		8.16***	
LM test	456.62***		2448.17***	
Hausman	343.01***		27.83***	

Source: Primary data. Authors' estimation. Notes: The probabilities are reported in brackets. *, **, *** indicate statistically significant at $\alpha=10\%$, $\alpha=5\%$, $\alpha=1\%$. This study does not provide a common method (CE) for conserving space.

Robustness Test

This study conducted a robustness test to determine the consistency of previous results. We used the Net Profit Margin (NPM) as an alternative measure of profit (reference). The estimation results are shown in Table 7. The best estimation method was the fixed effect, following the F test, LM-test and Hausman test at the bottom of Table 7. The LR variable had a negative effect on NPM, consistent with previous findings. The interaction between LR*size and LR*owner was positive and significant, consistent with previous estimation results.

Table 7

Robustness Test

Variable	NPM			
	FE	RE	FE	RE
LR	-0.0141***	-0.0087***	-0.0145***	-0.0095***
	(0.0000)	(0.0010)	(0.0000)	(0.0000)
LR*size	0.0111	0.0058*	-	-
	(0.0070)	(0.0585)	-	-
LR*owner	-	-	0.0141***	0.0088***
	-	-	(0.0010)	(0.0095)
Lasset	0.0230	0.0166*	0.0218	0.0182**
	(0.2630)	(0.0710)	(0.2890)	(0.0460)

Variable	NPM			
	FE	RE	FE	RE
Lerner	0.0426*** (0.0000)	0.0381*** (0.0000)	0.0435*** (0.0000)	0.0386*** (0.0000)
Car	-0.0887* (0.0980)	-0.0834* (0.0600)	-0.0902* (0.0920)	-0.0852* (0.0550)
Npf	-0.1173* (0.0735)	-0.1147* (0.0605)	-0.1213* (0.0665)	-0.1149* (0.0600)
LGRDP	0.0109 (0.9040)	0.0013 (0.8880)	0.0198 (0.8250)	0.0018 (0.8400)
COVID	-0.0156 (0.4990)	-0.0176 (0.4460)	-0.0159 (0.4920)	-0.0178 (0.4390)
Constant	-0.4782 (0.5630)	-0.2579 (0.1630)	-0.5581 (0.5000)	-0.2900 (0.1160)
R-squared	0.0140	0.0136	0.0148	0.0144
Obs	5495	5495	5495	5495
Bank	154	154	154	154
F test	2.90***		2.92***	
LM test	214.91***		219.89***	
Hausman	28.74***		25.81***	

Source: Primary data. Authors' estimation. Notes: The probabilities are reported in brackets. *, **, *** indicate statistically significant at $\alpha=10\%$, $\alpha=5\%$, $\alpha=1\%$. This study does not provide a common method (CE) for conserving space

CONCLUSION

Our paper examines the effect of liquidity risk, market competition, and several bank variables on the profitability of SRBs. This study investigates 154 banks from 2015 to 2023, with quarterly data. We used a panel regression model to estimate the effect of liquidity risk on profit. The results show that liquidity risk has a negative effect on profits. Large SRBs encounter a lower risk of profit decline than small SRBs, as they encounter high liquidity risk. The local state-owned SRBs are more effective in mitigating the negative impact of funding risk on profitability than private SRBs. The control variable shows that strong market power and bank fundamentals have a positive effect on the profitability of SRBs. Also, booming economic conditions support profitability.

Our results provide policymakers and Shariah rural banks with key information for framing effective policies to control liquidity risks. First, OJK, as a regulator, supervises the liquidity risk management of SRBs to ensure that the negative impact of mismatched maturity on profits is relatively small. Second, SRBs must conduct thorough customer selection and rigorous financing monitoring, as they tend to make riskier investments when they have higher liquidity risk. Third, SRBs must strengthen bank fundamentals, such as efficiency, and reduce non-performing financing to increase their profits.

Some limitations of this study warrant attention. First, alternative measures of liquidity risk should be used, such as the Net Stable Funding Ratio (NSFR), which measures long-term liquidity resilience in accordance with Basel III standards. Second,

this study used static panel regression. Future research should employ dynamic panel regression, given the persistent nature of profits.

Author Contributions

Conceptualization	S.R., A.W., N.C.A., & Z.H.	Resources	S.R., A.W., N.C.A., & Z.H.
Data curation	S.R., A.W., N.C.A., & Z.H.	Software	S.R., A.W., N.C.A., & Z.H.
Formal analysis	S.R., A.W., N.C.A., & Z.H.	Supervision	S.R., A.W., N.C.A., & Z.H.
Funding acquisition	S.R., A.W., N.C.A., & Z.H.	Validation	S.R., A.W., N.C.A., & Z.H.
Investigation	S.R., A.W., N.C.A., & Z.H.	Visualization	S.R., A.W., N.C.A., & Z.H.
Methodology	S.R., A.W., N.C.A., & Z.H.	Writing – original draft	S.R., A.W., N.C.A., & Z.H.
Project administration	S.R., A.W., N.C.A., & Z.H.	Writing – review & editing	S.R., A.W., N.C.A., & Z.H.

All authors have read and agreed to the published version of the manuscript.

Funding

This study received no direct funding from any institution.

Institutional Review Board Statement

The study was approved by Program Studi Ekonomi Syariah (S1), Institut Syariah Negeri Junjungan Bengkalis, Kab. Bengkalis, Indonesia.

Informed Consent Statement

Informed consent was not required for this study.

Data Availability Statement

The data presented in this study are available on request from the corresponding author.

Acknowledgments

The authors thank Program Studi Ekonomi Syariah (S1), Institut Syariah Negeri Junjungan Bengkalis, Kab. Bengkalis, Indonesia for administrative support for this study.

Conflicts of Interest

The authors declare no conflicts of interest.

REFERENCES

- Abasimel, N. A. (2023). Islamic banking and economics: Concepts and instruments, features, advantages, differences from conventional banks, and contributions to economic growth. *Journal of the Knowledge Economy*, 14(2), 1923–1950. <https://doi.org/10.1007/s13132-022-00940-z>
- Abbas, F., Ali, S., Yousaf, I., & Wong, W.-K. (2021). Dynamics of funding liquidity and risk-taking: Evidence from commercial banks. *Journal of Risk and Financial Management*, 14(6), 281. <https://doi.org/10.3390/jrfm14060281>
- Abdelaziz, H., Rim, B., & Helmi, H. (2022). The interactional relationships between credit risk, liquidity risk and bank profitability in MENA region. *Global Business Review*, 23(3), 561–583. <https://doi.org/10.1177/0972150919879304>
- Abdo, K. Y. M., Md. Noman, A. H., & Hanifa, M. H. (2022). Exploring the dynamics of bank liquidity holding in Islamic and conventional banks. *International Journal of Islamic and Middle Eastern Finance and Management*, 16(3), 557–575. <https://doi.org/10.1108/IMEFM-02-2021-0068>



- Acharya, V., & Naqvi, H. (2012). The seeds of a crisis: A theory of bank liquidity and risk taking over the business cycle. *Journal of Financial Economics*, 106(2), 349–366. <https://doi.org/10.1016/j.jfineco.2012.05.014>
- Addou, K. I., Boulanouar, Z., Anwer, Z., Bensghir, A., & Ramadilli Mohammad, S. M. (2024). The impact of Basel III regulations on solvency and credit risk-taking behavior of Islamic banks. *International Journal of Islamic and Middle Eastern Finance and Management*, 17(5), 915–935. <https://doi.org/10.1108/IMEFM-05-2024-0248>
- Adwan, S., Alhaj-Ismail, A., & Girardone, C. (2020). Fair value accounting and value relevance of equity book value and net income for European financial firms during the crisis. *Journal of International Accounting, Auditing and Taxation*, 39, 100320. <https://doi.org/10.1016/j.intaccudtax.2020.100320>
- Ahmad, N., Naveed, A., Ahmad, S., & Butt, I. (2020). Banking sector performance, profitability, and efficiency: A citation-based systematic literature review. *Journal of Economic Surveys*, 34(1), 185–218. <https://doi.org/10.1111/joes.12346>
- Al-Sari, A. (2025). The collapse of Silicon Valley Bank: A critical analysis of regulatory shortcomings and risk management under Basel III. *Journal of Banking Regulation*, 26(4), 661–677. <https://doi.org/10.1057/s41261-025-00281-2>
- Ardana, Y., & Nurmalia, G. (2025). Determination of Islamic social responsibility disclosure in Indonesian Sharia commercial banks. *Economics, Finance, and Business Review*, 2(1), 32–42. <https://doi.org/10.20885/efbr.vol2.iss1.art4>
- Arif, A., & Anees, A. N. (2012). Liquidity risk and performance of banking system. *Journal of Financial Regulation and Compliance*, 20(2), 182–195. <https://doi.org/10.1108/13581981211218342>
- Berrospide, J. M. (2021). Bank liquidity hoarding and the financial crisis: An empirical evaluation. *The Quarterly Journal of Finance*, 11(4), 2150020. <https://doi.org/10.1142/S2010139221500208>
- Bilal, Z., AlGhazali, A., & Samour, A. (2024). GCC banks liquidity and financial performance: Does the type of financial system matter? *Future Business Journal*, 10(1), 57. <https://doi.org/10.1186/s43093-024-00348-y>
- Birindelli, G., Ferretti, P., Ferri, G., & Savioli, M. (2022). Regulatory reform and banking diversity: Reassessing Basel 3. *Annals of Finance*, 18(4), 429–456. <https://doi.org/10.1007/s10436-021-00406-3>
- Dahir, A. M., Mahat, F. B., & Ali, N. A. B. (2018). Funding liquidity risk and bank risk-taking in BRICS countries: An application of system GMM approach. *International Journal of Emerging Markets*, 13(1), 231–248. <https://doi.org/10.1108/IJoEM-03-2017-0086>
- Dahir, A. M., Mahat, F. B., Razak, N. H. A., & Bany-Arifin, A. N. (2019). Capital, funding liquidity, and bank lending in emerging economies: An application of the LSDVC approach. *Borsa Istanbul Review*, 19(2), 139–148. <https://doi.org/10.1016/j.bir.2018.08.002>
- Dias, R. (2021). Capital regulation and bank risk-taking – New global evidence. *Accounting & Finance*, 61(1), 847–884. <https://doi.org/10.1111/acfi.12595>
- Eltweri, A., Sawan, N., Al-Hajaya, K., & Badri, Z. (2024). The influence of liquidity risk on financial performance: A study of the UK's largest commercial banks. *Journal of Risk and Financial Management*, 17(12), 580. <https://doi.org/10.3390/jrfm17120580>
- Fungacova, Z., Turk, R., & Weill, L. (2021). High liquidity creation and bank failures. *Journal of Financial Stability*, 57, 100937. <https://doi.org/10.1016/j.jfs.2021.100937>

- Ghenimi, A., Chaibi, H., & Omri, M. A. B. (2020). Liquidity risk determinants: Islamic vs conventional banks. *International Journal of Law and Management*, 63(1), 65–95. <https://doi.org/10.1108/IJLMA-03-2018-0060>
- Gunawan, I., & Soma, A. M. (2025). Why do bank risks affect stock returns? Examining the mediating role of profitability in Indonesia's tier-1 banks. *Journal of Islamic Economics Lariba*, 11(2), 815–846. <https://doi.org/10.20885/jielariba.vol11.iss2.art7>
- Hassan, M. K., Khan, A., & Paltrinieri, A. (2019). Liquidity risk, credit risk and stability in Islamic and conventional banks. *Research in International Business and Finance*, 48, 17–31. <https://doi.org/10.1016/j.ribaf.2018.10.006>
- Hendri, Z., Wulandari, E., & Sollehudin Shuib, M. (2025). Do we need large Islamic rural banks? *Economics, Finance, and Business Review*, 2(1), 1–11. <https://doi.org/10.20885/efbr.vol2.iss1.art1>
- Hidayah, N., & Karimah, N. A. (2023). Are sharia financing schemes profitable? The case of Islamic rural banks in Indonesia. *EL DINAR: Jurnal Keuangan Dan Perbankan Syariah*, 11(1), 58–76. <https://doi.org/10.18860/ed.v11i1.19561>
- Hoque, H., & Liu, H. (2023). Impact of bank regulation on risk of Islamic and conventional banks. *International Journal of Finance & Economics*, 28(1), 1025–1062. <https://doi.org/10.1002/ijfe.2462>
- Hsieh, M., & Lee, C. (2020). Bank liquidity creation, regulations, and credit risk. *Asia-Pacific Journal of Financial Studies*, 49(3), 368–409. <https://doi.org/10.1111/ajfs.12295>
- Hung, J.-C., Su, J.-B., Chang, M. C., & Wang, Y.-H. (2020). The impact of liquidity on portfolio value-at-risk forecasts. *Applied Economics*, 52(3), 242–259. <https://doi.org/10.1080/00036846.2019.1644442>
- Hussain, S., & Rasheed, A. (2022). Impact of capital adequacy, liquidity management and credit risk management on economic performance: Evidence from Pakistan. *Journal of Social Sciences and Management Studies*, 1(4), 44–56. <https://doi.org/10.56556/jssms.v1i4.346>
- Ibrahim, M. H., & Rizvi, S. A. R. (2017). Do we need bigger Islamic banks? An assessment of bank stability. *Journal of Multinational Financial Management*, 40, 77–91. <https://doi.org/10.1016/j.mulfin.2017.05.002>
- Imbierowicz, B., & Rauch, C. (2014). The relationship between liquidity risk and credit risk in banks. *Journal of Banking & Finance*, 40, 242–256. <https://doi.org/10.1016/j.jbankfin.2013.11.030>
- Jusuf, N., & Widarjono, A. (2024). Funding liquidity risk, bank-specific variables and profitability of Islamic rural banks. *IQTISHADUNA: Jurnal Ilmiah Ekonomi Kita*, 13(2), 434–450. <https://doi.org/10.46367/iqtishaduna.v13i2.2227>
- Khan, S. N. (2024). How bank-specific factors affect access to financing for small and medium enterprises: Evidence from an emerging economy. *International Journal of Finance & Economics*, 29(2), 2095–2115. <https://doi.org/10.1002/ijfe.2771>
- Ledhem, M. A., & Mekidiche, M. (2020). Economic growth and financial performance of Islamic banks: A CAMELS approach. *Islamic Economic Studies*, 28(1), 47–62. <https://doi.org/10.1108/IES-05-2020-0016>
- Lestari, L. B., Yeni, A. A. P., & Ayu, A. Y. (2026). Determinants of non-performing financing of Islamic rural banks in Indonesia. *Economics, Finance, and Business Review*, 2(2), 100–112. <https://doi.org/10.20885/efbr.vol2.iss2.art4>



- Li, X., Feng, H., Zhao, S., & Carter, D. A. (2021). The effect of revenue diversification on bank profitability and risk during the COVID-19 pandemic. *Finance Research Letters*, 43, 101957. <https://doi.org/10.1016/j.frl.2021.101957>
- Li, Y., & Peng, W. (2024). Bank price competition and enterprise innovation—Based on empirical evidence of Chinese A-share listed companies. *International Review of Financial Analysis*, 91, 103004. <https://doi.org/10.1016/j.irfa.2023.103004>
- Madugu, A. H., Ibrahim, M., & Amoah, J. O. (2020). Differential effects of credit risk and capital adequacy ratio on profitability of the domestic banking sector in Ghana. *Transnational Corporations Review*, 12(1), 37–52. <https://doi.org/10.1080/19186444.2019.1704582>
- Megeid, N. S. A. (2017). Liquidity risk management: Conventional versus islamic banking system in Egypt. *Journal of Islamic Accounting and Business Research*, 8(1), 100–128. <https://doi.org/10.1108/JIABR-05-2014-0018>
- Miklian, J., & Hoelscher, K. (2022). SMEs and exogenous shocks: A conceptual literature review and forward research agenda. *International Small Business Journal*, 40(2), 178–204. <https://doi.org/10.1177/02662426211050796>
- Mikou, S., Lahrichi, Y., & Achchab, S. (2024). Liquidity risk management in Islamic banks: Review of the literature and future research perspectives. *European Journal of Studies in Management and Business*, 29, 56–73. <https://doi.org/10.32038/mbrq.2024.29.04>
- Mogaji, E., & Nguyen, N. P. (2022). Managers' understanding of artificial intelligence in relation to marketing financial services: Insights from a cross-country study. *International Journal of Bank Marketing*, 40(6), 1272–1298. <https://doi.org/10.1108/IJBM-09-2021-0440>
- Mustafa, O. A. O. (2020). Impact of liquidity shortage risk on financial performance of Sudanese Islamic banks. *International Journal of Islamic Economics and Finance (IJIEF)*, 3(2), 251–282. <https://doi.org/10.18196/ijief.3229>
- Neves, M. E., Proença, C., & Dias, A. (2020). Bank profitability and efficiency in Portugal and Spain: A non-linearity approach. *Journal of Risk and Financial Management*, 13(11), 284. <https://doi.org/10.3390/jrfm13110284>
- Oktaviana, U. K. & Titis Miranti. (2025). Modeling technology and profitability as moderators of competition, efficiency, and risk in Islamic bank stability. *Journal of Islamic Economics Lariba*, 11(2), 1049–1078. <https://doi.org/10.20885/jielariba.vol11.iss2.art15>
- Otoritas Jasa Keuangan. (2024). Laporan publikasi keuangan perbankan [Banking financial publication report] [HTML]. *Otoritas Jasa Keuangan*. <https://ojk.go.id/id/kanal/perbankan/data-dan-statistik/laporan-keuangan-perbankan/Default.aspx>
- Pamikatsih, M., & Purwanto, P. (2025). Competition and profitability of Sharia rural banks in Indonesia. *Economics, Finance, and Business Review*, 2(2), 88–99. <https://doi.org/10.20885/efbr.vol2.iss2.art3>
- Pratami, A., Roslan, M. N. H., & Ismail, I. (2025). Determinants of financing in Indonesian Islamic banking. *Economics, Finance, and Business Review*, 2(2), 67–77. <https://doi.org/10.20885/efbr.vol2.iss2.art1>
- Prenaj, V., Imeraj, J., & Smajli, S. (2023). Albania and kosovo with development potential, but limited support from the banking sector. *International Journal of Sustainable Development and Planning*, 18(5), 1377–1383. <https://doi.org/10.18280/ijstdp.180507>

- Priyadi, U., Utami, K. D. S., Muhammad, R., & Nugraheni, P. (2021). Determinants of credit risk of Indonesian Shari'ah rural banks. *ISRA International Journal of Islamic Finance*, 13(3), 284–301. <https://doi.org/10.1108/IJIF-09-2019-0134>
- Putri, D. W. E. P., & Misbah, H. (2025). The impact of funding risk on the stability of Islamic rural banks in Indonesia. *Economics, Finance, and Business Review*, 2(1), 12–21. <https://doi.org/10.20885/efbr.vol2.iss1.art2>
- Putri, D. W. E. P., & Widarjono, A. (2023). Effect of stability and funding risk on shariah rural bank's profitability. *Jurnal Ekonomi Syariah Teori Dan Terapan*, 10(6), 620–631. <https://doi.org/10.20473/vol10iss20236pp620-631>
- Rahmadany, A. N., Rifsandy, T., Achsanta, A. F., & Rifai, B. (2024). Liquidity and credit risks during the COVID-19 pandemic: Evidence from a dual banking system. *Journal of Islamic Accounting and Business Research*. <https://doi.org/10.1108/JIABR-11-2023-0407>
- Rita, S. D., & Sugiarti, D. (2025). Islamic performance index and profitability with the moderating role of intellectual capital in Indonesian Islamic banks. *Economics, Finance, and Business Review*, 2(1), 43–54. <https://doi.org/10.20885/efbr.vol2.iss1.art5>
- Rokhim, R., & Min, I. (2020). Funding liquidity and risk taking behavior in Southeast Asian banks. *Emerging Markets Finance and Trade*, 56(2), 305–313. <https://doi.org/10.1080/1540496X.2018.1483230>
- Rudhani, L. H., & Balaj, D. (2019). Management of liquidity risk and the banking activity: The banking system of Kosovo as a case. *International Journal of Finance & Banking Studies*, 8(2), 1–8. <https://doi.org/10.20525/ijfbs.v8i2.299>
- Saif-Alyousfi, A. Y. H. (2020). Determinants of bank profitability: Evidence from 47 Asian countries. *Journal of Economic Studies*, 49(1), 44–60. <https://doi.org/10.1108/JES-05-2020-0215>
- Siddique, A., Khan, M. A., & Khan, Z. (2021). The effect of credit risk management and bank-specific factors on the financial performance of the South Asian commercial banks. *Asian Journal of Accounting Research*, 7(2), 182–194. <https://doi.org/10.1108/AJAR-08-2020-0071>
- Smaoui, H., Mimouni, K., Miniaoui, H., & Temimi, A. (2020). Funding liquidity risk and banks' risk-taking: Evidence from Islamic and conventional banks. *Pacific-Basin Finance Journal*, 64, 101436. <https://doi.org/10.1016/j.pacfin.2020.101436>
- Spada, A., Fiore, M., & Galati, A. (2024). The impact of education and culture on poverty reduction: Evidence from panel data of European countries. *Social Indicators Research*, 175, 927–940. <https://doi.org/10.1007/s11205-023-03155-0>
- Sudarsono, H., Afriadi, F., & Suciningtias, S. A. (2021). Do stability and size affect the profitability of Islamic rural bank in Indonesia? *Jurnal Ekonomi & Keuangan Islam*, 7(2), 161–174. <https://doi.org/10.20885/jeki.vol7.iss2.art5>
- Sudarsono, H., Hendrie Anto, M., & Perdana, A. (2024). Financial risk determinants in Islamic rural banks: Static and dynamic models. *Jurnal Ekonomi Pembangunan*, 22(1), 54–72. <https://doi.org/10.22219/jep.v22i01.33404>
- Sunarsih, S., Al Hashfi, R. U., Munawaroh, U., & Suhari, E. (2022). Nexus of risk and stability in Islamic banks during the pandemic: Evidence from Indonesia. *Journal of Islamic Monetary Economics and Finance*, 8(4), 599–614. <https://doi.org/10.21098/jimf.v8i4.1444>
- Sutrisno, S., & Widarjono, A. (2024). Determinants of capital buffer in Islamic banks: The lesson from Indonesia. *Cogent Business & Management*, 11(1), 2331707. <https://doi.org/10.1080/23311975.2024.2331707>



- Trinugroho, I., Risfandy, T., & Ariefianto, M. D. (2018). Competition, diversification, and bank margins: Evidence from Indonesian Islamic rural banks. *Borsa Istanbul Review*, 18(4), 349–358. <https://doi.org/10.1016/j.bir.2018.07.006>
- Wang, C., & Zhuang, L. (2022). Bank liquidity and the risk-taking channel of monetary policy: An empirical study of the banking system in China. *PLOS ONE*, 17(12), e0279506. <https://doi.org/10.1371/journal.pone.0279506>
- Wasiaturrahma, Sukmana, R., Ajija, S. R., Salama, S. C. U., & Hudaifah, A. (2020). Financial performance of rural banks in Indonesia: A two-stage DEA approach. *Heliyon*, 6(7), e04390. <https://doi.org/10.1016/j.heliyon.2020.e04390>
- Wastuti, W., Thalib, H. A. H., & Fitriyanto, A. (2025). The determinants of Islamic rural banks' efficiency in Indonesia. *International Journal of Islamic Economics and Finance (IJIEF)*, 8(1), 58–81. <https://doi.org/10.18196/ijief.v8i1.21491>
- Widarjono, A., & Anto, M. B. H. (2020). Does market structure matter for Islamic rural banks' profitability? *Jurnal Keuangan Dan Perbankan*, 24(4), 393–406. <https://doi.org/10.26905/jkdp.v24i4.4810>
- Widarjono, A., Anto, M. B. H., & Fakhrunnas, F. (2020). Financing risk in Indonesian islamic rural banks: Do financing products matter? *The Journal of Asian Finance, Economics and Business*, 7(9), 305–314. <https://doi.org/10.13106/JAFEB.2020.VOL7.NO9.305>
- Widarjono, A., Suseno, P., Utami Rika Safitri, D., Yaseen, A., Azra, K., & Nur Hidayah, I. (2023). Islamic bank margins in Indonesia: The role of market power and bank-specific variables. *Cogent Business & Management*, 10(2), 2202028. <https://doi.org/10.1080/23311975.2023.2202028>
- Widarjono, A., Wijayanti, D., & Suharto, S. (2022). Funding liquidity risk and asset risk of Indonesian Islamic rural banks. *Cogent Economics & Finance*, 10(1), 2059911. <https://doi.org/10.1080/23322039.2022.2059911>