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Does Islamic Banking Performance Enhance Social Welfare? Evidence from Indonesia

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ABSTRACT
This study examines the influence of Islamic banking performance on social welfare in Indonesia, focusing on Shariah Non-compliance Risk (SNCR) and its relationship with the Capital Adequacy Ratio (CAR), unemployment, and Gross Domestic Product (GDP). SNCR occurs when Islamic banks fail to comply with Shariah principles, potentially leading to operational risks. Using panel data from 13 Islamic banks during 2017–2020, this research applies the Three-Stage Least Squares (3SLS) method to analyze the interaction between financial performance, macroeconomic indicators, and social welfare. Results show that higher CAR and unemployment tend to increase SNCR, while greater profitability, sufficient liquidity, and stable inflation help reduce it. Interestingly, although SNCR poses operational challenges, it has a positive impact on social welfare as reflected in GDP growth. This suggests that Islamic banks, despite Shariah compliance risks, still contribute to economic development. These findings emphasize the need for strong governance, effective risk control, and supportive economic policies. The study recommends that regulators enhance Shariah supervision and develop policies that strengthen financial stability while enabling Islamic banks to support national welfare goals. Overall, the research contributes to understanding how Islamic banking can balance financial soundness and social responsibility in the context of a growing Shariah-compliant financial system.

1. INTRODUCTION

Since the 1940s, Islamic banks have emerged into the banking world with a newer and more ethical concept than conventional banks. This movement began in Pakistan and Malaysia, followed by the establishing of the Islamic Rural Bank in Mit Ghamr, Egypt in 1963 (Nofinawati, 2015). In recent years, Islamic banking has been widely adopted by non-Muslim majority countries. The development of Islamic banks has continued to experience positive growth. According to the Islamic Finance Development Indicator (IFDI), in 2022, the global Islamic finance industry grew by 11%, with total assets reaching $4.5 trillion (Islamic Corporation Development, 2023).

During the global pandemic, the Islamic finance sector demonstrated resilience in 2020 by increasing total assets by 14%. The following year, there was an even more impressive increase of up to 17%. As vaccinations became widespread and economies began to recover, there was significant expansion in non-core Islamic finance areas such as Tajikistan (84%), Burkina Faso (27%), and Ethiopia (26%). Overall, in that year, the global Islamic finance sector managed to grow by 17%, reaching $2.8 trillion (Eshimov, 2023). The assets of Islamic finance are expected to continue growing, reaching $6.6 trillion by 2027 (Islamic Corporation Development, 2023).

Islamic banking in Indonesia has shown significant growth in recent years, with 14 Sharia Commercial Banks (BUS), 19 Sharia Business Unit of a Conventional Banks (UUS), and 164 Sharia Rural Banks established since 1999 (Anwar et al., 2020). Based on the OJK report, as of the end of December 2023, the total Islamic financial assets in Indonesia, excluding Islamic stocks, reached IDR 2,582.25 trillion, showing an increase from the previous achievement of IDR 2,368.24 trillion (an increase of 9.04% year-over-year). In terms of quality, the Islamic Finance Development Report 2023 ranks Indonesia as 3rd in global Islamic finance (Otoritas Jasa Keuangan, 2024). Coupled with the projected Muslim population, which is expected to exceed 25% of the world's total population by 2030, the demand for Shariah-compliant financial products and services is anticipated to rise (Anwar et al., 2020).

Islamic banks and conventional banks have very significant differences in concept and method, especially in interest (riba), uncertainty (gharar), and gambling (maysir) (Eshimov, 2023). Islamic banks are prohibited from generating income from interest (riba), and any funds derived from such transactions are considered non-halal (Usmani, 2021). That income must be donated to charity. This leads to Shariah Non-Compliance Risk (SNCR), where Islamic banks cannot recognize

this income and must absorb the associated losses. In contrast, conventional banks are not restricted by these rules and can generate and keep income from interest without facing SNCR (Lailiya & Kusumaningtias, 2024).

Shariah non-compliant risk (SNCR) is the risk associated with the inability or failure of Islamic financial institutions to adhere to Shariah principles (Oz et al., 2016). Operationally, Islamic banks must adhere to Shariah principles, which include prohibitions on investing in businesses related to alcohol, gambling, and usury-based products. Failure to comply with these principles can result in SNCR and damage the bank's reputation (Basiruddin & Ahmed, 2020). Conventional banks do not follow these restrictions and can invest in a wider range of businesses, thus avoiding the same SNCR risks. To ensure Shariah compliance, Islamic banks require a robust supervisory system, while conventional banks focus more on managing financial and operational risks without needing to consider religious principles (Lee et al., 2022).

The presence of Shariah non-compliant risk in Islamic banks can impact their performance, particularly in relation to the capital adequacy ratio (CAR). Research by (Odunga et al., 2013) suggests that risk-based ratios have a significant positive effect on a bank's operational efficiency, indicating that CAR is related to SNCR. A higher CAR increases public trust in Islamic banks, compelling them to maintain their reputation for Shariah compliance in order to preserve the confidence of customers and investors. However, Shariah non-compliant income (SNCI) in Islamic banks cannot be used for operational activities and must instead be directed toward community welfare, such as infrastructure development, public interests, and other causes (Syafina & Nurwani, 2021). Thus, income generated from Shariah non-compliance in Islamic banks has a correlation with community welfare.

Research by (Ramdani & Kamal, 2023) highlight the impact of Good Corporate Governance (including the size of the Shariah supervisory board, the size of the board of commissioners, the size of independent commissioners, the size of the board of directors, the size of the audit committee, and the frequency of meetings) on Shariah Non-Compliant Risk (SNCR). The results indicate that, collectively, all independent variables influence Shariah non-compliant risk. However, on an individual basis, certain variables like the size of the Shariah supervisory board, the size of the board of commissioners, the size of the audit committee, and the frequency of board meetings do not have an impact on Shariah non-compliant risk. More specifically, research result by (Lee et al., 2022) suggests that Shariah non-compliant risk can be a factor in bank

failure, as it can reduce the capital adequacy ratio. At the same time, however, the presence of Shariah non-compliant risk has a positive impact on social welfare through GDP.

Based on previous research, this paper aims to examine how the performance of Islamic banking in Indonesia influences social welfare, focusing on Shariah non-compliance risk and its effects on capital adequacy ratios (CAR) and social welfare measured through GDP. It sets a clear objective to balance the relationship between maintaining effective Islamic Financial Institutions (IFIs) operations and improving social welfare. This study requires measuring the impact brought by Islamic banking, so the researchers use the Three-Stage Least Squares (3SLS) model specification.

2. LITERATURE REVIEW

Islamic Banking Performance

The measurement of a company's performance still widely relies on financial ratios, such as CAMELS (Capital, Asset, Management, Earnings, Liquidity, Sensitivity to Market Risk) (Al Ghifari et al., 2015). Islamic banks must have strong capital to maintain customer trust, as robust capital also enables the bank to expand its business (Andhika & Suprayogi, 2017). (Muhammad, 2011) states that the capital of Islamic banks consists of core capital and quasi-equity. Core capital comes from shareholders' paid-in capital, reserves, and retained earnings, while quasi-equity consists of funds recorded in profit-sharing accounts (mudharabah). Core capital functions as a buffer and loss absorber, protecting the interests of deposit (wadiah) and loan (qard) account holders, whereas quasi-equity can only bear risks associated with assets financed by profit-sharing accounts after it has been proven that the risk did not arise from the bank management's negligence as the mudharib.

The framework for calculating bank capital is based on Basel regulations. The implementation of Basel III in Indonesia is governed by PBI No.15/12/PBI/2013 concerning the Minimum Capital Requirements for Commercial Banks and OJK Regulation No.11/POJK.03/2016. In Islamic banks, the application of Basel III has been adjusted to comply with Shariah principles. The health assessment of Islamic banks is regulated by OJK Regulation No.8/POJK.03/2024 concerning the Soundness Level Assessment of Islamic Commercial Banks and Islamic Business Units (Marlyna & Wirando, 2018). Under these regulations, banks are required to maintain minimum capital based on their respective risk profiles, along with additional capital buffers,

which include a capital conservation buffer (2.5% of Risk-Weighted Assets or RWA), a countercyclical buffer (0%-2.5% of RWA), and a capital surcharge for Domestic Systemically Important Banks (D-SIB) (1%-2.5% of RWA) (Andhika & Suprayogi, 2017).

The Capital Adequacy Ratio (CAR) is a ratio calculated from a bank's total capital relative to its Risk-Weighted Assets (RWA) (Marpaung & Lizabeth, 2018). CAR plays a crucial role in banking, as it reflects the bank's capital and serves as one of the benchmarks for its financial health. Banks must pay attention to the Capital Adequacy Ratio to anticipate various potential risks (Widana et al., 2021). The level of capital adequacy affects the level of liquidity. This indicates that any increase in the level of capital adequacy (CAR) will affect the increase in financing and the level of liquidity. The amount of capital of a bank will affect whether or not a bank efficiently carries out its activities and can affect the level of public trust in the bank's performance (Nuraeni, Tanuatmodjo, & Cakhyaneu, 2021).

Return on Assets (ROA) and Return on Equity (ROE) are strongly correlated with CAR (Lee et al., 2022). Both ROA and ROE are types of profitability ratios, with ROA measuring how effectively a bank's management uses its assets to generate overall profits, while ROE measures the company's effectiveness in managing shareholders' equity to produce profits (Fitriani, 2016). ROA is often considered a key indicator in evaluating the operational effectiveness of banks, as most research suggests that profitability impacts a bank's capital adequacy (Linh et al., 2019). Research by (Hafez & El-Ansary, 2015), which focused on 36 banks in Egypt from 2004 to 2013, demonstrated that ROA affects CAR. More specifically, (Prakoso, 2019) conducted a study on Islamic banks in Indonesia from 2016 to 2018, showing that ROA has a significant positive effect on CAR. Additionally, ROE also influences CAR. This is supported by research from (Bateni et al., 2014), who studied banks in Iran from 2006 to 2012 and found that both ROA and ROE have an impact on CAR. Furthermore, (Jaya, 2017) research also indicated that ROA and ROE in Indonesian national private banks during the 2004–2015 period affect CAR, although ROE was found to have a negative influence.

In addition to ROA and ROE, the Capital Adequacy Ratio (CAR) is also often influenced by liquidity ratios and inflation rates. The liquidity ratio reflects the liquid assets a bank holds to meet its financial obligations. Banks depend on short-term assets to finance their long-term assets, and sudden economic changes can lead to a liquidity crisis, which in turn can affect the Capital Adequacy Ratio (Gharaibeh, 2023). (Yolanda, 2017) investigated the factors affecting the

Capital Adequacy Ratio in 11 Islamic banks in Indonesia. The results showed that profitability ratios (ROA, ROE, NIM) and the liquidity ratio (FDR) have a significant positive impact on CAR. This aligns with the research by (Thoa & Nguyen, 2017), who observed banks in Vietnam during the 2011–2015 period and found that NIM and LIQ have a significant positive effect on CAR. Inflation rates also influence the Capital Adequacy Ratio. Simply put, when inflation rises, prices tend to increase, leading people to save their money in banks rather than spend it. The inflow of public funds into banks boosts the bank's capital health, thereby increasing the CAR (Sakinah, 2013). (Wulaningsih, 2012) conducted a study on the impact of macroeconomic variables on the Capital Adequacy Ratio, finding that inflation rates, BI rates, money supply, exchange rates, GDP, and global oil prices all influence the Capital Adequacy Ratio of conventional commercial banks in Indonesia. Furthermore, research by (Nguyen, 2020), using 22 Vietnamese banks as samples, demonstrated that inflation has a positive and significant effect on the profitability of Vietnamese banks in terms of CAR.

Shariah Non-Compliance Risk

Islamic banks are obligated to manage Shariah Non-Compliance Risk (SNCR). Shariah Non-Compliance Risk refers to the potential failure to adhere to the operational obligations of Islamic banks or principles that comply with Shariah, as established by relevant jurisdictional standards and widely accepted international Shariah standards (Rosman et al., 2017). Failure to adhere to Shariah legal obligations can negatively impact public trust, particularly among customers and investors, necessitating that Islamic financial systems ensure that Shariah non-compliant income is managed, audited, and reported (Salman, 2018). Additionally, a bank's failure to manage this risk can increase operational costs (Lailiya & Kusumaningtias, 2024). According to (Shafii et al., 2010), Shariah non-compliance risk can be managed through Shariah compliance audit programs, which report all transactional activities in Islamic bank operations and establish controls, policies, and procedures to achieve Shariah compliance.

Conventional banks use gross income to measure operational risk, while Islamic banks use Shariah Non-Compliant Income (SNCI) to measure Shariah Non-Compliance Risk (SNCR). Although both represent different types of risk, they share similar indicators (Lee et al., 2022). Research by (Odunga et al., 2013) reports that risk-based ratios have a significant positive impact

on bank operational efficiency. Islamic banks are evaluated from both financial and non-financial aspects. The financial aspects include the capital adequacy ratio (CAR) and compliance of products with Shariah principles, while non-financial aspects involve adherence to Shariah law and protecting the bank's reputation (Hanefah et al., 2020). Thus, CAR is related to SNCR; a higher CAR increases public trust in Islamic banks, compelling them to maintain Shariah compliance to preserve customer and investor confidence. (Lee et al., 2022) note that unemployment rates can affect bank operations. Rising unemployment can lead to a decrease in loan demand, increasing the risk of a decline in the proportion of income-generating resources for obligations. (Badalashvili, 2016) found that unemployment has a strong impact on the capital adequacy of banks in Greece.

Social Welfare

Social welfare is defined as the fulfillment of material, spiritual, and social needs of citizens for a decent life and the ability to develop oneself, thus enabling the performance of social functions (Sodiq, 2016). People experience well-being when they can improve their quality of life and fulfill social functions independently (Haryanto & Fitri, 2019). Islamic banks play a role in enhancing social welfare, including through Shariah Non-Compliant Income (SNCI).

Shariah Non-Compliant Income in Islamic banks cannot be used for operational activities but must be allocated to social welfare, such as infrastructure development, public interests, and other causes (Syafina & Nurwani, 2021). (Polyzos et al., 2023) note that Islamic banking systems tend to contribute to increased societal happiness. Per capita GDP serves as an informative indicator of social welfare used across various countries. Therefore, the extent of social welfare can be identified through GDP (Bergh & Antal, 2014).

Research Framework

This section aims to develop a theoretical framework that outlines the relationship between Shariah non-compliance risk, capital adequacy ratio, and social welfare. The theoretical framework serves as a foundational structure supporting the research study's theory, facilitating the explanation of the interconnections between these variable

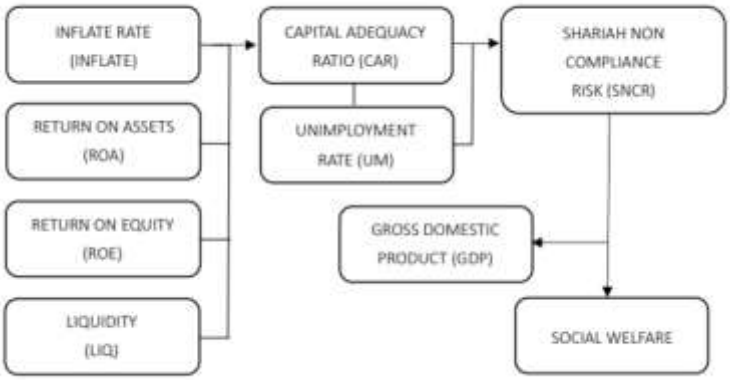

Figure 1. The Connection Between Shariah Non-Compliance Risk, Capital Adequacy Ratio, and Social Welfare

Figure 1 illustrates the interconnection between Shariah non-compliance risk (SNCR), the capital adequacy ratio (CAR), and social welfare. SNCR is depicted as a key factor influencing social welfare, often estimated through GDP. It is expected that there will be a positive relationship between these variables, suggesting that an increase in SNCR could enhance social welfare. Previous research has shown that a country's social welfare can be assessed based on its gross domestic product (GDP). Additionally, the capital adequacy ratio (CAR) and the unemployment rate are factors that influence SNCR, with an anticipated positive correlation between them. The significant relationship among these variables allows for the development of a model. CAR itself is affected by various factors, including inflation, return on assets (ROA), return on equity (ROE), and a bank's liquidity.

The precise relationship between SNCR, CAR, and social welfare remains unclear. This study addresses this gap in two keyways. Firstly, it employs a model to demonstrate how a unified theoretical framework aligns with the observed dynamics of economic growth, SNCR, and CAR. Secondly, the model is applied using data on inflation, unemployment, and GDP in Indonesian Shariah banks from 2017 to 2020, highlighting the extent to which the predicted patterns match actual observations. While previous studies have mainly focused on the benefits of Islamic finance or its comparison with conventional banking, little attention has been given to the potential risks of bankruptcy due to Shariah non-compliance or its impact on social welfare. This research builds on earlier findings, using the relationship between Shariah non-compliance

funds and social welfare as a foundation. The goal is to examine the development of Islamic financial institutions in Indonesia and explore the short-term and long-term relationships between their SNCR, the national economy, and social welfare.

3. METHODOLOGY

Data

Data collection of this research is based on secondary data from 2017 to 2020. Secondly, data refers to information that has been previously collected and published by other sources, rather than being gathered directly by the researcher. Specifically, the data used in this research consists of Annual Reports from Islamic banks, which were retrieved from the official websites of each respective bank. These reports were selected to provide comprehensive insights into the banks' operations, financial performance, and governance practices, which are crucial for analyzing the variables under study.

The population for this research comprises 14 Islamic Commercial Banks that were registered with the Financial Services Authority (OJK) of Indonesia and were in operation between the years 2017 and 2020. This period was chosen to ensure that the data reflects consistent and up-to-date practices within the Islamic banking sector during a time frame sufficient to observe trends and changes. To select the samples for this study, a purposive sampling method was employed. This non-random sampling technique was chosen to ensure that the selected banks met specific criteria relevant to the research objectives. The purposive sampling approach is particularly useful in cases where the researcher aims to focus on characteristics within a population that are most relevant to the research question.

The criteria established for selecting the sample banks were as follows:

1. Islamic Commercial Banks that were consistently registered with the OJK throughout the period from 2017 to 2020.
2. Islamic Commercial Banks that consistently published Annual Reports for each year within the 2017-2020 period.
3. Islamic Commercial Banks that consistently included the specific variable data required for this study within their published reports.
4. Based on these criteria, the final sample size determined to be suitable for analysis in this study is as follows:

Table 1. Sampling

Information	Sum
Total Population	14
Test Criterion 1 Sharia Commercial Banks that are inconsistently registered with the OJK for the period 2017, 2018, 2019 and 2020	0
Total	14
Test Criterion 2 Sharia Commercial Banks that inconsistently publish the annual report of Good Corporate Governance for the 2017- 2020 period	0
Total	14
Test Criterion 3 Sharia Commercial Banks that inconsistently display variable data needed in the study	1
Total of cualified samples	13
Total years of research	4
Amount of research data	52

Source: Data Processed, 2024

After completing the selection process of the targeted objects, a total of 13 Sharia Commercial Banks were identified as having successfully met the criteria and were thus selected as research subjects. During the third stage of the selection process, one bank, PT Bank Jabar Banten Syariah (PT BJB Syariah), did not pass the selection. This exclusion was due to PT BJB Syariah's failure to report one of the essential variables required for this study, specifically the absence of data on non-halal income.

As a result, 13 Sharia Commercial Banks were deemed eligible and selected as samples for the study covering the 2017-2020 period. Below is the list of Sharia Commercial Banks that have been included as the objects of this study:

Table 2. Name of Sample

No	Code	Sharia Commercial Banks
1	BAS	PT. Bank Aceh Syariah
2	BMI	PT. Bank Muamalat Indonesia, Tbk
3	BVS	PT. Bank Victoria Syariah
4	BRIS	PT. Bank BRI Syariah
5	BSM	PT. Bank Syariah Mandiri
6	BMS	PT. Bank Mega Syariah
7	PDS	PT. Bank Panin Dubai Syariah, Tbk
8	BSB	PT. Bank Syariah Bukopin
9	BCAS	PT. BCA Syariah
10	BTPN	PT. Bank Tabungan Pensiunan Nasional Syariah

No	Code	Sharia Commercial Banks
11	BLS	PT. Bank Aladin Syaria
12	NTB	PT. BPD NTB Syariah
13	BNIS	PT. Bank BNI Syariah

Source: Data Processed, 2024

The variables utilized in this study include Shariah Non-compliance Risk (SNCR), Capital Adequacy Ratio (CAR), Unemployment Rate (UM), Inflation Rate (INFLAT), Return on Assets (ROA), Return on Equity (ROE), Liquidity (LIQ), and Gross Domestic Product (GDP).

Analysis Technique

This study employs a quantitative approach to address the previously formulated research problems, necessitating mathematical calculations through specific statistical formulas. The data analysis technique utilized is the Three-Stage Least Squares (3SLS) method. The 3SLS method is a full-information estimation approach for simultaneous equation models, allowing for the simultaneous estimation of all equations using all available information. The core idea behind this method is to use the estimation error from the two-stage least squares (2SLS) method to construct the covariance matrix of the rsandom disturbance term, which is then used to perform generalized least squares estimation on the entire model.

The main steps in applying the 3SLS method are as follows: (1) Ensure that the model system is identifiable, with all identity equations removed; (2) Perform least squares estimation on the simplified model; (3) Use the estimator obtained as an instrumental variable to carry out two-stage least squares estimation on the model structure and calculate the estimation error; (4) Use the two-stage estimation error to construct the variance statistics of the disturbance term and perform generalized least squares estimation. Under certain conditions, the estimation results of this method exhibit better asymptotic validity compared to the two-stage least squares method. To address the limitations inherent in LU decomposition and to mitigate the excessive accumulation of errors, the method of selecting principal elements is employed. However, for a special class of positive definite matrices, all principal minors and submatrices of any order are non-singular, and all principal minors are non-zero, making the selection of principal elements unnecessary. For positive definite matrices, the efficient Cholesky decomposition method is applicable. This approach allows for highly stable model assessments with minimal error, thus enhancing the model's practical applicability.

This research focuses on 13 Islamic banks in Indonesia, utilizing panel data analysis for the specified model. Accordingly, the model for testing the hypotheses will be structured as follows:

$$LSNCR_{it} = \alpha + \beta_1 LCAR_{it} + \beta_2 LUM_{it} + \varepsilon_{it} \quad (1)$$

The model for the second hypothesis will be structured as follows:

$$LCAR_{it} = \alpha + \beta_1 LINFLAT_{it} + \beta_2 LROA_{it} + \beta_3 LROE_{it} + \beta_2 LLIQ_{it} + \varepsilon_{it} \quad (2)$$

The model for the third hypothesis will be structured as follows:

$$LUM_{it} = \alpha + \beta_1 LGDP_{it} + \varepsilon_{it} \quad (3)$$

Where LSNCR is log shariah non-compliance risk, LCAR is log capital adequacy ratio, LUM is the log unemployment rate, LINFLAT is the log inflation rate, LROA is log return on assets, LROE is log return on equity, LLIQ is log liquidity, LGDP is log gross domestic product, α is constant, β is coefficient of the regression and ε is error terms.

4. RESULT AND DISCUSSIONS

Descriptive Statics

Table 3 presents the descriptive statistics for the variables analyzed in the study. The average value of the Loan to Asset Ratio (LCAR) is 3.26, with a standard deviation of 0.67, indicating moderate variability in the LCAR among the sampled firms. The inflation rate (LINFLAT) averages 0.99, with a relatively low standard deviation of 0.29, suggesting that inflation rates are consistent across firms.

Table 3. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
LCAR	52	3.259	0.671	2.443	5.796
LINFLAT	52	0.986	0.291	0.519	1.284
LROA	50	-0.167	1.585	-3.507	2.609
LROE	49	1.255	1.813	-4.605	3.597
LLIQ	52	4.368	0.98	-2.04	6.228
LSNCR	52	19.604	1.898	12.437	23.769
LGDP	52	16.517	0.059	16.425	16.578

Source: Author's Processed

The Return on Assets (LROA) shows a mean of -0.17 with a larger standard deviation of 1.58, indicating substantial variability in profitability, with some firms experiencing significant losses. Return on Equity (LROE) has an average of 1.26 and a standard deviation of 1.81, also

showing considerable variation, reflecting differences in how effectively firms are using equity to generate profit. The Liquidity Ratio (LLIQ) has an average value of 4.37, with a standard deviation of 0.98, suggesting a relatively stable liquidity position among firms. The Loans to Non-Central Bank Reserves (LSNCR) averages 19.60, with a standard deviation of 1.90, indicating that firms generally maintain a consistent reserve ratio. Lastly, the Gross Domestic Product (LGDP) has a mean value of 16.52 with a very low standard deviation of 0.06, reflecting minimal variation in GDP across the sample.

Correlation Results

The Three-Stage Least Squares (3SLS) method, introduced in a paper by Zellner & Theil, (1992), assumes that while structural disturbances may be correlated across equations (contemporary correlation), they do not share the same variance and sequence within each structural equation. In classical specifications, this means that the interference covariance matrix within each equation is diagonal, whereas the overall covariance matrix for the system is non-diagonal. In this study, the first model includes SNCR, CAR, and UM. The dependent variable in the second model is CAR, with independent variables including INFLAT, ROA, ROE, and LIQ. Meanwhile, UM is the dependent variable in the third model, with GDP as the independent variable. The relationships and significance levels between these variables will be examined across these three reduced models.

Table 4. The Correlation Results for The First Model

Variables	(1)	(2)	(3)
(1) LSNCR	1.000		
(2) LCAR	-0.286	1.000	
(3) LUM	0.021	0.121	1.000

Source: Author's Processed

The correlation results presented in the table show the relationships between the variables LSNCR, LCAR, and LUM. In the context of ordinary correlation, a coefficient close to 1 would indicate a strong relationship between two variables. However, in 3SLS regression analysis, it is expected that exogenous variables do not have strong correlations with each other. This is important because a strong correlation between two exogenous variables could suggest a hidden relationship between other variables in the model, potentially leading to issues with

multicollinearity. From the table, we observe that the correlation between LSNCR and LCAR is -0.286, indicating a weak to moderate negative relationship. The correlation between LSNCR and LUM is 0.021, which suggests a very weak positive relationship. Similarly, the correlation between LCAR and LUM is 0.121, indicating a weak positive relationship.

None of these correlation coefficients are close to 1, which is favorable for 3SLS regression as it reduces the risk of multicollinearity. The low correlation values indicate that the relationships between the exogenous variables are not strong, thereby supporting the validity and reliability of the 3SLS regression results. Consequently, the regression model is expected to produce accurate estimates without the distortions typically caused by multicollinearity.

Table 5. The Correlation Results for The Second Model

Variables	(1)	(2)	(3)	(4)	(5)
(1) LCAR	1.000				
(2) LINFLAT	-0.225	1.000			
(3) LROA	0.539	0.096	1.000		
(4) LROE	0.242	0.159	0.837	1.000	
(5) LLIQ	-0.413	0.203	-0.139	-0.107	1.000

Source: Author's Processed

The correlation matrix presented in the table highlights the relationships between the variables LCAR, LINF, LROA, LROE, and LLIQ. In the context of 3SLS regression, it is crucial that exogenous variables do not exhibit strong correlations with each other, as this could lead to multicollinearity, which may distort the regression results. The matrix reveals that the correlation between LCAR and LROA is 0.539, indicating a moderate positive relationship, while the correlation between LROA and LROE is quite high at 0.837, suggesting a strong positive relationship. The other correlations, such as those between LCAR and LINF or LLIQ and LROA, are weaker, with none exceeding 0.413 in absolute terms.

While most of the correlations are within acceptable limits, the strong correlation between LROA and LROE raises concerns about potential multicollinearity between these two variables. In 3SLS regression, such a strong relationship could compromise the model's validity, as it indicates that these variables may not be sufficiently independent. Therefore, although most of the correlations are manageable, the high correlation between LROA and LROE should be carefully considered to ensure the robustness and reliability of the 3SLS regression results.

Table 6. The Correlation Results for The Third Model

Variables	(1)	(2)
(1) LUM	1.000	
(2) LGDP	0.614	1.000

Source: Author's Processed

The correlation results displayed in the table show the relationship between LUM and LGDP. The correlation coefficient between these two variables is 0.614, indicating a moderate positive relationship. This suggests that changes in LUM are somewhat associated with changes in LGDP. Given this correlation, it implies that movements in LUM can be used to infer changes in LGDP, which is an indicator of economic performance and, by extension, social welfare. Although the correlation is not as strong as the one typically close to 1, it still suggests a meaningful relationship between the two variables. Researchers can leverage this relationship to further explore how LUM influences LGDP and, consequently, social welfare. Following the correlation test, the next step would be to investigate this relationship more deeply using the 3SLS method, which allows for a more comprehensive understanding of how these variables interact within the model.

Table 7. Result of a diagnostic test using Cholesky

Component	Jarque-Bera	df	Probability
(1)	5.349775	2	0.1142
(2)	21.18254	2	0.0001
(3)	6.794941	2	0.1057
Joint	33.327256	6	0.0001

Source: Author's Processed

Cholesky decomposition is a powerful mathematical technique that often employs indirect algebraic methods (Krishnamurthy et al., 2020). This method decomposes a Hermitian positive definite matrix into a lower triangular matrix and its transpose, enabling efficient computation for subsequent algebraic operations. Diagnostic tests indicated a probability value of 0.0001 across the three models, demonstrating significance at the 1% level. This finding suggests that all models exhibit a normal distribution. Furthermore, these results provide strong evidence of the stability of the three models. Examining the three-layer effects—both direct and indirect—is particularly effective for assessing Shariah Non-compliance Risk.

The Results of the 3SLS Model

As shown in Table 6, which presents the results of the Three-Stage Least Squares (3SLS) model for the three models analyzed, the findings provide valuable insights into the complex relationships between key financial metrics within the framework of Islamic banking in Indonesia.

Table 8. The Result of Three Stage Least Square for Three Model.

	Coef.	St.Err.	t-value	p-value	Sig
LSNCR					
LCAR	1.18	0.585	2.02	0.044	**
LUM	1.391	0.166	8.37	0.000	***
Constant	20.963	3.821	5.49	0.000	***
LCAR					
LINFLAT	-0.45	0.201	-2.23	0.025	**
LROA	0.409	0.066	6.24	0.000	***
LROE	-0.224	0.057	-3.90	0.000	***
LLIQ	-0.197	0.059	-3.32	0.001	***
Constant	4.871	0.297	16.41	0.000	***
LUM					
LGDP	2.641	0.657	4.02	0.000	***
Constant	-41.884	10.848	-3.86	0.000	***
Mean dependent var		1.751			
Number of obs		49			

*** p<.01, ** p<.05, * p<.1

The results emphasize the significant influence of these financial indicators on Shariah Non-compliance Risk (SNCR), Capital Adequacy Ratio (CAR), and Unemployment (UM), which ultimately contribute to social welfare as reflected in GDP. In the first model, the positive impact of both Capital Adequacy Ratio (LCAR) and Unemployment Rate (LUM) on SNCR indicates that higher capital adequacy in Islamic banks may increase the risk of non-compliance with Shariah principles. This relationship can be attributed to the greater operational scale associated with higher capital adequacy, which can lead to more complex financial activities and, consequently, a higher risk of Shariah non-compliance. This finding is consistent with the research of (Basiruddin & Ahmed, 2020), who suggest that a higher CAR necessitates a more robust governance framework to manage the increased Shariah non-compliance risk. Similarly, the significant positive effect of Unemployment Rate on SNCR highlights the broader economic challenges that can exacerbate the risk of non-compliance. Rising unemployment can strain the economic environment, increasing the likelihood of deviations from Shariah principles as banks strive to maintain profitability, as observed by (Badalashvili, 2016), who noted that economic downturns,

characterized by rising unemployment, can elevate operational risks, including those related to Shariah compliance.

The second model reveals that Inflation Rate (LINFLAT), Return on Assets (LROA), Return on Equity (LROE), and Liquidity (LLIQ) significantly impact CAR. The negative correlation between inflation and CAR suggests that rising inflation erodes the capital adequacy of Islamic banks, likely due to increased operational costs and reduced profitability, which aligns with (Nguyen, 2020) findings on the adverse effects of inflationary pressures on banks' capital buffers. Conversely, the positive impact of LROA on CAR underscores the importance of effective asset management in maintaining capital adequacy. A higher return on assets signifies more efficient utilization of the bank's assets, which strengthens capital adequacy, as supported by (Prakoso, 2019), who identified ROA as a crucial determinant of CAR in Islamic banks. Interestingly, the negative relationships between LROE, LLIQ, and CAR suggest that higher returns on equity and greater liquidity may be associated with increased risk-taking or reduced need for a high capital buffer. Bateni et al. (2014) similarly noted that higher ROE could indicate more aggressive financial strategies that might compromise capital adequacy. (Yolanda, 2017) also discussed how higher liquidity, while essential for meeting short-term obligations, could diminish the requirement for a substantial capital buffer.

The third model's results show a significant positive relationship between GDP and unemployment, although the low R-squared value indicates that GDP only partially explains the variance in unemployment. This suggests that while GDP growth is generally linked to improved economic conditions, it may not directly translate into reduced unemployment within the Islamic banking context, possibly due to specific economic dynamics in Indonesia that prevent GDP growth from sufficiently addressing structural unemployment issues. This nuanced relationship between GDP and unemployment has been explored by (Lee et al., 2022), who argued that macroeconomic growth indicators may not fully capture the complexities of employment dynamics, particularly in developing economies.

Overall, the findings from the 3SLS model underscore the significant impact of Islamic banking performance, as measured by metrics such as CAR, SNCR, and unemployment, on social welfare, particularly in terms of GDP. The interconnectedness of financial stability and economic welfare in the Islamic banking sector is evident, as the management of capital adequacy, adherence to Shariah principles, and navigation of economic challenges directly influence

broader social outcomes. This conclusion is supported by (Polyzos et al., 2023), who demonstrated that Islamic banking efficiency positively contributes to societal welfare. Furthermore, (Bergh & Antal, 2014) identified GDP as a critical indicator of social welfare, with the positive impact of Islamic banking performance on GDP highlighting the vital role these institutions play in enhancing the economic well-being of the population.

5. CONCLUSION

This study has explored the influence of Islamic banking performance on social welfare in Indonesia, with particular attention to Shariah Non-compliance Risk (SNCR), Capital Adequacy Ratio (CAR), and macroeconomic variables such as unemployment and Gross Domestic Product (GDP). Utilizing the Three-Stage Least Squares (3SLS) estimation method on panel data from 13 Islamic commercial banks between 2017 and 2020, the findings demonstrate a complex and interdependent relationship between financial performance, regulatory compliance, and macroeconomic conditions.

Empirical results indicate that higher CAR and elevated unemployment rates are significantly associated with increased SNCR, suggesting that although capital buffers are designed to enhance financial resilience, they may also introduce additional compliance risks when not accompanied by adequate governance and oversight. Conversely, robust profitability, sound liquidity positions, and stable inflation are shown to mitigate SNCR, underlining the importance of maintaining strong internal financial health for Shariah adherence.

Furthermore, a positive association between SNCR and GDP growth was identified, implying that Islamic banks, even under the pressure of compliance risks, continue to contribute meaningfully to national economic development. However, the unexpected positive correlation between GDP and unemployment raises concerns about structural inefficiencies in the labor market, signaling the need for targeted economic policies that extend beyond aggregate growth and address employment quality and inclusiveness.

These findings lead to several important policy recommendations:

First, regulations governing the use of SNCR-related funds must be clearly defined. Although such funds contribute positively to social welfare, unregulated disbursement poses risks to banks' operational capital, particularly affecting CAR. Policymakers should incorporate provisions limiting SNCR fund usage into key financial sector laws, such as Law No. 4 of 2023 on the Development and Strengthening of the Financial Sector (P2SK) and OJK Regulation No. 12 of 2023 concerning the transformation of Sharia Business Units into full-fledged Islamic Commercial Banks.

Second, there is a critical need to establish a Shariah-compliant deposit insurance framework. While Indonesia's Lembaga Penjamin Simpanan (LPS) currently serves as the deposit insurer, it lacks a dedicated framework that fully aligns with Islamic principles. Drawing lessons from Malaysia's Perbadanan Insurans Deposit Malaysia (PIDM), Indonesia should develop an institutional model that ensures both depositor protection and Shariah compliance, including oversight of non-compliant income under a credible Shariah supervisory authority.

Third, Islamic banks must enhance their governance and risk management systems to effectively address rising SNCR, especially under conditions of increased capital adequacy and market volatility. This includes reinforcing the role and independence of Shariah Supervisory Boards and adopting advanced tools such as stress testing and forward-looking risk analytics to ensure institutional sustainability.

Fourth, the impact of Islamic banking activities on social welfare must be systematically monitored and evaluated. Regulatory authorities should institutionalize mechanisms to assess the effectiveness of SNCR fund allocation in supporting socioeconomic objectives such as poverty alleviation, financial inclusion, and sustainable development. These evaluations will not only inform better policy design but also help align Islamic banking practices with national welfare goals.

Fifth, stakeholder education initiatives are essential to build a deeper understanding of SNCR management. Training programs and awareness campaigns targeting bank managers, regulators, and the public can enhance the transparency and

accountability of Islamic banks while fostering broader trust in the Shariah-compliant financial system.

Despite its contributions, this study is not without limitations. The analysis is confined to Islamic commercial banks and covers data from 2017 to 2020, potentially overlooking more recent developments, including the economic repercussions of the COVID-19 pandemic and regulatory transformations thereafter. Future research should broaden the scope to include Sharia Business Units and more recent data to capture post-pandemic dynamics. Moreover, integrating qualitative perspectives from policymakers and Shariah governance actors would complement the quantitative approach and offer richer insights into compliance behavior and institutional responses.

In conclusion, this study reaffirms that Islamic banks, notwithstanding the risks of Shariah non-compliance, continue to play a vital role in advancing economic and social welfare in Indonesia. To optimize their dual mandate of financial soundness and social responsibility, it is imperative to strengthen regulatory oversight, improve institutional governance, and promote stakeholder engagement. These measures are crucial to sustaining public trust and ensuring that Islamic banking remains a resilient and inclusive pillar of the national financial system.

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