



The Effect of BOPO, NPF, CAR, FDR and CIR on Return on Assets (ROA) at Bank Syariah Indonesia (BSI) Before and After the Merger

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Abstract: The purpose of this research is to determine how the impact of Operational Expenses on Operating Income (BOPO), Non Performing Financing (NPF), Capital Adequacy Ratio (CAR), Financing to Deposit Ratio (FDR), and the Cost to Income Ratio (CIR) affect Return on Assets (ROA) on Bank Syariah Indonesia (BSI) Pre and Post Merger. The merger of Bank BRI Syariah, Bank BNI Syariah, and Bank Syariah Mandiri into BSI in February 2021 aimed to enhance operational efficiency, strengthen capital, and expand the market share of Islamic Banking. However, the debate on the effectiveness of this merger in increasing profitability continues. This study is quantitative in nature, and it employs multiple linear regression analysis alongside a comparative approach to examine the periods before and after the merger, 2017–2020 and 2021–2024, respectively. It was found that in both periods, BOPO adversely impacted ROA significantly and NPF and FDR's effects before merger became non-significant in the post-merger period while CAR and CIR remained insignificant in both periods. This research adds to the debate on the impact of mergers on Islamic banking performance and informs BSI's management and policymakers on operational and profitability post-merger targets.

Keywords: Bank Syariah Indonesia; Banking Merger; Return on Assets (ROA); Financial Ratios; Operational Efficiency

1. Introduction

Islamic banking in Indonesia plays a strategic role in supporting national economic growth through its Sharia-compliant intermediary function, which involves collecting funds from the public and channeling them back into productive and consumer financing [1]. With a Muslim majority, the market potential for Islamic banking is substantial. However, by 2024, the market share of Islamic banking had only reached 7.33% of total national banking assets, indicating a limited contribution to the national financial system [2], [3].

As a strategic step to strengthen competitiveness, business scale, and operational efficiency, the government, through the Ministry of State-Owned Enterprises, initiated the merger of three state-owned Islamic banks, BRI Syariah, BNI Syariah, and Bank Syariah Mandiri, into Bank Syariah Indonesia (BSI) in February 2021. Theoretically, the banking merger is expected to create synergies through reduced operational costs, strengthened capital structures, and increased profitability, reflected in Return on Assets (ROA) [4], [5].

Accordingly, BSI's financial performance in the years following the merger still shows different performance trends. Reviewing the data in the annual financial statements, BSI's average ROA increased from 1.06 percent in the period 2017 to 2020 to 1.32 percent in the period 2021 to 2024. Improvements in operating efficiency can also be seen, such as the BOPO ratio decreasing from 88.88 percent to 85.26 percent, and CIR decreasing from 65.95 percent to 62.24 percent. However, the NPF ratio only decreased from 2.22 percent to 1.82 percent, while CAR increased slightly from 19.87 percent to 20.20 percent, and FDR

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increased from 76.32 percent to 77.21 percent. This data shows that there are still issues that require BSI's attention to balance efficiency in operations and profitability in financial metrics, making it difficult to optimize profits while minimizing risks [6].

In both conventional and Islamic banking, previous studies have recognized numerous factors impacting ROA. Operational efficiency (BOPO) maintains a negative relationship with profitability; studies conducted in Indonesia show that efficiency also has a relationship with profitability and capital structure (CAR) [7], [8]. In the case of NPF, it generally lowers ROA because the non-performing financing reduces income and raises the costs for provisioning [9]. The relationship between CAR, FDR, and ROA has been documented differently by various studies over time [10], [11]. As an overall efficiency measure, CIR remains underutilized in studies of Islamic banking in Indonesia. This is remarkable since the variable is a résumé of the effectiveness of cost management in relation to total income, which is non-operational [12][13].

Given these conditions, there is a simultaneous analysis gap on the impact of efficiency ratios BOPO, CIR, financing risk NPF, and capital CAR and FDR on ROA in relation to the BSI merger timestamps. Existing studies mostly describe the phenomena, focusing on a handful of financial ratios and lacking a thorough analysis of inter-temporal shifts in dynamics. Thus, this study seeks to evaluate Indonesian Sharia Banks and the impact of BOPO, NPF, CAR, FDR, and CIR on ROA, determining the distinction in the impact of these variables in the pre- and post-merger timeframe. Such findings are expected to enrich the discourse on Islamic banking and the literature on mergers while providing a strategic rationale for policymakers and bank management in considering variables aimed at fortifying financial performance in the aftermath of a merger.

2. Literature Review or Related Research

2.1. Mergers and Acquisitions

A merger is a strategic business decision whereby two or more separate entities consolidate into a single entity in a bid to improve the efficiency, scale, competitiveness, and economies of the business [30]. In the realm of banking, the strategies of mergers are geared toward building more robust institutions by maximally utilizing their resources, enhancing service quality, and broadening their areas of operation [5].

As stated by Gaughan [30], mergers can fall into a distinct and several categories such as a. Horizontal Merger: Merger of two companies in the same industry, for example a merger between banks, b. Vertical Merger: Merger of companies in the same supply chain, c. Conglomerate Merger: Merger of companies from different industries.

In the context of the merger of Bank Syariah Indonesia (BSI), the merger that occurred was horizontal, where three Islamic banks, Bank Negara Indonesia Syariah (BNIS), Bank Rakyat Indonesia Syariah (BRIS), and Bank Syariah Mandiri (BSM), merged into one institution to increase competitiveness and operational efficiency.

2.2 Efficiency Theory

Efficiency is an ideal condition that allows individuals or communities to obtain maximum benefit from available resources. In the context of business and organizations, efficiency is an indicator of success, measured by the amount of resources used to achieve a specific result. In other words, efficiency is the ratio between input and output.

According to the Big Indonesian Dictionary (KBBI), efficiency is defined as the accuracy of how something is done and the ability to perform a task precisely and accurately without wasting money, time, and energy. Here is an expert definition of efficiency: According to Mulyamah, the concept of efficiency is a measure that compares planned input usage with actual usage.

As stated by S.P. Hasibuan, the notion of efficiency centers around the most favorable assessment of benefits gained in relation to the resources expended. In different words, the output measured against the set objectives [7].

In relation to a systems approach, efficiency is understood to be the equilibrium of input, process, and output. Adequately controlled inputs will undergo a defined procedure, generating outputs that achieve the defined benchmarks. In banking, efficiency signifies more than just savings in expenses; it also captures operational effectiveness that is enduring and integrated.

In the context of Islamic banking, the BOPO ratio or the “Beban Operasi per Pendapatan Operasi” translates to “Operating Costs to Operating Income” is a standard for measuring the productive efficiency of the industry. Operating costs could be all the costs incurred by the Islamic banking sector to earn revenues. BOPO being lower means the banking institution is more productive. A lower BOPO or operating ratio further suggests the bank is managing its expenses effectively, enhancing the profits, that, in this assessment, is shown by the Return on Assets (ROA).

Thus, the efficiency theory helps analyze the impact of certain financial ratios such as BOPO and CIR on the profitability of a bank. Upon the context of a merger in Islamic banking, operational efficiency post-merger is expected to significantly raise the institution’s financial performance, especially in the context of optimal asset utilization in profit generation.

2.3 Signal Theory

Corporate policies like mergers send signals to the market about the company’s expected future value, as explained by signaling theory. When businesses pursue strategic actions like mergers and acquisitions, the market reflexively views these moves as signals regarding the quality of management and the expectations of future performance [31]. When a merger is viewed favorably, it increases investor confidence as evidenced by rising stock prices, stable business performance, and increased value of the firm. On the flip side, a market perception of a negative signal can give rise to uncertainty and volatile market value. For the purposes of this research, the improvement in ROA after a merger can be seen as a favorable signal to the investors and other stakeholders concerning the effective institutional and financial management of Bank Syariah Indonesia (BSI) after the merger of three state owned Islamic banks. Hence, the theory of signaling is applicable in this scenario to understand the market’s reaction to the fundamental changes in the organizational structure and the influence on the investors’ perception.

2.4 Capital and Risk Management Theory

A well-defined capital structure ratio (CAR) and low non-performing financing ratio (NPF) are two elements that influence the sustainability and profitability of the bank. This theory suggests that banks with well-defined capital ratio structure are able to absorb risks and increase their financing expansion capacity, thus improving ROA. On the contrary, an elevated NPF ratio signifies poor financing risk, which invariably reduces revenue and profitability of the bank.

2.5 Banking Financial Performance

A business firm’s financial performance, commonly referred to within business metrics, refers to performance evaluation within the context of the firm’s profit generating capacity alongside asset, liability, and capital management. Financial performance or business performance as some may refer to it, is a qualitative and quantitative reflection of a company’s health alongside management’s capabilities and a measure of how well the firm’s resources are utilized to attain key milestones. Financial performance is assessed within the context of the firm’s financial statements which often includes a the firm’s balance sheet, a statement of income, and a cash receipts and disbursements statement.

The profitability ratio is the banking financial performance indicator used in this analysis. The profitability ratio measures profit generation effectiveness. To measure profitability, the Return on Assets (ROA), Return on Equity (ROE), and Operating Expenses to Operating Income (BOPO) ratios can be used.

Return on Assets (ROA) as a Key Indicator of Profitability

Return on Assets (ROA) is one of the measures of a bank's profitability, assessing how bank management is able to yield profit from the company's assets. In a different sense, ROA may be interpreted as a measure of how a company's resources are utilized to generate revenue. In the same way, Khrawish & Al-Sa'di [32] comment that ROA measures the efficiency of resource management to achieve profit from company operations. A company is said to be more efficient the higher its ROA, thus mark improving effectiveness of resource management.

$$\text{ROA} = \frac{\text{net profit}}{\text{total assets}}$$

2.6 Supporting Indicators: BOPO, NPF, CAR, FDR, and CIR

a. Operating Expenses to Operating Income (BOPO)

Operating Expenses to Operating Income (BOPO) is a quantitative financial metric that assesses a bank or financial institution's effectiveness. This indicator shows the level of a bank's operating expenses as compared to the operating income it receives. BOPO considers compensation to personnel rendering services, marketing plus other business overheads in relation to the operating income. With regards to performance, a lower BOPO ratio is preferred as it reflects the bank's efficiency in controlling operating expenses.

b. Non-Performing Financing (NPF) Net

Net Non-Performing Financing (NPF) is a ratio utilized to assess the degree of non-performing financing within an Islamic bank, specifically financing regarded as substandard, doubtful, and loss, less the Allowance for Earning Asset Losses (PPAP) designated for that category. This ratio reflects the Islamic bank's risk management practices as well as the bank's non-performing assets. A positive ratio signifies that performance is satisfactory, whereas a negative ratio indicates the contrary.

c. CAR (Capital Adequacy Ratio)

CAR reflects the capacity of a bank's capital to absorb losses while ensuring it can continue operations. An elevated CAR reflects the bank's financial sturdiness, offering an indicator of future expansion. Capital calculation warrant primary focus since it forms the basis for future strategic business decisions.

d. FDR (Financing to Deposit Ratio)

The FDR assesses how well a bank converts third-party funds into financing. An ideal FDR reflects productive fund management by a bank without risking excess illiquidity. FDR reflects the ratio of third-party funds to financing.

e. CIR (Cost to Income Ratio)

A bank's general management and operational efficiency can be evaluated using the Cost-to-Income Ratio (CIR). This ratio shows how much of the operating costs are in relation to the total income earned. A lower CIR is a sign of greater efficiency.

2.7 Hypothesis Development

a. The Effect of Operating Costs on Operating Income (BOPO) on ROA

BOPO refers to an efficiency ratio that assess the proportion of operating costs to operating income. A higher BOPO ratio denotes greater costs that a bank incurs to earn income which in turn lowers the efficiency and profitability of the bank [14].

The findings of this study indicate that BOPO significantly and negatively impacts ROA [15], [16], [17]. This occurs because elevated operational costs diminish the net profit a bank is capable of generating. From this explanation, the following hypothesis is formulated: H1: BOPO has a significant negative effect on ROA.

b. The Effect of Non-Performing Financing (NPF) on ROA

The level of non-performing loans (NPF) is classified as ratio of non-performing loans to total loans given out by a lending institution. A high NPF ratio indicates a greater level of non-performing assets which lowers overall asset quality. This increases the impairment allowance cost contributing towards a reduction in the lending institution's profitability [18]. Prior studies have reached the consensus that NPF has a significantly adverse effect on ROA [19] [20]. A bank's profitability increases in correlation to a decrease in the NPF ratio. With such explanations in mind. The hypothesis is set as follows:

H2: NPF berpengaruh negatif signifikan terhadap ROA.

c. The Influence of Capital Adequacy Ratio (CAR) on ROA

The Capital Adequacy Ratio (CAR) evaluates if a bank's capital is sufficient to cover the risk of losses arising from risk-weighted assets. A higher CAR indicates that a bank is able to absorb losses and is in a position to support the growth of productive assets [21]. Numerous studies have indicated that CAR positively and significantly impacts ROA, even though in some cases and timeframes the results diverged [22], [23], [24]. When banks have sufficient capital, they have the ability to increase the distribution of financing which is likely to enhance profits. From this explanation, the following hypothesis is developed:

H3: CAR has a significant positive effect on ROA.

d. The Effect of Financing to Deposit Ratio (FDR) on ROA

The FDR describes a bank's capacity to convert public deposits into loans, and a well-calibrated FDR demonstrates that funds are allocated efficiently, generating greater profit-sharing income. Prior studies have shown that FDR positively impacts ROA up to a point, beyond which it may raise liquidity risk [25], [26]. With this reasoning, the following hypothesis is proposed:

H4: FDR significantly and positively impacts ROA.

e. The Effect of Cost to Income Ratio (CIR) on ROA

CIR denotes an efficiency ratio that considers the operational costs in relation to the income, both operational and non-operational. An efficient system will have a low value of CIR. Research corroborates [13] the profitability increases with a decrease in CIR. This indicator, while seldom employed in studies of Islamic banking in Indonesia, paints a holistic picture of efficiency that is pertinent in evaluating the performance of banks. From this explanation, the following hypothesis is developed:

H5: CIR has a significant negative effect on ROA.

3. Proposed Method

3.1. Types of Research and Data

This quantitative research study examines the impact of certain financial ratios on profitability for Bank Syariah Indonesia (BSI) and compares the pre-merger and post-merger periods using a before-and-after analysis. The secondary data for this analysis were derived from the annual financial statements of BSI and its constituent banks (Bank BRI Syariah, Bank BNI Syariah, and Bank Syariah Mandiri) which were accessed from the OJK and their respective annual reports websites. The pre-merger period is defined as 2017–2020, and the post-merger period is defined as 2021–2024.

3.2. Data Source

In this study, the sample population included the annual financial reports of the Islamic banks that transformed into BSI in February 2021, which are BRI Syariah, BNI Syariah, and Bank Syariah Mandiri, along with BSI's financial reports after the merger. The sample for the study was gathered using a purposive sampling method which included the following criteria:

a. The listed banks participated in the BSI merger in 2021; b. They had full financial report data for the 2017–2024 timeframe; c. The banks were still actively operating during the study period.

3.3 Data Analysis Techniques

The simultaneous and partial impacts of the independent variables BOPO, NPF, CAR, FDR, and CIR on the dependent variable ROA for each period were analyzed with multiple linear regression. Before conducting regression analysis, normality, multicollinearity, autocorrelation, and heteroscedasticity were tested as classical assumptions. To examine the differences in the effect of certain variables across periods, a comparative analysis was conducted by splitting the dataset into two periods: pre-merger and post-merger. All computations were carried out with SPSS version 26.

4. Results and Discussion

4.1 Descriptive Statistics

These descriptive statistics summarize the trends for each variable. For the purpose of this analysis, the means and standard deviations are the relevant descriptive statistics—standard deviation because it reveals the extent of dispersion from the mean, and the mean because it provides a broad overview of the changes that have taken place, like increases in ROA and decreases in BOPO. Below is a table of descriptive statistics for the given variables:

Table 1. Results of Descriptive Statistical Tests

Variable	Before the Merger		After the Merger	
	Mean	Std. Dev.	Mean	Std. Dev.
ROA	1.06	0.54	1.32	0.67
BOPO	88.88	5.77	85.26	8.42
NPF	2.22	1.43	1.82	1.42
CAR	19.87	3.96	20.20	3.46
FDR	76.32	3.72	77.21	4.17
CIR	65.95	13.49	62.24	13.34

The information provided shows that Bank Syariah Indonesia's financial performance positively changed after the merger. The Return on Assets (ROA) improved from 1.06% during the pre-merger period to 1.32% afterwards, reflecting the bank's improved efficiency at generating profits relative to its total assets. The BOPO ratio also decreased from 88.88% to 85.26% signifying an enhancement in operational efficiency. The Non-Performing Financing (NPF) ratio also decreased from 2.22% to 1.82%, reflecting better quality financing. The Capital Adequacy Ratio (CAR) also showed a positive change increasing from 19.87% to 20.20% suggesting the bank's capital adequacy improved. There was also a small increase in the Financing to Deposit Ratio (FDR) which may signal a rise in the provision of financing in relation to third party deposits. The Cost to Income Ratio (CIR) also decreased suggesting enhanced efficiency in cost management relative to income. All in all, these adjustments led to greater efficiency and performance enhancement after a merger.

The goal of employing descriptive statistics, particularly the mean and standard deviation, is to summarize and indicate the extent of dispersion of values over time. These descriptive statistics, in particular the average and standard deviation, are crucial for

understanding the data and performing subsequent inferential analyses with difference tests or regression analyses [27], [28].

4.2 Classical Assumption Test

4.2.1 Before the Merger

a. Residual Normality Test

From the SPSS output, the skewness of the data is 0.602 and the kurtosis is 1.289, with standard errors of 0.637 and 1.232, respectively. Since the values for skewness and kurtosis are < 2 and < 3 , the residual data is roughly normally distributed. Ghozali [28] notes that values of skewness and kurtosis between -2 and $+2$ and -3 respectively are still within acceptable ranges for normality. Thus, the hypothesis of residual normality is validated while maintaining the integrity of the significance testing [29].

b. Heteroscedasticity Test (Glejser Test)

All significance values are greater than 0.05, indicating no signs of heteroscedasticity. This means the residual variance is constant and the model can be considered stable [28].

c. Multicollinearity Test

All tolerance values > 0.1 and $VIF < 10$, meaning there is no multicollinearity problem between the independent variables. This is important so that parameter estimates are not biased [27].

Autocorrelation Test

The Durbin-Watson value is 1.800. Based on the Durbin-Watson table for $n = 12$ and $k = 5$, $dU = 1.4939$ and $4-dU = 2.5061$ are obtained. Because $DW = 1.800$ is between dU and $4-dU$ ($1.4939 < DW < 2.5061$), it can be concluded that there is **no autocorrelation**, either positive or negative [29].

4.2.2 After the Merger

a. Residual Normality Test

From the SPSS output provided, the values of skewness and kurtosis are 0.755 and -0.805 respectively, with standard errors of 0.564 and 1.091. This derives the conclusion that since skewness < 2 and kurtosis < 3 , the residuals are normally distributed. Thus, suggesting the regression model fulfills the assumption of residual normality [28].

b. Heteroscedasticity Test (Glejser Test)

All significance values > 0.05 indicate no heteroscedasticity. The residual variance remains constant, thus confirming the model's reliability.

c. Multicollinearity Test

All values of tolerance are > 0.1 and $VIF < 10$, which suggests that there are no severe linear interdependencies among the independent variables which would undermine the explanation of the regression coefficient.

d. Autocorrelation Test

The value of Durbin-Watson is 2.048. Checking the Durbin-Watson table for $n = 16$ and $k = 5$ gives us $dU = 1.5937$ and $4-dU = 2.4063$. $DW = 2.048$ lies between dU and $4-dU$ ($1.5937 < DW < 2.4063$), thus concluding that there is no autocorrelation of any kind [29]. To conclude all classical assumptions are satisfied both preceding and following the merger, hence the chosen regression model is appropriate for further analysis.

4.3 Model Testing and Hypothesis Testing

4.3.1 Before the Merger

a. F Test (Goodness of Fit)

The ANOVA results indicate an F value of 158.929 with a significance level of $p = 0.000$ (< 0.05). Therefore it can be concluded that the regression model is significant in explaining the dependent variable ROA in the pre-merger period [28].

b. R-Squared Test (R^2)

The R^2 value = 0.993, meaning that 99.3% of the variation in ROA can be explained by the independent variables BOPO, NPF, CAR, FDR, and CIR, whereas the rest 0.7% is explained by other variables not captured in the model. This value suggests the model is exceptionally competent in explaining the variability of the data [27].

c. T Test (Partial)

Based on the results of partial regression analysis, it was found that before the merger, several financial ratio variables had a significant effect on the Return on Assets (ROA) of Bank Syariah Indonesia. BOPO had a significant negative effect on ROA ($p = 0.000$), which means that the higher the BOPO, the lower the operational efficiency and impact on profitability. NPF actually showed a significant positive effect on ROA ($p = 0.036$), which indicates a potential increase in income from problem financing that was successfully collected or managed well. FDR also had a significant positive effect on ROA ($p = 0.029$), which implies that increasing financing disbursement to third-party funds was able to boost profitability. Meanwhile, CAR ($p = 0.141$) and CIR ($p = 0.790$) did not have a significant effect on ROA during this period. Overall, these results indicate that before the merger, operational efficiency factors (BOPO), financing quality (NPF), and financing disbursement rate (FDR) were the main determinants of BSI's profitability.

4.3.2 After the Merger**a. F Test (Goodness of Fit)**

The F value = 119.657 with a significance of $p = 0.000$ (< 0.05) shows that the simultaneous regression model is significant in explaining the variation in ROA after the merger. [28].

b. R-Squared Test (R^2)

The R^2 value is 0.984, meaning that 98.4% of the variation in ROA can be explained by the independent variables after the merger. This also indicates that the model is very good at explaining the data.

c. T Test (Partial)

From the results of the post-merger impact analysis through the partial significance test, it was observed that only BOPO significantly and negatively influenced ROA at the level of 0.000. This shows that during the period after the merger, greater operational efficiency was attained through a reduction in BOPO which significantly advanced the profitability of Bank Syariah Indonesia. On the other hand, the NPF, CAR, FDR and CIR as well as NPF ($p = 0.796$), CAR ($p = 0.142$), FDR ($p = 0.867$), and CIR ($p = 0.566$) showed no significant impact on ROA. This observation suggests that post-merger, the profitability of BSI was primarily determined by the bank's cost management capabilities as opposed to the financing risk, capital adequacy, financing disbursement, or revenue to efficiency ratio.

5. Conclusion

The conclusion showed that out of five financial ratios examined, only BOPO had a consistently negative impact on ROA during both periods, even though its coefficient value dropped from -0.112 pre merger to -0.079 post merger. This explains that operational effectiveness is still a crucial determinant of profitability for Bank Syariah Indonesia (BSI), however, its impact on profit reduced after the merger. On the other hand, NPF which had a strongly positive impact pre merger ($p = 0.036$) became negligibly impactful post merger ($p = 0.796$). This means that the merger altered the interaction between the profitability and the quality of financing. FDR also changed from significant to nonsignificant. CAR and CIR were both consistently insignificant during both periods.

The outcomes of the difference test based on the One-Sample Kolmogorov-Smirnov Test reveal that for both periods, the Asymp. Sig. (2-tailed) result is 0.000. This indicates there is a strong difference in the distribution of data across the studied variables. This supports the aim of the study to evaluate the changes in the impact of financial ratios on profitability in

the pre-and post-merger phase, reconfirming the assumption that the merger affects the relationship movement between the variables of financial performance.

This research gives practical insights to BSI management and Islamic banking policymakers in developing strategies for profit retention after mergers. Efforts to improve operational efficiency have proven to be a crucial determinant, thus managing operational expenses should be a focus. In addition, these findings contribute to literature on performance of Islamic banks after mergers, especially within the scope of Indonesian banking.

Regarding this study's limitations, the gaps identified stem from the single merged bank entity serving as the sample as well as the short duration of the study's observation period. Thus, it is suggested that future investigations broaden the scope of research to include other Islamic banks with longer observation periods while incorporating macroeconomic factors, including inflation and interest rates, to capture a more complete analysis.

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