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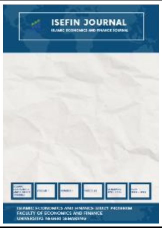

Measuring the Efficiency of Indonesian Sharia Banking with Stochastic Frontier Analysis: Pre-Merger and Post-Merger

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Abstract

This study examines the efficiency of Indonesian Sharia banking using Stochastic Frontier Analysis from 2019 to 2023, focusing on pre-merger and post-merger phases. This study uses a quantitative parametric approach with Stochastic Frontier Analysis. The input variables used are deposit funds (saving), assets, and administrative and general costs, while the output variables are the financing and other operating income. The analysis includes 16 Islamic Commercial Banks in the pre-merger period and 13 Islamic Commercial Banks in the Post-Merger Period. The results reveal a significant improvement in the efficiency of Sharia banks following the mergers. For Islamic Commercial Banks, the average efficiency score increased from 0.833 for financing and 0,733 for income in the pre-merger period (2019-2020) to 0.898 for financing and 0,8019 in the post-merger period (2022-2023). These findings indicate that the mergers have positively impacted the operational efficiency of Indonesian Sharia banks. This study provides valuable insights for policymakers, regulators, and financial institutions, highlighting the importance of strategic consolidations to enhance efficiency. The improvement in efficiency scores post-merger suggests that such consolidations enable better resource allocation, enhanced economies of scale, and improved management practices, thereby contributing to the overall stability and performance of Sharia banking in Indonesia.

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INTRODUCTION

The Indonesian banking sector has witnessed significant transformations, particularly with the rise of Islamic banking, which operates by Islamic law and is characterized by ethical banking practices (Wahab, 2015; Afandi, Suhel, & Syathiri, 2023). This sector has grown in response to increasing demand from Indonesia's predominantly Muslim population, mirroring a global trend in Islamic finance aimed at providing financial services that comply with Islamic ethical standards. Understanding the efficiency of these Islamic banks is crucial, as efficiency impacts profitability, competitiveness, and sustainability. For Islamic banking, which adhere to principles such as the prohibition of interest (*riba*) and speculative activities (*gharar*), efficiency analysis helps elucidate how healthy resources are utilized to generate income and manage risks within the constraints of Sharia law (Kusumo, & Karim, 2014).

The Islamic banking sector in Indonesia has been growing steadily, driven by the increasing demand for Islamic financial services (Utami, Risfandy, & Rolina, 2022). According to Miftah & Wibowo (2017); Hafez, & Halim (2019)Significant mergers have marked this growth to consolidate resources and enhance the sector's competitiveness. One of the most notable mergers was the amalgamation of Bank Syariah Mandiri, BNI Syariah, and BRI Syariah to form Bank Syariah Indonesia (BSI) in February 2021. This merger was a strategic move to create a more vital, efficient Islamic banking institution capable of competing domestically and internationally. Before the merger, the assets of Islamic banking in Indonesia were distributed among several smaller institutions (Susanti, 2021).

The presence of PT Bank Syariah Indonesia Tbk, which is trying to unite the advantages of the three existing state-owned Islamic banks, causes its services to be complete, its reach more comprehensive, and it is capital capacity better (PT Bank Syariah Indonesia, 2021). As proof, looking at the position of PT Bank Syariah Indonesia Tbk in the national and global banking industry as follows:

Table 1. Performance of Three State-Owned Islamic Banks and Merger Results

	BRIsyariah		mandiri syariah		BNI Syariah		BSI
Number of ATM	539 ATM		1.044 ATM		202 ATM		1.785 ATM
Number of branch offices	71 branch offices 232 sub-branch offices		68 branch offices 222 sub-branch offices		129 branch offices 398 sub-branch offices		1.120 branch offices
Number of employees	5.790 employees		5.692 employees		8.612 employees		20.094 employees
Number of customers	3,9 million customers		3 million customers		8 million customers		> 14,9million customers
(In Trillion Rupiah)	**2019**	**2020**	**2019**	**2020**	**2019**	**2020**	**December 2020**
Total assets	43,12	57,70	112,29	126,85	44,98	55,01	239,56
Financing	34,12	49,34	99,81	112,58	43,77	47,97	209,98
Third-party funds	27,38	40,00	75,54	83,43	32,68	33,05	156,51
Profit	0,074	0,25	1,28	14,3	0,6	0,5	2,19

Source: Kristiyana, (2021) processed

The increase in assets post-merger reflects the enhanced capacity of BSI to mobilize resources, streamline operations, and offer a broader range of products and services. The merger amplified the bank's financial strength and positioned it better to serve the growing market for Islamic banking in Indonesia. The consolidated entity can leverage economies of scale, reduce redundancies, and invest more effectively in technology and innovation (Syarifuddin, et al, 2021). Efficiency in banking is a crucial determinant of overall performance, influencing profitability, competitiveness, and sustainability. For Islamic banking sector, efficiency is critical due to their unique operational principles, which include prohibitions on interest (riba) and speculative activities (*gharar*). Measuring efficiency helps understand how well these banks utilize resources to generate income and manage risks while adhering to Sharia principles. Moreover, it provides insights into operational strengths and weaknesses, which are crucial for strategic planning and policy formulation.

However, despite the notable growth of the Islamic banking sector in Indonesia, academic studies specifically examining the technical efficiency of Islamic banks before and after mergers remain limited. Most previous research has focused on descriptive analyses of financial performance indicators such as Return on Assets (ROA), Financing to Deposit Ratio (FDR), or Sharia compliance, but has not quantitatively assessed the impact of consolidation on operational efficiency. For instance, studies by Kusumo and Karim (2014) and

Hafez, & Halim (2019) did not employ advanced econometric techniques such as Stochastic Frontier Analysis (SFA) to evaluate efficiency in the context of Islamic bank mergers. Yet, the merger of Bank Syariah Mandiri, BNI Syariah, and BRI Syariah into Bank Syariah Indonesia (BSI) marks a significant milestone in the transformation of the national Islamic banking system that warrants in-depth investigation.

The novelty of this research lies in the application of Stochastic Frontier Analysis (SFA) to comprehensively measure the technical efficiency of Islamic banks before and after the merger. This study also explores the determinants influencing changes in efficiency, which have been largely overlooked in previous literature, and offers strategic policy implications aimed at enhancing the competitiveness and sustainability of the Islamic banking sector. In addition to contributing academically to the limited body of literature on Islamic banking efficiency in Indonesia, this research provides practical insights for regulators, policymakers, and bank management in evaluating and planning long-term strategies.

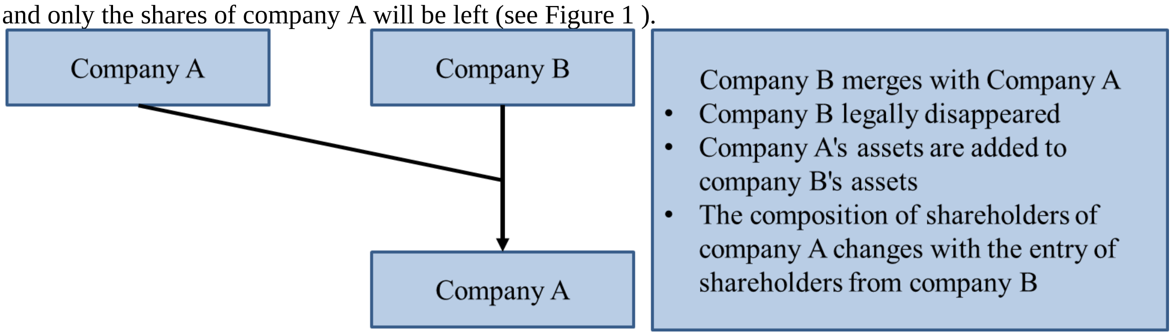
The focus on pre-merger and post-merger efficiency is relevant due to the recent consolidation trend within the Islamic banking sector in Indonesia. Mergers are often pursued to achieve economies of scale, improve competitive positioning, and enhance financial stability. However, the actual impact of these mergers on efficiency needs thorough examination. This study aims to assess whether mergers have led to improved efficiency in Indonesian Islamic banking. This study's primary objectives are to measure Indonesian Islamic banking' efficiency pre- and post-merger using Stochastic Frontier Analysis, identify critical factors influencing efficiency changes during these phases, and provide policy recommendations based on the findings to enhance the sector's efficiency. This research is significant as it addresses the limited literature on the efficiency of Islamic banking in Indonesia, especially in the context of mergers.

Based on the background described previously, the following research questions were formulated: (1) What is the technical efficiency value of Islamic banks pre and post-merger? (2) What are the operations of Islamic banks pre and post-merger? (3) What are the determinants of the technical efficiency values of Slamic banks pre and post-merger? The insights gained can guide bank management and policymakers in improving the performance of Islamic banks and serve as a benchmark for similar banking environments globally. By offering a detailed analysis of the efficiency of Indonesian Islamic banks using Stochastic Frontier Analysis, this study aims to provide valuable implications for enhancing their operational efficiency and strategic direction.

Business Merger Concept

The mechanism for company development or expansion can carry out in two ways, namely (Nizar & Nasir, 2020): (1) internal expansion, company development carried out without involving other agencies outside the company, for example establishing new agents or branch offices; (2) external expansion, the development of the company by involving organizations outside the company, for example, the merger of business entities. One of the efforts that can be made related to business combinations involving outside parties is the merger process.

According to Brealey, Myers, & Marcus (2011), a merger is an effort to combine business entities into one by taking over or buying all the assets and liabilities of the merged company. So that in practice the merger process, the company taking over owns at least 50 percent of the shares while the company taking over ceases to operate, and its shareholders receive cash or shares in the new company (Ross et al., 2012). For example, a merger between company A and company B. The shareholders of company B agree that each of their shares will replace with two shares of company A. Then after the merger process company, B's shares will be lost, and only the shares of company A will be left (see Figure 1).



Source: Tarigan, Yenawan, & Natalia (2016)

Figure 1. Company Merger Scheme

In the merger process, it becomes a strategy for a company carried out by two or more companies, where there is a company that takes over, and there is a company that is taking over. Several considerations lead to a merger of two or more companies, including:

Table 2. Company Motives for Merging

Motive	Information
Business diversification	Companies desire a fast growth rate in size, stock market, and business diversification rather than building their business unit.
Economies of scale	There is a desire to get economies of scale from the company's operational efficiency so that the company will get a cost advantage as the average cost per unit decreases because the level of total output increases.
Big income	There is a desire to get more significant income from better marketing activities, strategic benefits, and increasing company competitiveness.
Liquidity	There is a desire to increase the company's liquidity because the more significant the company, the easier it will be to access the stock market, and shares will be easier to obtain
Managerial and technological skills	There is a desire to improve managerial skills and technology applied to the company to increase efficiency in its management.

Sources: Devos, Kadapakkam, & Krishnamurthy (2009); Ross et al, (2012); Kowalik, et al, (2015).

Islamic Banking Practice

Defines Islamic banking as a financial service institution that carries out the business of collecting funds from the public and distributing it to the public in the form of financing or loans as well as other economic activities in the form of services based on applicable sharia principles (Supriyadi, 2017). Understanding how to comprehensive Islamic banks in three ways, including:

Table 3. Definition of Islamic Bank

Category	Explanation
Regulation legislation	Based on Law No. 21 of 2008 concerning Islamic Banking, a Islamic bank is a business entity that collects public funds in savings and distributes them to the community to improve the people's standard of living.
Services offered to consumers	Based on the products offered to consumers, banks are institutions that accept money deposits, distribute them to the public, and provide other services.
Economical function	Based on the economic function, Islamic banking is a financial service institution that accepts money deposits and distributes them to businesses for economic activities and other services.

Source: Macey & Miller, (1997)

According to the Otoritas Jasa Keuangan (2020), the philosophical basis for the presence of Islamic banking is to meet the demand for the availability of financial services by Sharia principles that avoid the practice of usury, *maysir*, and *gharar*. On the material and spiritual aspects and the fulfillment of basic human needs (*maslahat*).

So Islamic banking continues to transform to increase competitiveness and contribute more significantly to the economy and development in Indonesia. Islamic banking applies the fundamental essence of maqasid sharia in carrying out financial services and financial intermediation based on applicable sharia principles.

The Concept Of Efficiency In Sharia Banking

The efficiency of Sharia banking has been a topic of considerable interest among researchers, particularly as Islamic finance gains prominence globally. Efficiency is vital for banks as it directly impacts their profitability and competitiveness. Efficient banks can offer better services at lower costs, attract more customers, and achieve sustainable growth. Moreover, efficiency improvements can lead to enhanced stability in the financial system, as efficient banks are better equipped to manage risks and adapt to market changes.

Numerous studies have explored the operational efficiency of Sharia banks, often comparing them to their conventional counterparts. Research by Molyneux, & Iqbal, (1988) indicates that Sharia banks, while adhering to distinct principles such as the prohibition of interest and speculative transactions, can achieve comparable levels of efficiency to conventional banks. The efficiency of Sharia banking, evaluated through Stochastic Frontier Analysis (SFA), has been extensively studied, revealing nuanced insights into the operational performance of Islamic financial institutions. SFA is parametric method estimates efficiency by separating random errors from inefficiencies. SFA constructs a frontier based on a statistical model, allowing for the measurement of deviations from this frontier due to inefficiency. SFA is particularly advantageous in this context as it differentiates between inefficiencies and random errors, thus providing a precise measure of a bank's efficiency.

According to Archer (2010), efficiency is a measure of effectiveness that minimizes wasted time, energy, and skills. This aligns with Silkman (1986), who defines efficiency as completing work correctly. From a mathematical point of view, this means calculating the ratio of output and input, or in other words, showing the amount of output produced from the input required. Like what companies do in general, this efficiency calculation can also be applied in banking, especially BPRS, as a benchmark for its performance.

Calculating efficiency in Islamic banks requires input-output variables that consider the nature and characteristics of the research object to be analyzed. According to Puteh, Rasyidin, & Mawaddah (2018); Mai, et al. (2023), the concept used to define the relationship between input and output in financial behavior can be done using two methods (parametric and non-parametric methods) and three approaches (Production approach, intermediation approach, and Asset approach). Using different methods and approaches will result in different efficiency calculations. The use of appropriate methods and approaches in calculating the efficiency of Islamic banks is to use non-parametric methods and an intermediation approach with the consideration that Islamic banks are financial intermediation institutions (Berger & Humphrey, 1997)

METHOD

Data Types And Sources

Population and the sample used consists of lslamic Commercial Banks in lndonesia, by comparing 16 Islamic Commercial Banks before the merger in 2019 and after the merger as many as 13 in 2021 using quarterly financial reports. This study uses a purposive sampling technique, based on the completeness of the data used in the test, the sample obtained was 104 banking data. The data is a type of secondary data form annual reports and banking financial reports for 2019 and 2023. Microsoft Excel 2013 and Front-41are used in this study to measure the leve1 of efficiency with the Stochastic Frontier Analysis approach. There are 16 Sharia Commercial Banks listed in the Financial Services Authority, sharia banking statistics in 2019, and reduced in 2021 to 13 Sharia Commercial Banks due to the merger of three sharia banks into Bank Syariah Indonesia (BSI).

Table 4. Islamic Commercial Banks in Indonesia, 2019 - 2023

No	Bank	Year
1	PT. Bank Aceh Syariah	2004 - now
2	PT BPD Riau Kepri Syariah	2002 - now
3	PT BPD Nusa Tenggara Barat Syariah	1964 - now
4	PT. Bank Muamalat Indonesia	1991 - now
5	PT. Bank Victoria Syariah, Tbk	2010 - now
6	PT. Jabar Banten Syariah	2000 – now
7	PT Bank Syariah Indonesia, Tbk	2021 – now
8	PT. Bank Mega Syariah, Tbk	2004 – now
9	PT. Bank Panin Dubai Syariah, Tbk	2009 – now
10	PT Bank KB Bukopin Syariah	2008 – now
11	PT. BCA Syariah, Tbk	2010 - now
12	PT. Bank Tabungan Pensiunan Nasional, Tbk	1958 - now
13	PT. Bank Aladin Syariah, Tbk	2010 - now
14	PT. BRI Syariah, Tbk	2008 - 2021
15	PT BNI Syariah, Tbk	2010 - 2021
16	PT. Mandiri Syariah, Tbk	1999 – 2021

Research Approach

Meanwhile, to measure efficiency using Stochastic Frontier Analysis approach, according to the research objective, namely measuring the efficiency level of Islamic Commercial Banks using the Stochastic Frontier Analysis method, this study uses input and output variables in the calculation. The identification of input-output variables used in this study uses an intermediation approach. Looking at previous research that has been carried out and by making adjustments that are considered to provide results that are expected to be able to explain the efficiency of the Islamic Bank, a research model is formed as follows (Tahir, Bakar, & Haron, 2008; Bhattacharyya dan Pal, 2011; Garcia, 2012):

$$\ln (Fin)_{it} = \propto + \beta_1 \ln (DF)_{it} + \beta_2 \ln (Ast)_{it} + \beta_3 \ln (AGC)_{it} + \varepsilon_t$$

$$\ln (Inc)_{it} = \propto + \beta_1 \ln (DF)_{it} + \beta_2 \ln (Ast)_{it} + \beta_3 \ln (AGC)_{it} + \varepsilon_t$$

Therefore, the estimated SFA model consisting of 3 inputs (I) and 2 outputs (O) is as follows:

Table 5. The Estimated SFA Model

Variables	Definition	Dimensions
Input Variables	The input variable is an input variable that functions to determine what proportion or percentage is needed to achieve a balanced condition between needs and expectations so that efficiency is achieved.	• Deposit funds (saving) • Assets are al1 rights that can be used in the company's operations. • Administrative and general costs are costs incurred to carry out business activities.
Output Variables	Output variable is the output variable which is the result of a process of an economic activity unit	• Financing means the product of Islamic bank fund distribution to the public, both individuals and legal entities with muamalah contracts. • Other operating income is income resulting from operational activities of Islamic banks.

Urgency Of Research

This study is significant for several reasons. First, it contributes to the limited body of literature on the efficiency of Islamic banking in Indonesia, particularly in the context of mergers . Second, it offers practical insights for bank management and policymakers aiming to improve the performance of Sharia banks. Finally, the findings can serve as a benchmark for other countries with similar banking environments, thus enhancing the global understanding of Sharia banking efficiency. In summary, this study aims to bridge the gap in existing literature by providing a detailed analysis of the efficiency of Indonesian Sharia banks before and after mergers using Stochastic Frontier Analysis. The results are expected to offer valuable implications for improving operational efficiency and strategic direction of Sharia banks in Indonesia.

Results and Discussion

Efficiency Level of lslamic Commercial Banks in lndonesia Pre-Merger and Post-Merger

This efficiency value shows how well each bank manages its resources to produce output. The closer the value is to 1, the more efficient the bank is. This data can be used to further analyze each bank's performance over time. The efficiency level in this study was obtained using the Front-41 Software and the average efficiency level was obtained as follows:

Table 6. Efficiency Level of lslamic Commercial Banks in lndonesia Pre-Merger and Post-Merger

Bank	2019		2020		2021		2022		2023		Average	
	Fin	Inc	Fin	Inc	Fin	Inc	Fin	Inc	Fin	Inc	Fin	Inc
Bank 1	0.85	0.75	0.88	0.78	0.90	0.80	0.92	0.82	0.93	0.83	**0.86**	**0.79**
Bank 2	0.82	0.72	0.85	0.75	0.87	0.77	0.89	0.79	0.90	0.80	**0.90**	**0.76**
Bank 3	0.87	0.77	0.89	0.79	0.91	0.82	0.93	0.84	0.94	0.85	**0.84**	**0.81**
Bank 4	0.80	0.70	0.82	0.72	0.85	0.75	0.87	0.77	0.88	0.78	**0.83**	**0.74**
Bank 5	0.78	0.68	0.81	0.71	0.84	0.74	0.86	0.76	0.87	0.77	**0.88**	**0.73**
Bank 6	0.83	0.73	0.87	0.77	0.89	0.79	0.91	0.81	0.92	0.82	**0.87**	**0.78**
Bank 7	-	-	-	-	0.86	0.76	0.88	0.78	0.89	0.79	**0.86**	**0.75**
Bank 8	0.81	0.71	0.84	0.74	0.88	0.77	0.90	0.79	0.91	0.80	**0.88**	**0.76**
Bank 9	0.84	0.74	0.86	0.76	0.89	0.79	0.91	0.81	0.92	0.82	**0.82**	**0.78**
Bank 10	0.77	0.67	0.80	0.70	0.83	0.73	0.85	0.75	0.86	0.76	**0.89**	**0.72**
Bank 11	0.86	0.76	0.88	0.78	0.90	0.81	0.92	0.83	0.93	0.84	**0.88**	**0.80**
Bank 12	0.85	0.75	0.86	0.77	0.88	0.80	0.90	0.82	0.91	0.83	**0.85**	**0.79**
Bank 13	0.82	0.72	0.84	0.74	0.86	0.77	0.88	0.79	0.89	0.80	**0.81**	**0.76**
Bank 14	0.80	0.70	0.82	0.72	-	-	-	-	-	-	**0.81**	**0.74**
Bank 15	0.79	0.69	0.83	0.73	-	-	-	-	-	-	**0.83**	**0.75**
Bank 16	0.81	0.71	0.85	0.75	-	-	-	-	-	-	**0.86**	**0.77**
Average	**0.82**	**0,71**	**0.84**	**0.74**	**0.87**	**0.77**	**0.89**	**0.82**	**0.90**	**0,79**	**0.86**	**0.76**

Based on the calculation of the efficiency leve1 using Stochastic Frontier Analysis in table 4, the average Islamic Commercial Bank in Indonesia has an efficiency level of 83,19% in the pre-merger (2019-2020), while in the post-merger period, it increased by 6.56% to 89,75%. This indicates that, on average, the banks became more efficient post-merger. To understand the specifics, a deeper analysis could involve: (1) examining individual bank performances pre- and post-merger; (2) analyzing specific areas of improvement such as cost management, revenue generation, and service delivery; and (3) comparing with industry benchmarks and other banks not involved in the merger.

Detailed Bank-Wise Averages

The analysis of efficiency for 16 Islamic commercial banks in Indonesia between 2019 and 2023 reveals a significant improvement in efficiency post-merger compared to the pre-merger period. Here is a detailed look at the average efficiencies of each bank pre-merger and post-merger:

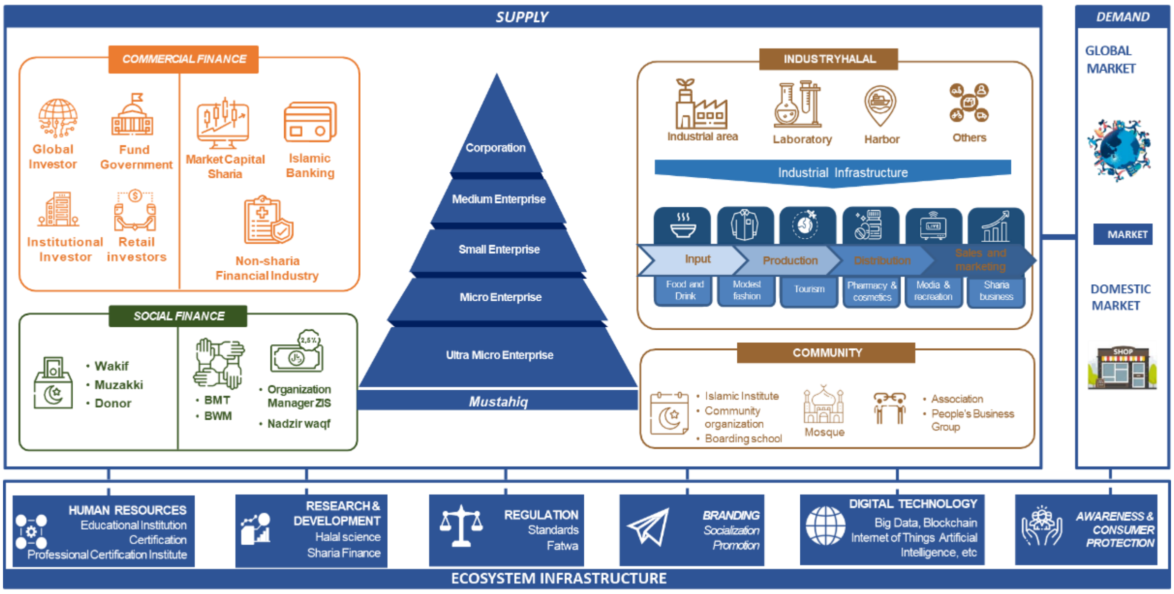
Table 7. Comparison of Average Values of Efficiency Level of Islamic Commercial Banks in Indonesia Pre-Merger and Post-Merger

Bank	Pre-Merger Avg		Post-Merger Avg	
	Fin	Inc	Fin	Inc
Bank 1	0.8650	0,765	0.9250	0,8250
Bank 2	0.8350	0,735	0.8950	0,7950
Bank 3	0.8800	0,78	0.9350	0,8450
Bank 4	0.8100	0,71	0.8750	0,7750
Bank 5	0.7950	0,695	0.8650	0,7650
Bank 6	0.8500	0,75	0.9150	0,8150
Bank 7	-	-	0.8850	0,7850
Bank 8	0.8250	0,725	0.9050	0,7950
Bank 9	0.8500	0,75	0.9150	0,8150
Bank 10	0.7850	0,685	0.8550	0,7550
Bank 11	0.8700	0,77	0.9250	0,8350
Bank 12	0.8550	0,76	0.9050	0,8250
Bank 13	0.8300	0,73	0.8850	0,7950
Bank 14	0.8100	0,71	-	-
Bank 15	0.8100	0,71	-	-
Bank 16	0.8300	0,73	-	-

The data shows a consistent improvement in efficiency for all the banks post-merger, supporting the overall positive impact of the merger on the efficiency of Islamic commercial banks in Indonesia. Potential factors for increasing the efficiency of Islamic commercial banks are as follows (silkman, 1986): (1) economies of scale: the merger might have allowed the banks to benefit from economies of scale, reducing operational costs and improving efficiency; (2) enhanced capabilities: mergers can bring together the best practices, technologies, and expertise from the merging entities, leading to overall better performance; (3) market position: a stronger combined entity may have a better market position, allowing it to leverage better terms and more opportunities.

Challenges and Opportunities of the Islamic Banking Merger Process

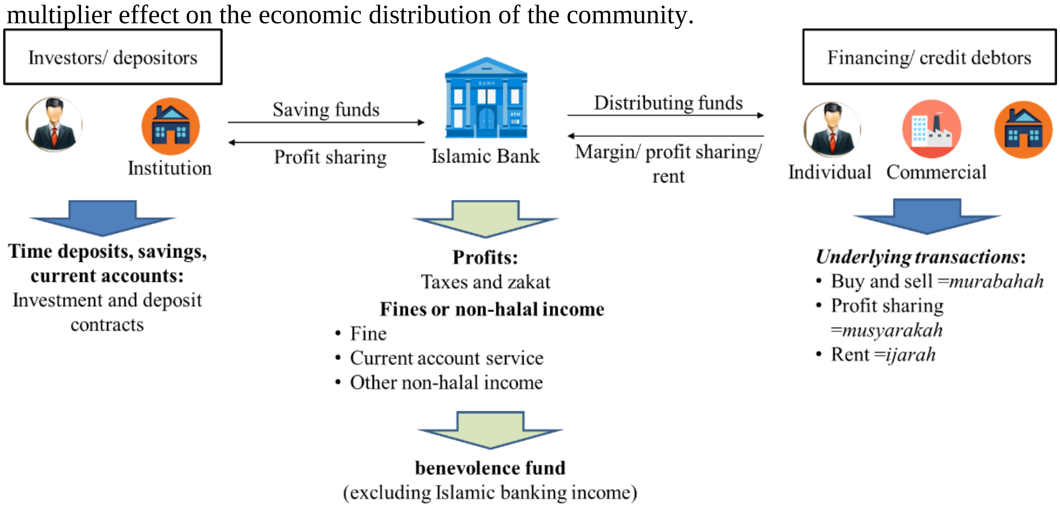
Efforts to strengthen Islamic banks in the national economy align with the Indonesian Banking Development Roadmap, 2020-2025. It is evidence by the existence of an Indonesian Islamic financial and economic ecosystem design which is the outline in realizing Islamic banking that is highly competitive and able to contribute to the national economy and social development (see Figure 2). Harmonization of the Islamic economic and financial ecosystem, both from the demand and supply side, will depend on the supporting tools, including (Otoritas Jasa Keuangan, 2020): (1) human resources; (2) research and development; (3) regulation; (4) branding; digital technology; (5) consumer protection. The hope is that it can increase the competitiveness of Islamic banks in the global market and become a catalyst for Islamic economic growth in Indonesia (Alhusain, 2021).



Source:Wibowo, (2022), modified

Figure 2. Design of Indonesia's Islamic Economic and Financial Ecosystem

Islamic banking has a significant role in the economic and financial ecosystem of Islamic finance as an intermediary financial institution. Because in practice, Islamic banking has a different concept that can optimize distributing the economy of the people through its intermediation function, through the distribution of taxes, zakat, and benevolence funds (see Figure 3). Through this intermediation function, Islamic banks can provide a multiplier effect on the economic distribution of the community.



Source: Suhendra & Ronaldo (2017) modified

Figure 3. Financial Intermediation Mechanism in Islamic Banking

According to the Otoritas Jasa Keuangan, (2020), the transformation of Islamic banking needs to impact its socio-economic aspects and the competitive advantage possessed by Islamic banking. One form of transformation carried out by Islamic banking is through a merger process that will strengthen the institutions of the Islamic finance industry. So that, in the end, it can increase Indonesia's participation in the global Islamic economy and finance (Alhusain, 2021). Therefore, the creation of a new identity in Indonesian banking after the merger process is as follows:

Table 8. Transformation of Islamic Banking

The Old Identity Of Islamic Banking	The New Identity Of Islamic Banking
Not yet have significant business model or product differentiation	Have a unique business model and products offered

Low literacy and inclusion index	Optimizing the Islamic economy and finance ecosystem
The quantity and quality of human resources that are less than optimal	Integrating commercial and social finance functions
Insufficient IT	Improving the ability of qualified human resources
	Leveraging up-to-date IT

Source: Otoritas Jasa Keuangan, (2020)

One of the considerations made by this merger is that the penetration of Islamic banking is relatively lagging behind conventional banking or with Islamic banking in other countries. Even though the Covid-19 pandemic has weakened the global economy, including Indonesia, Islamic banking continues to show a positive and resilient trend. Thus, to optimize the Islamic banking merger process, it is necessary to consider the current opportunities and challenges (see Table 9).

Table 9. Opportunities and Challenges of the Merger Process for Islamic Banking in Indonesia

Opportunity	Challenge
Efficiency improvement and consolidation processes that support competitiveness	Requires a process of value and cultural adaptation
Increase capital so that you can access larger transactions and financing	Requires harmonization of governance that has been formed in each Islamic bank to be combined better
Increase opportunities for Islamic banks to participate in and finance national development projects	Mapping of existing products and services that are useful in the process of customer migration from the original bank to the merged bank
Encouraging the presence of large-scale Islamic banks that compete in national and global markets	Increasing competitive products and services in the retail, SME, and corporate sectors (including digital banking services)
Increasing Islamic financial literacy and inclusion	Increase in total owned capital, from book bank III to book bank IV
Fulfillment of financing needs, transactional banking and trade finance (especially in the halal industry)	Encouraging an economic and Islamic finance ecosystem that can support and complete the fulfillment of the needs of customers, institutions, and corporations

Source: Gunardi, (2021), modified

With the challenges of Islamic banking in the future, an appropriate strategy is prepared for the times. According to Kristiyana (2021), in order to show a positive and resilient trend in Islamic banking, the following measures were taken: (1) strengthening the identity of Islamic banking; (2) sharia ecosystem synergy; (3) strengthening of licensing, regulation and supervision. It is confirmed by Gunardi, (2021) that three crucial points will be implemented in PT Bank Syariah Indonesia Tbk, which is the result of the merger of existing Islamic banking, namely:

Table 10. Strategy of Islamic Banking in Responding to Future Challenges

Strategy	Information
Growing the MSME segment in an integrated ecosystem and value chain	• Serving the specific needs of MSME clients related to Islamic banking • Carry out government mandates related to superior micro-segmentation • Building MSME centers in provinces and cities/districts • Integrating ecosystems and value chains in the MSME sector • Provide a training center and assistance for MSME products (offline or online)
Serving the retail segment with sharia-specific services	• Providing the best banking experience in digital banking, service, and product quality (payroll business, consumer finance, pawn gold) • Development of an Islamic ecosystem typical of sharia (hajj and umrah, Zakat, Infaq, Alm, Waqf funds, community organizations, education, health)
Wholesale segment development with innovative products, including global business development	• Medium-scale financing syndication and synergizing with other BUS • Encouraging Islamic wholesale product innovation by optimizing sharia-specific contracts • Become a means for foreign investors to be able to access the domestic infrastructure market and investment

Source: Gunardi, (2021), modified

The success of this merger process depends on the seriousness of the stakeholders involved. According to the (Otoritas Jasa Keuangan, 2020), four things can support a successful merger, namely: (1) leadership and change management; (2) the quality and quantity of human resources; (3) information technology infrastructure; and (4) synergy and collaboration of all stakeholders (see Table 11). In order to increase the competitiveness of Islamic banks in the global market and become a catalyst for Islamic economic growth in Indonesia.

Table 11. Synergy of Islamic Banking Stakeholders

Stakeholders	Information	Perpetrator
Government	Synergy through policies that support the development of the Islamic banking industry and its ecosystem (halal industry)	• Ministry of Finance • Ministry of SOEs
Regulator	Cooperating in increasing Islamic financial literacy and inclusion through joint programs	• Bank Indonesia • Financial Services Authority • National Sharia Finance Committee • National Sharia Council - Indonesian Ulema Council
Islamic Community Organizations	Cooperating in conducting massive socialization to increase Islamic financial literacy and inclusion to the community	• Muhammadiyah • Nahdatul Ulama
Association	Active synergy through forums, discussions, and research to develop Islamic banking products and services needed by customers	• Sharia Economic Community • Indonesian Islamic Bank Association • Government Bank Association
Public	Increase trust to conduct transactions in Islamic banking and improving Islamic financial literacy and inclusion	Customer

Source: Gunardi, (2021), modified

If viewed from a sharia compliance perspective, the impact of sharia mergers in Indonesia does not have significant changes. In fulfilling the principles of Maqsid Sharia, there is little difference, as found by Mardini et al. (2022), which shows that the Maqashid Sharia Index in Sharia banking before and after the merger has the same value. Apart from that, if we look at institutional governance, the Sharia Supervisory Board at Bank Syariah Indonesia is the former Sharia Supervisory Board from BNI Syariah, Bank Syariah Mandiri, and BRI Syariah. So, the fulfillment of sharia principles and compliance after the merger will be similar to before.

Assessment of Islamic Banking Merger with Five Forces Model and SWOT Analysis

The merger of Islamic commercial banks in Indonesia has led to notable improvements in efficiency, benefiting the banks through cost savings, enhanced capabilities, and better market positioning. These improvements suggest that strategic mergers, supported by regulatory frameworks, can significantly contribute to the overall health and competitiveness of the banking sector. Future strategies should continue to leverage these efficiencies for sustained growth and customer satisfaction.

To describe the competitive map of Islamic banking, we can use the five force model created by (Porter, 1979), where this model will describe and develop the strategy of Islamic banking to shape the structure of the banking industry both nationally and globally so that the purpose of this approach can carrying out by Islamic banking in national and even global competition (Kodrat, 2019).

Table 12. Assessment of the Islamic Bank Merger Process through the Five Forces Model

Indicator	Definition	Information
New Entrants	The threat of entry of new entrants into an industry. The presence of new entrants with new capacities and the desire to seize market share (Hussain, Khatoon, & Sarwar, 2019). There are six primary sources of barriers to entry into an industry: 1. economies of scale, 2. product differentiation, 3. capital requirement, 4. cost of switching suppliers, 5. access to distribution channels, and 6. unfavorable costs, regardless of scale.	**Moderate or moderate**. The relatively high initial capital influences this for establishing a new bank, IDR 1 billion for Islamic banks (PBI No. 11/3/PBI/2009 concerning Islamic Commercial Banks) and IDR 3 billion for conventional banks (PBI No. 11/1/ PBI/2009 concerning Commercial Banks). In addition, the provision of infrastructure (HR, technology) that supports banking operations is one of the obstacles to the arrival of new entrants.
Bargaining Power of Customers	The strength of each buyer is an essential aspect of the industry (Rachdi, & Mokni, 2014). Where are the four situations that favor buyers in having market bargaining power: 1. centralized buyer group 2. products purchased from the industry are part of the cost 3. quality of purchased product 4. complete information	**Moderate or moderate.** In general, customers from Islamic banking comprise only a few segments, most of which are permanent employees of the private sector and state civil servants who carry out consumptive financing by paying off salary deductions, in contrast to productive financing in the corporate sector with relatively high bargaining power. Therefore, Islamic banking needs to prepare

		various kinds of bargaining power from all existing customers.
Bargaining Power of Suppliers	The bargaining power of each supplier will threaten companies that have been getting input from suppliers (Syamlan, Wahyuni, & Sudiharto, 2023). So that the company's dependence on suppliers is getting more significant from time to time. It is done by increasing or decreasing the quality of the product to be purchased. Several factors give suppliers power: 1. the supplier does not face other substitutes for the product sold 2. the industry is not the critical customer 3. the supplier's product is an essential input 4. differentiated supplier group products	**High enough.** Suppliers are the providers of various sources of funds and services, especially the owners of funds (third-party funds or non-third-party funds). In particular, industrial and large corporate customers generally ask for a special rate to be willing to place their funds in Islamic banks, which will cause the fund structure in Islamic banks to become less than ideal and will have an impact on the high cost of funds. Therefore, a portfolio of increased funding will increase the bargaining power of suppliers.
Substitutes	All firms in the existing industry compete in a broad sense by producing substitute products. This substitute product limits the potential profit of the industry by setting a ceiling price that companies in the industry can provide (Mehjabeen, 2018; Komite Nasional Keuangan Syariah, 2019). The more attractive the alternative prices offered by substitute products, the tighter the restrictions on industry profits. Where the focus is on: 1. products that tend to have a better price or performance than industrial products 2. products produced by the industry generate high profits for the company	**High enough.** One of the threats is substitute products from Islamic financial institutions that can offer lower fees or easier, simpler, and easier processes, and it can be an easy switching process that can severely threaten Islamic banking. Institutions that have the potential to become substitutes for Islamic banking include conventional state-owned banks, BPR or BPRS services, savings and loan cooperatives, multi-finance consumer financing institutions, and technology-based financial services that take advantage of network and service advantages.
Existing competitors	Rivalry among existing competitors takes the form of a race for a position using various tactics (Ghozali, Kamri, & Khafid, 2022). Five factors lead to rivalry among existing competitors: 1. number of competitors 2. differentiation 3. capacity addition 4. diverse competitors 5. exit barrier	**Very high.** Competition conditions in the Islamic banking industry are relatively tight because the leading players from BUS, UUS, and BPRS compete strictly in business related to the existing Islamic banking market share. Large capitalization and a vast network of sharia offices or services are indicators of sharia banking competition.

Based on the results of the Five Forces Model, which falls into the medium to a very high category, it becomes a severe threat to Islamic banking. Therefore, to strengthen the strength in creating a Islamic banking strategy based on the merger process, one can respond through (Kementerian Perencanaan Pembangunan Nasional, 2019): (1) product differentiation and innovation (strengthening the existing customesr base by diversifying products that highlight the unique principles and values sharia to potential segments that have not been optimize so far); (2) orientation on service quality (network development and services to customers who prioritize ease of access and the best service); (3) Institutional strengthening (capital strengthening and governance system by the prevailing good corporate governance); (4) focus on business development (business development capable of serving dynamic customers needs to be supported by modern and competent information technology and resources).

In addition, a SWOT analysis is carried out to produce a comprehensive and in-depth study related to the effectiveness of the merger process carried out by Islamic banking, considering the relatively good potential such as rapid development, potential customers, extensive services, literacy levels, and good Islamic financial inclusion (David, 2006). It is the basis so that the existence of large-scale Islamic banks can be evaluated and described in the form of a SWOT analysis, as follows:

Table 13. SWOT Analysis on the Practice of Mergers in Islamic Banking

Strength	Weaknesses
• The source of funding comes from the Muslim community, loyal to sharia, and non-Muslims who believe in the sharia system.	• Funding dominating by high-cost and short-term deposits, so they cannot be channeled into long-term and expensive financing.
• The abundance of large enough hajj deposit funds and allocations from BPKH	• In terms of quality and inadequate human resources

• Clear regulations in various operational activities from the Ministry of Finance, Ministry of SOEs, Bank Indonesia, Financial Services Authority, National Sharia Finance Committee, National Sharia Council - Indonesian Ulema Council • The performance of Islamic banking (ROA, ROE, BOPO, NPF NOM) is relatively good. • Utilizing the available network in Islamic banking so that operational costs can be reduced and have the potential to increase profits	• The effect of the spin-off policy requires capital and business expansion with high investment. • The quality of human resources in financing risk management and financing analysis is still inexperienced. • We have not been able to allocate financing optimally due to limited capital and CAR regulations
Opportunities	**Threats**
• Halal industry development • MSME Development • The potential for people who do not have a Islamic banking account is relatively high • Government support to develop the sharia economy through sharia banking • Market share is still low, so there is still potential for unrealized financing • Digital banking is used to improve the quality of Islamic banking, which can make it easier for customers • Other social funds that have not been fully managed through Islamic banks	• The robust existence of conventional banks and other financial institutions to attract large-scale consumers • The quality and quantity of human resources who understand the principles and values of sharia for Islamic banking operations are still low • Difficult capital increases • Low economies of scale • The information technology system owned is still not as sophisticated as other financial institutions. • Banking education and literacy can still be optimized. • The digital economy is a threat to Islamic banks to increase retail financing.

Source: Komite Nasional Keuangan Syariah, (2019), modified

The Islamic banking development strategy can be carried out with schemes such as zero intervention or business as usual, with growth projections referring to historical industry data in previous years, such as moderate or aggressive full intervention. Financial inclusion programs that regulators and financial institutions intensively implement can be one of the keys to the success of PT Bank Syariah Indonesia in competing in the industry and attracting market share to switch to sharia programs.One of the tactics that PT Bank Syariah Indonesia can utilize is a top-down approach to increase market share significantly by 10-15% (Miftah, 2020). In addition, this approach should aim to increase the market share of Islamic banking and encourage the banking system as a whole.

CONCLUSION AND RECOMMENDATION

The findings of this study reveal a notable improvement in the operational efficiency of Indonesian Sharia banking following the merger of major Islamic Commercial Banks. Using Stochastic Frontier Analysis (SFA), the study evaluated the performance of 16 Islamic banks during the pre-merger period (2019–2020) and 13 Islamic banks in the post-merger period (2022–2023). The average efficiency score for financing increased from 0.833 to 0.898, while the score for income improved from 0.733 to 0.8019. These results indicate that mergers have facilitated more efficient resource utilization, improved financial performance, and streamlined operations within the Islamic banking sector.

This improvement in efficiency reflects the benefits of consolidation, including enhanced economies of scale, better asset management, and unified operational strategies. The merger of Bank Syariah Mandiri, BNI Syariah, and BRI Syariah into Bank Syariah Indonesia (BSI) exemplifies how strategic integration can transform fragmented financial institutions into a more competitive and stable entity. Furthermore, the findings underscore the importance of aligning merger processes with long-term efficiency goals, ensuring that growth is supported by sound financial and managerial practices in accordance with Sharia principles.

Based on the positive outcomes observed, this study recommends that policymakers and regulators continue to encourage well-structured mergers within the Islamic banking industry. Banks undertaking consolidation should prioritize effective post-merger integration, including harmonized IT systems, standardized governance, and human capital development. In addition, the implementation of efficiency monitoring tools like SFA should be institutionalized to guide ongoing improvements. Finally, investment in digital transformation and supportive policy incentives will be essential to sustaining the gains achieved and enhancing the role of Islamic banking in Indonesia’s broader financial system.

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