

Efficiency of Islamic Banks in Indonesia: Service Coverage, Business Size, Financing and Profitability During a Pandemic

Efi Syarifudin

Universitas Islam Negeri Sultan Maulana Hasanuddin Banten, Indonesia
efi.syarifudin@uinbanten.ac.id

Anggita Nurcahyani

Universitas Islam Negeri Sultan Maulana Hasanuddin Banten, Indonesia
anggita@uinbanten.ac.id

Nani

Universitas Islam Negeri Sultan Maulana Hasanuddin Banten, Indonesia
nnani4560@gmail.com

Abstract

Earlier studies on banking efficiency during the COVID-19 period have not considered the issue of service coverage due to work restrictions through PPKM and the trend of digitizing services. This study aims to map the efficiency of Islamic banks during a pandemic from a production perspective by utilizing labor, the number of offices, and equity as input variables. The output variable represents the bank's ability to generate total financing and operating income. The efficiency analysis in this study uses a Variable Return to Scale (VRS) approach by using secondary data in the form of financial reports and annual reports of 14 Islamic commercial banks registered with the Financial Services Authority (OJK) in the 2019-2021 period. The findings in the study are that, in general, most Islamic banks can maintain their productivity and efficiency during the pandemic. There was a decline in efficiency in 2020 but improved again in 2021. Islamic banks with the most service coverage and large business sizes, such as BSI (BNIS, BRIS, BSM) and BTPNS were able to keep their efficiency. Surprisingly, BMI maintained efficiency in 2019-2020 but experienced a significant decline in 2021. The practical implication of this research is that most Islamic banks can keep their performance during pandemics driven by various macroprudential policies and digital adaptation. Furthermore, it is recommended that the direction of efficiency projection is from the input side, such as employee reduction.

Keywords: Efficiency; Data Envelopment Analysis; Profitability; Service Coverage

INTRODUCTION

The crisis of 1998 and 2008 had an impact on the Indonesian banking sector. The financial industry initiated the causes of the economic crisis in the previous two decades. It differed from the current situation caused by a COVID-19 pandemic that affected the financial sector. The existence of a policy restricting space and community movement (PPKM) hinders the direction of the economic ecosystem. The industrial sector cannot perform its production activities optimally. Many industrial sectors have terminated employment (PHK) policies to survive the pandemic. In August 2021, the number of unemployed due to the pandemic was 1.82 million.

Then the workforce who reduced working hours due to the pandemic amounted to 17.41 million people (BPS, 2021). The increasing number of unemployed and the slowdown in business activities make it difficult for entrepreneurs to pay their obligations to financial institutions. In response, the government and the financial service authorities (OJK) provided various quantitative easing and economic stimuli.

The impact of the pandemic needs to be studied and how it affects the performance of Islamic banking, especially its role in dealing with the issue of the economic crisis. If Islamic banking fails to anticipate these problems, it will face many business risks (Fauziah, Fakhriyah, & Rohman, 2020). As an intermediary institution, Islamic banking plays a role in maintaining Indonesia's economic growth (Surya & Asiyah, 2020).

Islamic banks play a crucial role in fostering economic growth. During the pandemic, Islamic banks must innovate and mitigate risk to survive. Economic instability presents Islamic banks with both a challenge and an opportunity. (Sumadi, 2020). However, before the pandemic, financial institutions also faced the challenges of digitalization. Technology advancements can convert cash-based transactions into cashless ones. The influence of PPKM regulations on banking makes digitalization an alternative service. For industries to survive the expansion of the digital economy, they must initiate business transformations (Ansori, 2016).

The financial services industry cannot avoid technological developments. Instead, they may view it as a chance to improve customer service. (Fatimah & Hendratmi, 2020). The pandemic has succeeded in changing people's behavior to become digital-minded. Islamic banks must adapt their funding and financing strategies to digital business models (Sumadi, 2020). During the pandemic, people's satisfaction with digital banking services is influenced by: ease of use, efficiency, and security (Bankuoru Egala, Boateng, & Aboagye Mensah, 2021).

An efficient bank shows its ability to optimize resources to generate customer benefits. (Rahmi & Putri, 2019). Efficiency measures a bank's performance and stability in achieving profitability (Sari & Saraswati, 2017). The financial policy can be implemented effectively and precisely if banks are efficient (Awaluddin, Mutmainna, & Wardhani, 2019). Banking stability is significantly influenced by monetary stability. The exchange rate, inflation, and interest rates are monetary control factors. These three factors also include the market risks that banks face (Warjiyo, 2006)

Within the company, there are two efficiency components developed by Farrell (1957): technical efficiency and allocative efficiency. Technical efficiency is the company's ability to produce output from the inputs used. Meanwhile, allocative efficiency is a company that can optimize the use of inputs based on prices and applicable technology. Furthermore, the two

components are combined into economic efficiency. A firm is at an efficient scale if it can minimize the costs of obtaining output by using technology and at a given price level.

Management of customer funds is required to prioritize effectiveness and efficiency to encourage the growth of Islamic bank assets and profits (Hibatullah & Nurcahyani, 2021). After all, banking is a business entity that functions as a financial intermediary that allocates liabilities in the form of loans and other assets (Jiménez-Hernández, Palazzo, & Sáez-Fernández, 2019). Therefore, the concept of efficiency is measured using costs as inputs and profits as outputs. Business entities reduce costs to generate maximum profit (Rusydia, 2018).

Efficiency can be achieved optimally by minimizing inputs to produce a constant output or using fixed inputs to produce maximum output (Ahmad & Rahim Abdul Rahman, 2012; Sholihah, 2021). Efficiency measurement is not only calculated from financial ratios but using input and output variables (Puspitasari, Purnomo, & Triyono, 2017). Financial ratios are not able to find the factors causing inefficiency. Requires the appropriate approach to measure bank efficiency. Entities can use the causes of inefficiency as an evaluation and improve banking performance (Hossen & Rahmawati, 2016).

Efficiency can be measured through a non-parametric approach, namely Data Envelopment Analysis (DEA) (Holod & Lewis, 2011; Kamarudin, Hue, Sufian, & Mohamad Anwar, 2017). DEA is a linear programming method to measure an entity's efficiency or a Decision-Making Unit (DMU) (Ahmad & Rahim Abdul Rahman, 2012; Li, Li, & Zou, 2020). The DEA concept was first introduced by Charnes et al. (1978), and as a method, it was developed by Banker in 1984 (Banker, Charnes, & Cooper, 1984).

There are two models to measure efficiency through DEA: Constant Return to Scale (CRS) and Variable Return to Scale (VRS). The assumption of the CRS model is the similarity between the addition of inputs and outputs. Increasing the input by x will increase the output by x as well. Measurement of the CRS model is carried out on entities in optimal conditions. In the VRS model, adding the input of x does not cause the output to increase by x also. The additional output can be lower or higher. Entity measurement using the VRS model is not operating optimally (Rusydia, 2013).

Efficiency measured through input and output variables is divided into three approaches: production approach, intermediation approach, and asset approach (Hadad, Santoso, Ilyas, & Mardanugraha, 2003). The production method explains how the capacity of banks to extend credit is contingent on input factors such as labor and capital. The intermediation strategy also relies on the ability of banks to manage deposits and convert them into loans. On either side, the asset approach refers to a bank's capacity to drive capital to invest in assets.

Studies on efficiency in banking using the DEA method have also been carried out in several other countries, such as (Xu & Zhou, 2020), who conducted research in China. The finding of this study is that the performance of state-owned commercial banks is better than private banks. Jiménez-Hernández et al., (2019) conducting research on the banking industry in Latin America. The study results show that bank size and lending affect banking efficiency. Kamarudin et al. (2019) measured the efficiency of Islamic banks in Malaysia. The result is that the efficiency of domestic Islamic banks is lower than that of foreign-owned Islamic banks. The strength of market share, liquidity, and management significantly contributes to the efficiency of Islamic banks.

Meanwhile, this study was conducted to observe the resilience of Islamic Commercial Banks (BUS) in Indonesia during the pandemic. Input and output variables are measured to produce efficiency values using the DEA method. Figures obtained through the DEA method allow DMU to identify policies that develop economic activities that are not yet productive. According to economics, any business entity will constantly aim to maximize the output of its inputs.. So in DEA, the efficiency point is the ratio between the ratio of output to input (Rusydia, 2013).

Several studies have examined the efficiency of Islamic banks in Indonesia during the pandemic through an intermediation approach. Research conducted by (Himmawan & Firdausi, 2021) through the Variable Return to Scale (VRS) model obtained the results of highly efficient Islamic banks, namely BSM, BRIS, BMI, BPD NTBS, BAS, BVS, and BTPNS. Then banks with low efficiency are BNIS, BSB, BPS, BSB, BMS, BJBS, and MS.

Setyono, Istiqomah, Ilmundhita, & Mujib (2021) researched four Islamic banks (BRIS, BJBS, BCAS, and BSB). The result is that there has been a decrease in efficiency (inefficiency) in Islamic banks during the pandemic. This is because the value obtained by the four Islamic banks in the DEA calculation does not reach 100%. Furthermore, in a study conducted by (Sholihah, 2021), the results showed that during the pandemic, Conventional Commercial Banks (BUK) and Islamic Commercial Banks (BUS) experienced a significant decrease in efficiency. The reason is a decrease in income from fund-raising activities and financing distribution.

The focus of the three studies is to use an intermediation approach. While the research in this paper examines the efficiency of Islamic banks using a production approach. The intermediation approach is oriented towards DPK, which is then channeled through financing. During a pandemic, a study of the production method is necessary to determine which factors of production are utilized to generate income. The production factors used as input variables in this study include the number of employees, offices, capital, and total assets. At the same time, the output variables are financing and operating income.

The selection of variables was also motivated by the trend of efficiency performance through the transformation of digital services that had begun before and during the pandemic. This transformation had started before the pandemic and continued during it. This study will describe the performance of Islamic banks during the pandemic in terms of their customer service, business scale, financing, and profit margins..

METHOD

The method used to figure out the value of BUS efficiency is Data Envelopment Analysis (DEA) using MaxDea software. The DEA measurement states that if the Islamic bank is efficient, the value is 100%, but if it is inefficient, the value is less than 100%. The model used is Variable Return to Scale (VRS) which was developed by Banker et al. (1984) through a production approach. This model assumes that the ratio between the addition of inputs and outputs is that the company is not necessarily optimum.

Furthermore, this research is input-oriented to determine how the bank can use inputs to produce optimum output. Input and output variables are used to measure efficiency. The input variables consist of the number of Employees, Number of Offices, Total Assets, and Capital. At the same time, the output variables are Financing and Operating Income.

The sampling technique used in this research is purposive sampling. The object of this research is an Islamic Commercial Bank (BUS) registered with the Financial Services Authority (OJK). The data used is secondary data from the annual report for 2019-2021. In 2019-2020 the number of BUS was 14 BUS. However, for the 2021 annual report, the number of BUS was reduced to 12 banks because BSM, BRIS, and BNIS merged to become Bank Syariah Indonesia (BSI). Then specifically for Maybank Syariah Indonesia in 2021, it changed its name to Bank Aladin Syariah. The list of sample banks is as follows:

- a. Bank Aceh Syariah (BAS)
- b. BPD Nusa Tenggara Barat Syariah (BPD NTBS)
- c. Bank Muamalat Indonesia (BMI)
- d. Bank Victoria Syariah (BVS)
- e. Bank BRI Syariah (BRIS)
- f. Bank Jabar Banten Syariah (BJBS)
- g. Bank BNI Syariah (BNIS)
- h. Bank Syariah Mandiri (BSM)
- i. Bank Mega Syariah (BMS)
- j. Bank Panin Dubai Syariah (BPDS)
- k. Bank Syariah Bukopin (BSB)

- l. BCA Syariah (BCAS)
- m. BTPN Syariah (BTPNS)
- n. Maybank Syariah Indonesia (MSI)

RESULT

Descriptive Statistics

Descriptive statistics describe the data measured in quantitative research (Sugiyono, 2015). The output of the descriptive statistical test is used for each input and output variable obtained by the DEA. The results are presented in the table below.

Table 1. Descriptive Statistics

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
Employee	40	42	19449	3116.88	4349.249
Office	40	1	1615	181.50	298.620
Asset	40	715623	265289081	29736260.55	47491622.761
Equity	40	354243	25013934	3438938.15	4258678.735
Operating Income	40	36493	16441871	1911104.93	3075183.270
Financing	40	54	160970398	17292730.80	28640734.600
Valid N (listwise)	40				

Source: SPSS ver. 21 data processing

The data in the table show the condition of the variables as follows:

- a. The lowest number of employees (X1) is 42 at Bank Aladin Syariah in 2020. While the data for the most employees are at Bank Syariah Indonesia, with a total of 19,449 employees in 2021.
- b. The lowest data on the variable number of offices (X2) is one office unit by Bank Aladin Syariah from 2019-2021. Meanwhile, the maximum data were 1,615 units by Bank Syariah Indonesia in 2021.
- c. The lowest data variable of Asset (X3) is 715,623 (units of millions of rupiah). This data is the lowest total asset by Aladin Syariah in 2019. Meanwhile, the highest total asset is BSI in 2021, which is 265,289,081.
- d. The lowest data of equity variable (x4) is 354,243 (million rupiah) by Bank Victoria Syariah in 2019. The highest total equity is 25,013,934, which is the total equity of BSI in 2021.
- e. The lowest data of variable Y1 (operating income) is 36,493 million rupiahs by Bank Aladin Syariah in 2021. Meanwhile, the highest data is BSI's total operating income in 2021, amounting to 16,441,871 million rupiah.
- f. The lowest data of variable Y2 (financing) is 54 million rupiah by Bank Aladin Syariah in 2020. Meanwhile, the highest financing is 160,970,398 million rupiah by BSI in 2021.

Efficiency Analysis

The following is the result of processing efficiency values using MaxDea software. BUS with a score of 100% means efficient, whereas the bank is less efficient if it is less than 100%.

Table 2. Score of Efficiency BUS 2019-2021

BUS	2019	2020	2021
BAS	99,76%	96,54%	96,97%
NTBS	100%	92,02%	99,65%
BMI	100%	100%	67,12%
BVS	100%	100%	100%
BJBS	100%	88,26%	90,52%
BMS	100%	74,89%	100%
PDBS	100%	100%	100%
BSB	99,97%	100%	100%
BCAS	88,23%	83,93%	100%
BTPNS	100%	96,64%	100%
AladinS	100%	100%	100%
BRIS	87,21%	100%	-
BNIS	97,16%	91,63%	-
BSM	100%	100%	-
BSI	-	-	100%
Mean	98,02%	94,56%	96,23%

Source: MaxDEA Data Processing

The table above illustrates the efficiency score of BUS for three years, from 2019-2021. In 2019, from 14 BUS there were 9 BUS obtained 100% efficiency scores including NTBS, BMI, BVS, BJBS, BMS, PDBS, BTPNS, Aladin S, and BSM. Meanwhile, the other 5 banks did not achieve efficiency because had a score of less than 100%, which was in the range of 99.97% to the lowest of 87.21%. These include: BSB (99.97%), BAS (99.76%), BNIS (97.16%), BCAS (88.23%), and BRIS (87.21%). The average efficiency score of BUS during 2019 was 98.02%.

In 2020 the total BUS that obtained a 100% efficiency score was only seven BUS, a slight decrease from the previous year. This is due to the widespread pandemic in Indonesia, which impacts economic contraction. BUS that obtained efficient scores in 2020 are BMI, BVS, PDBS, BSB, Aladin S, BRIS, and BSM. Among the BUS that experienced an increase in score compared to the previous year were BSB and BRIS. As for a score less than 100%, 7 banks are in the range of 74.89%-96.64%. There was 4 BUS that decreased to be inefficient compared to the previous year, namely BTPNS (96.64%), BJBS (88.26%), BMS (74.89%), NTBS (92.02%). There was also a decrease in score for BNIS (91.63%), while BCAS had an increase in score to 83.93%. In general, efficiency has been declining, with the average score in 2020 being 94.56%.

In 2021 there will only be 12 BUS, because BSM, BRIS and BNIS have merged to become Bank Syariah Indonesia (BSI). BSI officially published its financial report in 2021. This year, the number of BUS that scored 100% was 8 BUS, namely: BVS, BMS, PDBS, BSB, BCAS, BTPNS,

Aladin S, and BSI. While the value of the other 4 BUS is in the range of 67.12%-99.65%. The four BUS are NTBS (99.65%), BAS (96.97%), BJBS (90.52%), and BMI (67.12%). In general, there has been an increase in BUS efficiency in 2021, with an average score of 96.23%.

In the 3 year observation period, there are 3 BUS that consistently score 100% in a row, namely: BVS, PDDBS, and Aladin Syariah. BSM obtained an efficient score of 100% for 2 years, but in 2021 it merged into BSI with an efficiency score of 100%.

DISCUSSION

The modern era presents various challenges to the financial sector. Therefore, many researchers are interested in conducting more in-depth research. Especially in terms of market competition, risk factors, and efficiency performance (Zhao et al., 2021). Efficiency performance during a pandemic needs to be measured to describe the banking industry's resilience in facing a pandemic. Given that Islamic banks were reputed to be crisis-resistant during the previous crisis.

Referring to the results of data processing using the DEA method with the VRS model, it was found that some Islamic banks experienced shocks due to the pandemic. Still, most of them were able to show their resilience. The average efficiency score of Islamic banks decreased in 2020 and slightly increased the following year.

The highest average efficiency score occurred in 2019 (98.02%). The pandemic had not yet spread in Indonesia in that period, although it impacted many other countries. As a result of the pandemic's spread since March 2020, the impact of the new pandemic can be observed in the decrease in the average efficiency score from 98.02 percent to 94.56 percent. This condition impacts the performance of financial institutions, which have decreased significantly, including Islamic banks. The results of this study follow earlier research (Ningsih & Mahfudz, 2020) which states that the intermediation function of Islamic banks in raising funds and financing tends to decline from December to March 2020. Setyono et al. (2021) state that the decline in efficiency in 2020 caused Islamic banks to need to achieve financing targets and minimize expenditure costs. The decline in income from financing also affects the efficiency of Islamic banks during the pandemic (Notalin, Afrianty, & Asnaini, 2021).

Furthermore, in 2021 the average efficiency score began to increase slightly from the previous year. The increase occurred from 94.56% to 96.23%. Although this figure is lower than a score in 2019, it still has a positive meaning for an increase in performance during the pandemic.

Islamic banks with a wide range of services and extensive business sizes, such as BSI (BNIS, BRIS, BSM) and BTPNS, tend to keep their efficiency scale. On the other hand, the surprising result is that BMI during 2019-2020 remained at the 100% efficiency scale. However, in 2021 it experienced a significant decrease of 32.88%. In line with research by Rusmita & Putri (2020), BMI

obtains the lowest efficiency score compared to other Islamic banks due to cost and profitability. Although the management of production costs has improved performance, it still needs to be managed efficiently, especially in financing.

According to the data processing of this study, the cause of inefficiency on the service side of Islamic banks is an overburdening of employees and offices. For example, when average efficiency falls in 2020, BAS is burdened by an excess of 71 employees and 6 office units. Similarly, BTPNS is overburdened with 1,697 employees and 3 office units. Meanwhile, inefficiency occurs in business size because excess assets and capital are not used optimally in business operations. This figure is derived from the potential increase calculated by MaxDEA. According to Pratikto and Sugianto (2011) research, potential improvements can be used as evaluation material for Islamic banks to determine policies such as adding or reducing targets on the variables studied.

During the pandemic, the average efficiency score of Islamic banks is close to 100 percent, indicating near-perfect efficiency. During the pandemic, Islamic banks demonstrated the best performance, despite a decline in efficiency ratings. These findings are consistent with the findings of Rahmi and Putri (2019), who conducted research on the performance of Islamic banks during a crisis and concluded that Islamic banking demonstrated satisfactory performance during times of crisis. An efficient Islamic bank is able to maximize profit by maximizing resource utilization. According to Pratikto and Sugianto's (2011) research, the efficiency performance of Islamic banks before and after the 2008 financial crisis remained stable. DEA calculations also demonstrate productive benchmarking outcomes for Islamic banks. Then, an ineffective Islamic bank will serve as a model for an effective Islamic bank.

The government's stimulus policy influenced the banking industry's resilience during the pandemic. OJK issued a policy, namely POJK No. 11/Pojk.03/2020 concerning National Economic Stimulus as a Countercyclical Policy for the Impact of the Spread of Covid-19. The policies listed include credit/financing restructuring by a) Reduction of interest arrears, b) Extending the term, c) Reducing principal arrears, d) Increasing credit/financing facilities, and e) Converting financing into temporary equity participation.

According to Sholihah (2021), the banking sector suffered losses as a result of the pandemic crisis. Nevertheless, with government stimulus, the decline in Islamic bank efficiency is still manageable. According to Igan, Mirzaei, and Moore (2022), who conducted research on 52 nations, macroprudential policies could reduce bank risk during the pandemic. A policy of credit restructuring during the pandemic can preserve the stability of banks as financial intermediaries (Bidari & Nurviana, 2020).

Another factor is that the growth of digital banking services can also affect the efficiency of Islamic banks during the pandemic. Maximum use of information technology can minimize input variables because banks do not need to open many branches. Banks seek to maximize transaction services via smartphones in line with POJK policy No.19/POJK.03/2014 regarding officeless financial services in the context of financial inclusion (Himmawan & Firdausi, 2021). According to research by (Raza, Umer, Qureshi, & Dahri, 2020), services through e-banking can increase e-customer satisfaction in conducting transactions. However, the quality of service has a positive influence, especially for customers who are more interested in using online facilities.

Facing the digitalization era and the pandemic situation, Islamic banks must show their positive performance to gain the trust and loyalty of their consumers. Various policies were formulated in an effort to increase productivity and efficiency performance. This policy is vital to keep the operational stability of Islamic banks (Rusmita & Putri, 2020). To support the performance of Islamic banks, it is always necessary to support policymakers, regulators, and other stakeholders (Kamarudin, Sufian, et al., 2017).

The positive performance of Islamic banks in dealing with various crises should increase public confidence in Islamic banks. Islamic banks during the pandemic have shown their resilience, as they have been able to face previous crises. The existence of restrictions on work in the office during the pandemic does not reduce the performance of Islamic banks with many employees. Even the data shows that banks that have large business sizes and employees can still survive during the pandemic and digitalization period. This could also indicate that digitalization in the banking sector still has many limitations. Both from the bank's consumer side or the bank's internal side. Thus, the strategic role of human resources in banking services is still broad.

CONCLUSION

This study shows that most Islamic banks are resilient to facing the pandemic. This can be seen from its efficiency performance which has a good score. This condition is supported by various micro-macroprudential policies by regulators and digital adaptation. Work office restrictions during the pandemic do not have a significant impact on reducing performance. Even banks with a large number of employees consistently show good efficiency scores.

The authors realize that there are limitations to this study, as in the determination of variables and research objects that have not fully described the condition of Islamic banks in Indonesia because the sample is limited to the Islamic Commercial Banks (BUS) category. The results of this efficiency study can be confirmed through other efficiency research approaches so that it can enrich the study of the efficiency of Islamic banking.

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