**Signifikan:** Jurnal Ilmu Ekonomi
Volume 12 (1), 2023: 161 - 174
P-ISSN: 2087-2046; E-ISSN: 2476-9223

# Determinant of Efficiency in the Indonesian Islamic Banks

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**JEL Classification:**
C02
C14
C23
G01

*Received: 09 January 2023*

*Revised: 06 February 2023*

*Accepted: 11 February 2023*

*Available online: 15 April 2023*

*Published regularly: April 2023*

**Abstract**

*This study aims to analyze the factors that influence the efficiency level of Islamic commercial banks in Indonesia. The research employs a panel data analysis and a non-parametric Data Envelopment Analysis (DEA) to measure efficiency. The panel data analysis showed that company size, profitability, liquidity, and management significantly affect the level of efficiency of the Islamic banks in Indonesia. At the same time, capital and funding risk have no significant impact. The efficiency of the Islamic banks in Indonesia should be maintained by balancing the distribution of assets, ensuring portfolio diversification, maintaining sufficient liquidity, and paying attention to management quality. The originality of this study, to the best of the author's knowledge, is that it is the first study to examine the determinants of efficiency in Indonesian Islamic commercial banks using quarterly data from the period of 2015-2020. As a result, the data analyzed has a sufficient amount.*

**Keywords:**

efficiency; data envelopment analysis; panel data models; Islamic bank

**How to Cite:**

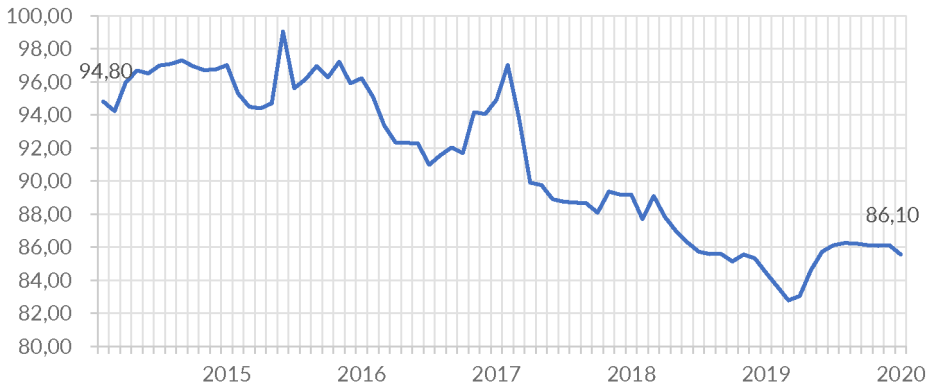
Aliyah, H., Hamid, A., & Al Arif, M. N. R. (2023). Determinants of Efficiency in the Indonesian Islamic Banks. *Signifikan: Jurnal Ilmu Ekonomi*, *12*(1), 161-174. https://doi.org/10.15408/sjie.v12i1.30376.

## INTRODUCTION

Efficiency is a key performance parameter in the financial industry, reflecting how well an Islamic bank manages its resources and selects the right factors to achieve its goals (Spong et al., 1995; Noor & Ahmad, 2012; Mezzi, 2018; Shah et al., 2019). Islamic banks implement various measures to enhance efficiency, which allows them to increase their income per unit of cost and offer low margins to customers (Lucchetti et al., 2001). Hence, for an Islamic bank or the Islamic banking industry, efficiency plays a crucial role in maintaining a healthy and sustainable financial performance (Rosman et al., 2014).

Hadad et al. (2003) state that to achieve maximum efficiency in the banking sector, banks must find a balance between optimal and available input levels or minimize input while maximizing output. However, Islamic banks need help achieving good efficiency levels in their operations. To comply with the principles of Islamicness and Shariah, Islamic banks must abide by specific criteria in conducting financial transactions, which can add complexity to their operations and increase costs, thus affecting their overall efficiency (Hadad et al., 2003; Laila et al., 2019). In Islamic banking, the operational cost-to-operating income ratio is a widely used performance indicator to assess the efficiency of operational activities. Figure 1 shows the overview of the average operational cost to operating income ratio of Islamic banks in Indonesia.

**Figure 1. The Operational Cost to Operational Income Ratio of Islamic banks in Indonesia**




Source: Financial Services Authority, 2021

According to Islamic banking statistics, it is known that the operational cost to operating income ratio has decreased, which can be interpreted that, on average, Islamic banks in Indonesia are becoming more efficient. In other words, Islamic banks in Indonesia generate more income from each unit of cost spent. On the other hand, the efficiency level can also show the competitive conditions in the Islamic banking industry. In 2020 there were 14 full-fledged Islamic banks and 20 Islamic business units operating in Indonesia. Figure 2 describes the efficiency conditions of each Islamic bank in the Islamic banking industry.

Efficiency level becomes crucial for each Islamic bank to handle the intensifying competition in the Islamic banking sector (Firdaus & Hosen, 2013). As a whole, Figure 2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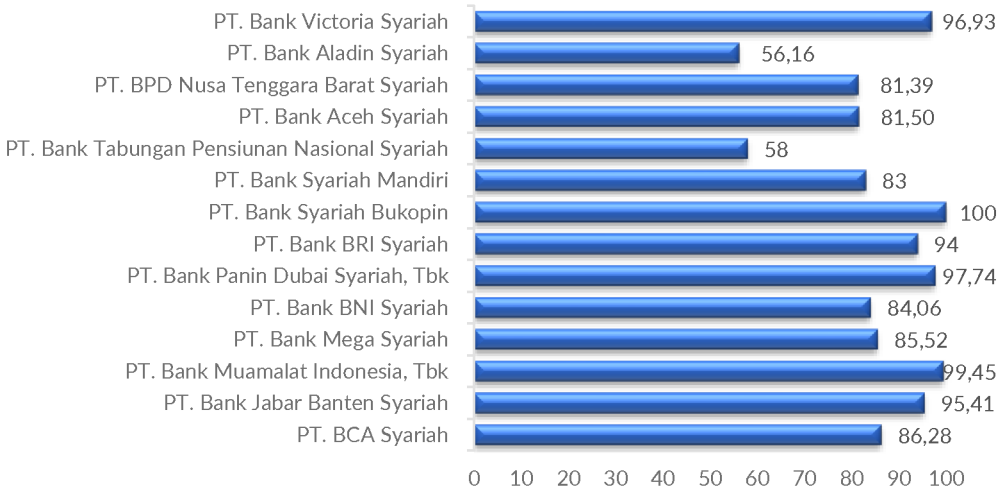
indicates that the efficiency level in the Islamic banking industry in Indonesia is quite diverse. The Bank of Aladin Sharia is the most efficient Islamic commercial bank, with an operational cost-to-operating income ratio of 65.16. On the contrary, the Bank of Shariah Bukopin is known to be the least efficient, with a ratio value of 100.

**Figure 2. Operational Cost To Operational Income Ratio Of Each Islamic Commercial Bank In Indonesia**




Source: Financial Services Authority, 2021

The differences in the efficiency levels of each Islamic bank can be attributed to various factors (Haris & Hastuti, 2013; Muljawan et al., 2014; Sutawijaya & Lestari, 2009). To enhance their efficiency, Islamic banks must identify these factors. Knowing the factors affecting efficiency will assist the Islamic bank in formulating the appropriate strategy to improve its performance. Improved efficiency enhances customer and investor confidence in the Islamic bank (Sahrullah & Suprayogi, 2022).

Sahrullah & Suprayogi (2022) state that efficiency can be influenced by factors beyond those used in efficiency analysis. Previous studies have revealed that firm size can have a positive impact on efficiency, as demonstrated in research by Jiménez-Hernández et al. (2019), Kamarudin et al. (2019), Liviawati et al. (2019), Lotto (2019), Devi & Firmansyah (2020), and Darlis & Utary (2022).

Larger companies have more significant resources in capital ownership, labor, and technology that can be used to improve the performance of their operational activities. Significant capital will strengthen the company's financial position, allowing the Islamic commercial bank to finance operational activities and investments without adding capital from other sources, as evidenced in the research of Lotto (2019) and Samad (2019).

Conversely, research conducted by Samad (2019), Fernandes et al. (2018), and Liang et al. (2018) found the opposite larger banks are prone to inefficiency issues stemming from complex bureaucratic processes. These numerous divisions hinder communication between management and staff and the difficulties in adapting to changes in the business

environment. Additionally, it has been observed that adverse effects on efficiency occur during overinvestment and incorrect investment decision-making.

Positive profitability boosts the bank's resilience and supports its investments. It can also serve as an indicator for comparing a bank's efficiency to its competitors (Kamarudin et al., 2019; Liang et al., 2018; Lotto, 2019; Sufian & Kamarudin, 2015). Liang et al. (2018) and Lotto (2019) found that profitability significantly positively affects bank efficiency. However, Darlis & Utary's (2022) findings suggest that profitability negatively affects efficiency. Conversely, the studies conducted by Miftahurrohman (2019) and Devi & Firmansyah (2020) found that profitability has little impact.

The research conducted by Lotto (2019) found that liquidity positively impacts the efficiency of the Islamic banks. Adequate liquidity enables faster transaction processes in Islamic banks. Conversely, a higher level of liquidity in Islamic banks can have a negative impact on efficiency, which can occur when Islamic banks allocate too much of their funds to unproductive activities such as reserves that exceed their needs (Yuniari & Badjra, 2019).

Financing risk can negatively affect the efficiency of the Islamic banks, as evidenced by numerous studies, including the studies conducted by Fernandes et al. (2018), Jiménez-Hernández et al. (2019), Liang et al. (2018), Samad (2019), and Wanke et al. (2016). In theory, financing risk decreases the income of Islamic banks and increases the bank's burden to address the risk.

The impact of management on the efficiency of the Islamic banks can be assessed through the net operating margin (NOM) ratio. NOM reflects the bank's ability to earn profits from its revenue. Research by Pambuko (2016) and Liviawati et al. (2019) has shown that management, as measured by the NOM ratio, positively affects efficiency. The higher the NOM ratio, the more profit the bank can make from its revenue, and therefore, the Islamic bank can allocate more funds for reserve, capital enhancement, or lending to third parties.

Based on the previous studies discussed above, it is known that there needs to be more consistency in the findings of the investigations regarding the impact of differentiating factors on the efficiency of Islamic commercial banks in Indonesia. The position of this study is to study further the factors that cause differences in the efficiency levels of each Islamic commercial bank in Indonesia. Previous studies used relatively small sample data. The study conducted by Lestari & Huda (2020) used 40 research samples, Koiri & Erdkhadifa (2022) used 26 samples, Darlis & Utary (2022) used 60 samples, and Sahrullah & Suprayogi (2022) used 55 research samples. This study aims to fill this research gap by utilizing more research samples. So, this research will examine the determinants of efficiency in the Indonesian Islamic banking industry.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## METHODS

The observed object in this research is the population of Islamic commercial banks operating in Indonesia. The sample used in the research consists of 9 full-fledged Islamic banks, including Bank of Central Asia Shariah (BCAS), Bank of Jabar Banten Shariah (BJBS), Bank of Muamalat Indonesia (BMI), Bank of Mega Shariah (BMS), Bank of Negara Indonesia Shariah (BNIS), Bank of Panin Dubai Shariah (BPDS), Bank of Rakyat Indonesia Shariah (BRIS), Bank of Shariah Bukopin (BSB), and Bank of Shariah Mandiri (BSM).

The data used in the research is secondary data collected from the financial statements of each Islamic commercial bank for six years, from 2015 to 2020. The data period used is quarterly data. Hence, the total number of samples analyzed in this research is 216.

The method used in this study to analyze the factors impacting the efficiency of Islamic commercial banks is panel data analysis. Before that, the efficiency level of these banks was analyzed using the non-parametric Data Envelopment Analysis (DEA) method. The DEA is a mathematical model applied to data observations to produce a relative efficiency score and the potential for efficient production (Rusydiana & Hasib, 2020; Cooper et al., 2011). The analysis tool used in this study is MaxDEA 8 Basic.

A decision-making unit (DMU) is considered efficient if it scores 100%. Full efficiency is reached when neither inputs nor outputs need to be improved. The efficiency frontier is the limit of efficiency, and the efficiency scores generated from processing inputs and outputs with different sizes and amounts for each DMU determine it.

To analyze efficiency using the DEA method, the input variables used consist of Labor Costs (I1), Deposit Funds (I2), and Other Operating Expenses (I3). The output variables consist of Murabahah financing (O1), Musyarakah and Mudharabah investment (O2), Ijarah/Leasing financing (O4), and Securities (O5).

This study uses Panel Regression as the data processing method to analyze the factors affecting the efficiency of Islamic commercial banks in Indonesia. This method was selected because the data being analyzed is panel data, which combines time series and cross-section data.

The first step in panel regression testing is to determine the best method among Pooled Least Square (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM) models. The hypothesis test will be based on chi-square statistics. As this test uses three different tests, there are three criteria for rejecting the null hypothesis. These three criteria are explained below:

Chow Test: $H_0$ is rejected if Prob F < α (0.05).

LM Test: $H_0$ is rejected if the Chibar2 Probability < α (0.05).

Hausman Test: $H_0$ is rejected if the Chi2 Probability < α (0.05).

Based on the variables used, the regression model is as follows:

$$SEF_{it} = \alpha + \beta_1 TTA_{it} + \beta_2 ROA_{it} + \beta_3 CAR_{it} + \beta_4 FDR_{it} + \beta_5 NPF_{it} + \beta_6 NOM_{it} + \varepsilon_{it}$$

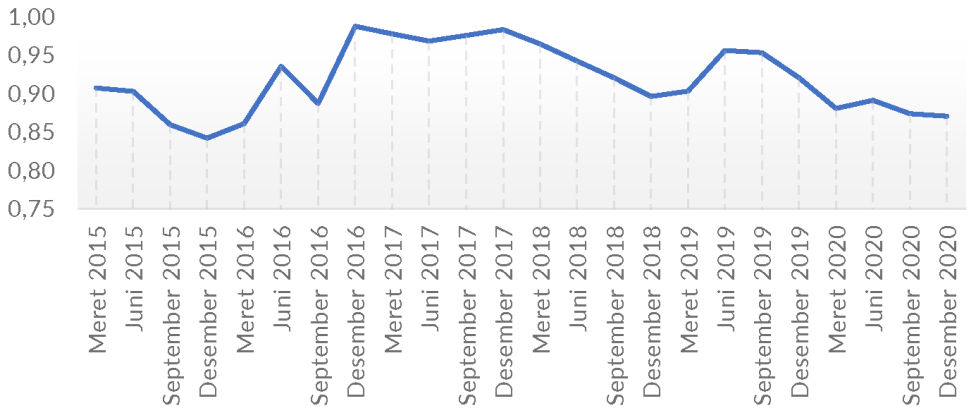
The used variables in the regression model are: SEit, which is the efficiency score obtained from the DEA analysis; TTAit, which is the total assets of bank i in period t and serves as a proxy for the bank's size; ROAit, which represents the return on asset of bank i in period t and serves as a proxy for the profitability factor; CARit, which is the capital adequacy ratio of bank i in period t and serves as a proxy for the capital factor; FDRit, which is the financing to deposit ratio of bank i in period t and serves as a proxy for the liquidity factor, which is believed to have a positive impact on the efficiency of Islamic commercial banks; NPFit, which is the non-performance financing of bank i in period t and serves as a proxy for the financing risk factor; and lastly, NOMit, which represents the net operating margin of bank i in period t and serves as a proxy for the management factor.

## RESULT AND DISCUSSION

### Result

The efficiency condition of Islamic commercial banks in Indonesia from 2015 to 2020 is generally obtained by looking at the average efficiency score of nine Islamic commercial banks in Indonesia over the research period. Figure 3 shows the average efficiency score of all full-fledged Islamic banks.

**Figure 3. Average Efficiency Score of All Full-fledged Islamic Banks**




Source: Output from MaxDEA 8 Basic software

The analysis results show that the average combined efficiency score obtained by Islamic commercial banks in Indonesia has a fluctuating trend. This result aligns with previous research by Lestari & Huda (2020), who also found that the efficiency trend of the Islamic banking industry occasionally experiences fluctuations. The highest efficiency level occurred in December 2016 at 0.99. Meanwhile, the lowest efficiency level of Islamic commercial banks occurred in December 2015 at 0.84. At the end of 2020, the average efficiency score was 0.87. The lowest average efficiency score of the combined Islamic commercial banks was 0.84 in December 2015. Furthermore, the efficiency analysis results for each Islamic commercial bank are shown in Table 3.


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**Table 3. Efficiency of Islamic Commercial Banks from 2015 to 2020**

| No. | DMU | Average | Number of Perfect Efficiencies | Rank |
|---|---|---|---|---|
| 1 | BCAS | 0,959 | 12 | 4 |
| 2 | BJBS | 0,872 | 7 | 7 |
| 3 | BMI | 0,986 | 12 | 2 |
| 4 | BMS | 0,786 | 2 | 9 |
| 5 | BNIS | 0,984 | 11 | 3 |
| 6 | BPDS | 0,939 | 8 | 5 |
| 7 | BRIS | 0,936 | 7 | 6 |
| 8 | BSB | 0,827 | 7 | 8 |
| 9 | BSM | 0,987 | 20 | 1 |

Sumber: Output software MaxDEA 8 Basic

Table 3 presents the results of the efficiency testing of 9 full-fledged Islamic banks in Indonesia. The full-fledged Islamic bank with the perfect efficiency score of 1 in each period is Bank of Shariah Mandiri (BSM), with 20 out of 24 periods of perfect efficiency. Conversely, the bank with the lowest efficiency (highest inefficiency) with an average score of 0.786 is Bank of Mega Shariah (BMS), with only two periods of efficiency. The second-ranked Islamic commercial bank is the Bank of Muamalat Indonesia (BMI), which has an average efficiency score of 0.986 and achieved perfect efficiency 12 times. The third-ranked bank is the Bank of Negara Indonesia Shariah (BNIS), with an average efficiency score of 0.984 and 11 instances of perfect efficiency. Bank of Central Asia Shariah (BCAS) ranks fourth with an average efficiency score of 0.959 and 12 instances of perfect efficiency. The fifth-ranked bank is the Bank of Panin Dubai Shariah (BPDS), with an average efficiency score of 0.939 and 8 instances of perfect efficiency. Bank of Rakyat Indonesia Shariah (BRIS) ranks sixth with an average efficiency score of 0.936 and 7 instances of perfect efficiency. Bank of Jawa Barat dan Banten Shariah (BJBS) ranks seventh with an average efficiency score of 0.872 and 7 instances of perfect efficiency. The eighth-ranked Islamic commercial bank is the Bank of Shariah Bukopin (BSB), with an average efficiency score of 0.827 and 2 instances of perfect efficiency.

The panel data analysis test was conducted to analyze what factors determined the efficiency level of full-fledged Islamic banks in Indonesia during 2015-2020. In the panel data analysis, in order to obtain a regression model, the best model needs to be selected. Table 4 shows the summary of the best model selection test.

**Table 4. Summary of the Results of the Best Model Selection Test**

| Test | Model Selection | Result | Selected Model |
|---|---|---|---|
| Uji Chow | PLS or FEM | 0,000 < α (0,1). | FEM |
| LM Test | PLS or REM | 0,000 < α (0,05). | REM |
| Hausman Test | REM or FEM | 0.0575< α (0,05). | REM |
| Conclusion: The selected model is REM. | | | |

Table 3 shows that the results of the Chow test produced a probability value of 0.0000. This result indicates that the probability value is smaller than 0.05. Hence, this model's null hypothesis (H0) is rejected, and the best estimation method used is the Fixed Effect Model (FEM). Additionally, the LM test results resulted in a probability value of 0.000, which is also less than 0.05. As a result, the null hypothesis was rejected, and the conclusion was that the Random Effect Model (REM) is the best model for studying the impact of cash flow on efficiency.

The final test to determine the best model was the Hausman test, which produced a probability value of 0.1413. This value indicates that the probability value is larger than the significance level (0.05), so the null hypothesis for this model is accepted. Hence, based on the Hausman test, the best model was determined to be the Random Effect Model (REM).

The regression model, which was obtained, next, of the factors affecting the efficiency level of Sharia Commercial Banks in Indonesia is as follows:

$$SEF_{it} = -0{,}9635 + 0{,}0541\,TTA_{it} + 0{,}0276\,ROA_{it} + 0{,}0443\,CAR_{it} + 0{,}2463\,FDR_{it} - 0{,}0085\,NPF_{it} - 0{,}0175\,NOM_{it} + \varepsilon_{it}$$

The results of the panel regression testing showed that the constant value is -0.9635. This indicates that if all the independent variables are equal to zero, the efficiency value would be -0.9635. The findings indicate that the size of the company, profitability (P<|t|), capital, liquidity, loan risk, and management have a significant impact on efficiency when considered together. To examine the impact of each individual independent variable on the dependent variable, partial tests or T-tests are performed. If the probability value is less than 0.05, it can be concluded that the independent variable has a significant effect on the dependent variable. Table 5 shows the results of the t-test.

**Table 5. T-test Result**

| | Coef. | Std. Err. | Z | P<\|t\| | [95% Conf. | Interval |
|---|---|---|---|---|---|---|
| Total Asset (TTA) | 0,0541 | 0,0141 | 3,840 | 0,0000 | 0,0265 | 0,0818 |
| Return on Asset (ROA) | 0,0276 | 0,0104 | 2,650 | 0,0080 | 0,0072 | 0,0481 |
| Capital Adequacy Ratio (CAR) | 0,0443 | 0,0327 | 1,360 | 0,1750 | -0,0197 | 0,1084 |
| Financing to Deposit Ratio (FDR) | 0,2463 | 0,0665 | 3,700 | 0,0000 | 0,1159 | 0,3767 |
| Non-Performing Financing (NPF) | -0,0085 | 0,0098 | -0,870 | 0,3820 | -0,0276 | 0,0106 |
| Net Operating Margin (NOM) | -0,0175 | 0,0075 | -2,330 | 0,0200 | -0,0322 | -0,0028 |
| cons | -0,9635 | 0,1929 | -4,990 | 0,0000 | -1341636 | -0,5854 |

Source: Stata Output Results, 2022

The analysis of each variable revealed that the size of the company (TTA), profitability (ROA), liquidity (FDR), and management (NOM) had a significant impact on efficiency. Meanwhile, capital (CAR) and loan risk (NPF) was found not to have a significant impact. The panel regression results showed that the coefficient of determination (R Square) of the research model had an overall R Square value of 0.2628, indicating


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that the size of the company, profitability, capital, liquidity, loan risk, and management contributed 26.28% to the efficiency of Sharia Commercial Banks. The remaining 73.72% is influenced by other variables not studied.

## DISCUSSION

The results of the panel data analysis, as shown in Table 5, indicate that bank size has a significant and positive impact on efficiency. The panel regression analysis found that the size of the full-fledged Islamic bank, as measured by total assets (TTA), has a coefficient of 0.0541. This result means that a one-unit increase in total assets leads to a 0.0541-unit increase in efficiency and vice versa. This finding aligns with the results of efficiency analysis using the DEA method. The most efficient bank was the full-fledged Islamic Bank with the most significant asset ownership, BSM.

This finding is consistent with previous studies, such as those by Devi & Firmansyah (2020), Darlis & Utary (2022), Jiménez-Hernández et al. (2019), Kamarudin et al. (2019), and Lotto (2019), which suggest that larger banks have more resources and capabilities that can positively impact efficiency. This condition is due to several factors, such as larger companies having more resources like capital, labor, and technology to enhance their operational performance, better risk management capabilities, and more significant opportunities to improve efficiency through broader market access and economies of scale (Darlis & Utary, 2022; Devi & Firmansyah, 2020; Miftahurrohman, 2019).

However, studies by Haryanto (2018) and Samad (2019) suggest that large size only sometimes leads to high efficiency. Large banks can suffer from inefficiencies due to complex bureaucracy, poor communication, and difficulty adapting to changing business environments. Additionally, the regression analysis shows that profitability, proxied by Return on Assets (ROA), significantly impacts efficiency, with a value of 0.0276. This result means that a one-unit increase in profitability leads to a 0.0276-unit increase in efficiency. High profitability reflects the bank's ability to generate profits through effective management of its assets, which is consistent with previous research by Liang et al. (2018) and Lotto (2019).

Positive profitability helps increase the bank's resilience and facilitates future investments, as retained profits can become a source of funding that improves operational performance. As a result, general Islamic banks that generate more profit can allocate their profits as a source of capital for business growth rather than relying on external funding sources. This result means that profitability significantly impacts the efficiency of the Islamic banks (Sari & Saraswati, 2017; Bayuny & Haron, 2017). However, the findings of this research are in contrast with those of Miftahurrohman (2019), Devi & Firmansyah (2020), and Koiri & Erdkhadifa (2022), who found that profitability does not have a significant impact on efficiency. Meanwhile, research conducted by Darlis & Utary (2022) found that profitability has a negative impact on efficiency.

Next, the Capital Adequacy Ratio (CAR) variable, which serves as a proxy for bank size, has a positive impact of 0.0443, indicating that capital (CAR) positively affects efficiency. Therefore, if capital (CAR) increases by one unit, efficiency will increase by

0.0443 units and vice versa. However, the data shown in Table 5 suggests that the impact of capital is insignificant. Generally, a more extensive capital base strengthens a company's financial position, allowing Islamic banks with more capital to boost production capacity and enlarge their production scale. Furthermore, with more significant capital, Islamic banks can reduce their unit transaction costs by adopting more advanced technology. Previous studies by Lotto (2019) and Samad (2019) have found a significant positive effect from the CAR variable.

Conversely, studies conducted by Fernandes et al. (2018) and Liang et al. (2018) have revealed a negative impact. A negative effect on efficiency can occur if overinvestment occurs or investment decisions are misguided due to a lack of attention to reducing high costs. Negative impacts can also result from over-expansion, which may slow decision-making processes and lead to unnecessary expansion.

The panel data analysis test shows that liquidity is the most significant factor affecting efficiency, as measured by the Financing to Deposit Ratio (FDR) variable, which has a value of 0.2463. It has been established that liquidity positively impacts the efficiency of the Islamic banks. A one-unit increase in liquidity (FDR) leads to a 0.2463-unit increase in efficiency and vice versa. These findings align with the research of Liviawati et al. (2019), who also found that liquidity positively impacts the efficiency of the Islamic banks. The study conducted by Lotto (2019) also supports these findings. It revealed that an increase in liquidity, as reflected by a higher FDR ratio, leads to an increase in financing disbursement, a primary source of income for Islamic banks. Increased financing leads to higher profit potential and improved operational efficiency. These results demonstrate that Islamic banks with high FDR ratios effectively manage their funds and make intelligent investments, improving operational efficiency (Pambuko, 2016). Therefore, liquidity plays a crucial role in supporting the sustainability and growth of Islamic banks.

However, previous research has provided different results. Yuniari & Badjra (2019) and Darlis & Utary (2022) found that high liquidity negatively impacts the efficiency of the Islamic banks. A high FDR indicates that more funds are being disbursed for financing, leading to a more significant margin for the bank. However, when the bank disburses funds to sectors with low profitability, it faces a significant burden to meet its obligations to fixed-term deposits. This results in an opportunity cost for the bank.

The following findings suggest that the risk-financing factor, as represented by the Non-Performing Financing (NPF) variable, has a negative impact on efficiency, as indicated by a coefficient value of -0.0085. This result means that if the financing risk increases by one unit, efficiency will decrease by 0.0085 units, and vice versa. However, Table 5 shows that the NPF variable has an insignificant effect on efficiency, which aligns with the research of Miftahurrohman (2019), Koiri & Erdkhadifa (2022), and Darlis & Utary (2022). This result contradicts earlier studies by Fernandes et al. (2018), Jiménez-Hernández et al. (2019), Liang et al. (2018), Samad (2019), and Liviawati et al. (2019), which found that NPF has a significant impact on efficiency.

According to Liviawati et al. (2019), an increase in NPF in an Islamic commercial


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bank can lead to operational disruptions, particularly in liquidity. The higher NPF results in increased costs for collecting debt and potential legal action, negatively impacting the bank's capital and solvency ratio. This condition reduces the bank's ability to disburse new credit and slows business growth, resulting in inefficiencies. Additionally, high NPF increases costs associated with losses, further impacting the bank's liquidity and reducing the quality and availability of financing provided by the bank (Miftahurrohman, 2019). The impact of NPF on liquidity issues in Islamic commercial banks leads to a tightening of financing, decreasing efficiency levels (Jiménez-Hernández et al., 2019; Liang et al., 2018; Samad, 2019; Wanke et al., 2016).

The panel data analysis results indicate that the management factor, proxied by the Net Operating Margin (NOM) variable, has a negative and significant effect on efficiency, with a coefficient of -0.0174. This result means that a one-unit increase in the management value (NOM) results in a 0.0174 unit decrease in efficiency, and vice versa. The low negative impact of management suggests that the Islamic commercial bank could be more efficient in managing operational costs and generating profit from operations. This conclusion aligns with previous research by Liviawati et al. (2019) and Suryanto & Susanti (2020). Furthermore, the findings indicate that a high net operating ratio does not guarantee that the Islamic commercial bank has good efficiency. This condition is because if the income of the Islamic commercial bank is derived from an unstable source, such as margins from investment products, then a high net operating margin does not guarantee a high level of efficiency in the bank (Suryanto & Susanti, 2020).

## CONCLUSION

This research aims to analyze the impact of firm size, profitability, capital, liquidity, financing risk, and management on the differences in the efficiency levels of Sharia commercial banks in Indonesia. The Data Envelopment Analysis (DEA) results indicate that BSM is the Sharia commercial bank with excellent efficiency and ranks first in the average efficiency score, with 20 out of 24 periods and an average perfect efficiency score of 1. In contrast, BMS is the Sharia commercial bank with the highest level of inefficiency. BMI is ranked second, followed by BNIS, BCAS, BPDS, BRIS, BJBS, and BSB. The panel data analysis showed that firm size (TTA), profitability (ROA), liquidity (FDR), and management (NOM) significantly affect the differences in efficiency levels in Sharia commercial banks in Indonesia. At the same time, capital (CAR) and financing risk (NPF) have no significant impact.

In order to operate efficiently, Islamic banks must manage their total assets with a balanced and proportional distribution between productive assets and assets with potential profits and assets with an acceptable level of risk. They should ensure that investing some funds in productive assets such as investment financing and others in assets with good potential profits diversifies the asset portfolio. Additionally, Islamic banks should closely monitor their liquidity levels to remain adequate and meet banking transaction requirements. On the gathering side, they need to manage sufficient liquid assets to match liquidity needs for financing operations. Therefore, banks that have yet to reach

a perfect level of efficiency should work towards improving their liquidity by receiving funds from various sources to boost financing disbursements. On the management side of financing disbursements, evaluations of financing diversification offered in various products should be conducted based on each Sharia contract pattern. Moreover, Islamic banks must address the adverse effects of management factors by analyzing management performance that may lead to operating costs and continually evaluating the performance of their workforce, taking corrective action if required. Adopting more efficient technology to support smoother operational processes can also achieve this condition.

Some limitations of this research include the limited data used in this study, as Islamic banks continue to grow and have diverse data conditions. Additionally, this research only examines Islamic commercial banks as the study sample, so it does not reflect the broader Islamic finance industry. The variables used in this study may need to be revised for the conditions and circumstances of the observed Islamic banks, which can impact the research outcomes. Hence, it is hoped that future research will broaden the observation scope and either replace or supplement the observation variables to be more pertinent.

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