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*Original Article*

# Analyzing the Sharia Cooperatives Efficiency in Aceh Province, Indonesia

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**Abstract:** This study analyzes the efficiency level and the factors that influence the efficiency of Sharia cooperatives in 16 districts/cities in the Aceh province during the 2020-2022 period. The Data Envelopment Analysis method uses input, namely business capital and Islamic cooperatives' assets and Sharia cooperative operations' remaining annual income as the output. The findings show that Sharia cooperatives in Aceh Province are not fully efficient. Several things can influence the efficiency level of Sharia cooperatives. One is that every Sharia cooperative unit in Aceh Province has not recorded reports properly and correctly. It is because Sharia cooperatives in Aceh Province are still relatively new. Therefore, it is necessary to increase efficiency in using good inputs and outputs to produce the efficiency of Sharia cooperatives in Aceh Province.

**Keywords:** efficiency; business capital; business assets; remaining income of operations; data envelopment analysis.



## 1. Introduction

Sharia cooperatives or known as Sharia Financial Services Cooperatives (KJKS) and Sharia Financial Services Units (UJKS), seem to be a fertile ground for growth and development during the economic development of a Muslim community, along with the raising of awareness and requirements on the management of a sharia-based economic system. The Sharia Savings and Loans and Financing Cooperative (KSPPS) or previously called the Sharia Financial Services Cooperative (KJKS), is part of the Baitul Mal wat Tamwil (BMT), which existed since the 1990s as a non-governmental organization (non-formal) in the field of Islamic microfinance, and currently providing more benefits to society. BMT experienced good growth dynamics as an Islamic financial institution in line with the dynamics and development of other Islamic economic and financial institutions in Indonesia. The emergence of various institutions based on Sharia principles is an interesting phenomenon to observe. The Islamic finance industry within the framework of Islamic financial institutions in a country's economy plays a crucial role, assisting business owners in running, expanding, and developing their business activities through financing.

The objective of Sharia cooperatives is to improve the welfare of members in particular and society in general and to participate in developing an economy based on Islamic principles (Hendra, 2016). Cooperatives consist of several forms, some of which are engaged in only one field, for example, in the field of production or are referred to as single cooperatives (single purpose), and cooperatives engaged in various fields such as multi-business cooperatives (multipurpose), e.g., sales and purchases (Mawarzani, 2019). Currently, there are 106 Sharia cooperative units in Aceh Province out of a total of 6,212 cooperatives listed (sourced from Aceh Province Office of Cooperatives and Small and Medium Enterprises in 2022). On the basis of data collected by the Aceh Province KUKM Office, as of September 2022, the development of sharia cooperatives in Aceh Province for the 2019-2022 period is as follows:

**Table 1.** Number of Sharia in Aceh Province in 2019-2022

| District(s)/Cities | Year(s) | | | |
|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2022 |
| Banda Aceh | 4 | 4 | 4 | 4 |
| Aceh Besar | 3 | 26 | 28 | 28 |
| Pidie | 0 | 0 | 2 | 2 |
| Pidie Jaya | 2 | 0 | 9 | 9 |
| Bireuen | 1 | 1 | 0 | 1 |
| Lhokseumawe | 0 | 0 | 9 | 9 |
| North Aceh | 2 | 2 | 3 | 2 |
| East Aceh | 0 | 0 | 0 | 0 |
| Langsa | 0 | 1 | 1 | 1 |
| Aceh Tamiang | 5 | 2 | 2 | 5 |
| Southeast Aceh | 0 | 0 | 4 | 4 |
| Gayo Lues | 0 | 0 | 1 | 1 |
| Central Aceh | 0 | 0 | 0 | 4 |
| Really Merry | 0 | 7 | 9 | 9 |
| Aceh Jaya | 0 | 1 | 1 | 1 |
| West Aceh | 1 | 1 | 3 | 3 |
| Nagan Raya | 0 | 2 | 4 | 5 |
| Southwest Aceh | 0 | 0 | 0 | 3 |
| South Aceh | 0 | 3 | 8 | 8 |
| Subulussalam | 0 | 0 | 0 | 0 |
| Aceh Singkil | 0 | 0 | 1 | 1 |
| Simeulue | 0 | 0 | 0 | 0 |
| Sabang | 0 | 0 | 0 | 2 |
| Province | 2 | 2 | 2 | 3 |
| Total | 20 | 51 | 89 | 106 |

Table 1 shows the development of Sharia cooperatives in Aceh Province and districts/cities. Aceh Besar District has 28 Sharia cooperative units, the majority among other districts/cities. However, several districts do not yet have a Sharia cooperative unit, including East Aceh District, Subulussalam District, and Simeulue District. Essentially, every cooperative that operates its daily business always needs working capital. As owner's equity capital is important, assets are also an important component for Islamic cooperatives. Assets are resources controlled by Sharia cooperatives due to past events/activities. From this, future economic benefits will be obtained by cooperatives that implement Sharia principles (Regulation of the Minister of Cooperatives and SMEs No. 14 of 2015). The proper use of assets is very important for an Islamic cooperative because, with enough assets owned, Islamic cooperatives can operate optimally in carrying out their operations.

Most of the research conducted on sharia cooperatives in Aceh Province focuses on the efficiency and effectiveness of working capital utilization (Rahman, 2017), analysis of financing on productivity (Mahmudah et al., 2020), and analysis of performance measurement of sharia cooperatives (Funna & Suazhari, 2019). Previous research on cooperatives focused more on discussing the financial efficiency of Islamic cooperatives (Badranaya, 2017), the role of cooperatives in the welfare of members (Ikbaludin,

2019), and the effect of working capital turnover and cooperative growth on profitability (Putra & Juliarsa, 2018). Limited research examines the efficiency of equity capital, assets and the remaining income of Islamic cooperative operations, especially in Aceh Province. Based on this background, this study aims to analyze the efficiency of Islamic cooperatives in Aceh Province.

## 2. Literature Review

### 2.1. Sharia Cooperatives

Law Number 17 of 2012 concerning cooperatives, states that a cooperative is a legal entity that works together to establish and run a business, each member of which provides capital to meet common needs that are realized in various economic, social, cultural, and implementation, process based on cooperative values and principles. Based on the law above, Sharia cooperatives are based on Pancasila and 1945, the Constitutional of Indonesia, and are based on the principle of kinship. Article four states that cooperatives aim to advance the welfare of members and society in general and build the national economic order to realize an advanced, just, and prosperous society based on Pancasila and the 1945 Constitution. The operational principle of cooperatives is the welfare of their members in the form of cooperation and mutual cooperation, which are emphasized in Islam, namely mutual assistance (Ta'awun alal birri) and collective (congregation) to increase self-sufficiency in life. With this in mind, there is a need to change the mindset regarding management procedures, types of products, and types of laws that are applied, and those that are enforced must follow Sharia principles (Buchori, 2009).

### 2.2. Efficiency

Kao (2016) stated that efficiency measurement displays past achievements and describes future development direction. According to Solikah (2010), cooperative efficiency is divided into three types, as seen from the ability of cooperatives to achieve the goal of increasing the welfare of members in particular and society in general, namely business management efficiency, development-related efficiency, and member-oriented efficiency. The simplest way to measure the efficiency of each cooperative unit is to calculate the ratio between UKE output with the factors of production used.

### 2.3. Cooperative Capital

According to Rahmatul et al. (2013), the amount of capital required by a cooperative is must already be determined in the process of organizing or at the time of its establishment with details of some fixed capital or also called long-term capital needed to provide physical facilities for cooperatives, such as purchasing of land, constructing buildings, machinery, and vehicle. Meanwhile, working or short-term capital is needed to finance cooperative operational activities such as salaries, purchasing raw materials, paying taxes and retirement premiums, etc. If the cooperative is a savings and loan cooperative, then capital is needed to provide loans to members. According to Law no. 25 of 1992 concerning cooperatives, article 41 states that cooperative capital consists of own and loan capital. Own capital can come from principal savings, mandatory savings, reserve funds, and grants. Meanwhile, loan capital can come from members, other cooperatives or their members, banks, and other financial institutions, issuance of bonds and other debt securities as well as other legitimate sources.

### 2.4. Remaining Income of Operations (SHU)

According to Sapoetra (2013), the remaining operating income is cooperative earned for one financial year after deducting the depreciation and costs of the relevant financial year. The reasonable profit earned covers all business expenses, such as employee salaries, office, warehouse, transportation, and other operational costs. According to Winarko (2014), in order to reflect the principles of justice, democracy, and transparency and the principles of cooperatives, it is necessary to pay attention to the principles of sharing the remaining income of operations, that is, a distribution of remaining income is sourced from members, the remaining income of business members are services from capital and business transactions carried out by the members themselves, the distribution of the remaining business income of the members is carried out transparently, and the remaining business income of the members are paid in cash.

### 2.5. Cooperative Assets

Elsafiani, (2022) stated that assets in cooperatives are wealth obtained in the development of cooperatives obtained from financial management which is entrusted by members or customers and is also a process of developing deposits in the form of cash used to finance the purchase or other activities carried out by customers with sharia concepts. So that in its rotation, sharia cooperatives pay attention to various financing that must be issued which are agreed upon by all members in a cooperative meeting. So that the amount of financing and how the process for the financial turnaround of the cooperative is determined directly by deliberation and still avoids usury. According to Elsafiani, (2022), wadiah savings have a positive effect on total assets with a determination coefficient of 95.3% and futures mudharabah has a partially positive insignificant effect with a determination coefficient value of 55.9%, but overall, the effect of wadiah deposits and futures mudharabah has a significant positive effect based on the calculation of the coefficient of determination of 95.8% with another effect of 4.2%.

## 3. Materials and Methods

### 3.1. Materials

This study analyzes the level of efficiency of Islamic cooperatives in Aceh Province. The variables used are in the form of *input,* which is Islamic cooperative capital, Islamic cooperative assets, and variables *output,* namely the remaining net income of Sharia cooperative operations. The data used is in the form of annual data for 2020-2022 in 23 districts/cities in Aceh Province. Cooperative capital is the number of funds owned by cooperatives in the financial year. Capital sourced from reports on Sharia operations in Aceh Province for 2020-2022, which are calculated in rupiah units. Cooperatives own cooperative assets and have a beneficial value for Sharia Cooperatives in 2020-2022, calculated in rupiah units. And the remaining operation's income is the profit (surplus) generated from cooperatives' production. The remaining operating income is the difference between all the total income or receipts of the cooperative and all costs, depreciation, and other obligations in 2020-2022 which are calculated in units of rupiah. Data was collected from the Aceh Cooperatives and Small and Medium Enterprises Office.

### 3.2. Methods

The data analysis method used in this study is data envelopment analysis (DEA) to measure relative efficiency. The DEA method is a form of a mathematical programming technique that is used to evaluate the relative efficiency of a collection of decision-making units in managing resources (inputs) of the same type into results (outputs) of the same type, where the function relationship from input to output not known. The model used in the DEA method is the model constant return to scale (CRS) and model variable return to scale (VRS). Comparing output and input from the unit observed to the unit of the organization to determine a relatively efficient unit as a best practice, a reference for units that are not yet efficient. This method is suitable for analyzing the efficiency of cooperatives. There are two equations used in this study, including the equations for the CRS model and the VRS model. According to (Wulandari, 2019), the CRS model assumes that the ratio between additions *input* and *output* is the same. The CRS model equation is written as follows:

$$Min_{\theta\lambda}\ \theta \text{ subject to } \begin{array}{l} -y + Y\lambda > 0, \\ \theta_{xi} - X\lambda \geq 0, \\ \lambda > 0 \end{array} \quad (1)$$

or it can be written in the mathematical modeling as below:

$$St = -y_{15}\left(y_1\lambda_1 + y_2\lambda_2 + y_3\lambda_3 + \ldots + y_{16}\lambda_{16}\right) \geq 0 \quad (2)$$

$$St = \theta x_{115} - \left(x_{11}\lambda_1 + x_{12}\lambda_2 + x_{13}\lambda_3 + \ldots + x_{16}\lambda_6\right) \geq 0 \quad (3)$$

$$St = \theta x_{215} - \left(x_{21}\lambda_1 + x_{22}\lambda_2 + x_{23}\lambda_3 + \ldots + x_{26}\lambda_{16}\right) \geq 0 \quad (4)$$

$$\lambda \geq 0$$

The VRS model assumes that the ratio between additions *input* and *output* inequal, the VRS model equation is written as follows:

$$Min_{\theta\lambda}\ \theta \text{ subject to } \begin{matrix} -y + Y\lambda > 0, \\ \theta_{xi} - X\lambda > 0, \\ \lambda > 0 \end{matrix} \quad (5)$$

$$St = -y_{15}\left(y_1\lambda_1 + y_2\lambda_2 + y_3\lambda_3 + ... + y_{16}\lambda_{16}\right) \geq 0 \quad (6)$$

$$St = \theta x_{115} - \left(x_{11}\lambda_1 + x_{12}\lambda_2 + x_{13}\lambda_3 + ... + x_{116}\lambda_6\right) \geq 0 \quad (7)$$

$$St = \theta x_{215} - \left(x_{21}\lambda_1 + x_{22}\lambda_2 + x_{23}\lambda_3 + ... + x_{26}\lambda_{16}\right) \geq 0$$
$$\lambda \geq 0 \quad (8)$$

Y is *output* which is used, X is *input* is used and λ is a constant and $Min_{\theta\lambda}\ \theta$ is an efficiency DMU model. This study classifies the efficiency level into five categories, very inefficient, inefficient, less efficient, efficient, and very efficient. An efficiency level of 100% or (EFF=1) is considered very efficient, while an efficient level of 0% or (EFF=0) is considered very inefficient. The efficiency level category is explained in Table 2:

**Table 2.** Efficiency Level Category

| Efficiency Levels | Category |
|---|---|
| 0.00 – 0.20 | I = Very Inefficient |
| 0.21 – 0.40 | II = Inefficient |
| 0.41 – 0.60 | III = Less Efficient |
| 0.61 – 0.80 | IV = Efficient |
| 0.81 – 100.00 | V = Highly Efficient |

# 4. Results

## 4.1. Descriptive statistics

This study uses secondary data from the total capital of Islamic cooperatives, the total assets of Islamic cooperatives, and the remaining operating income of Islamic cooperatives in the 2020-2022 period. The results of the Descriptive Statistics analysis are as follows:

**Table 3.** Descriptive statistics

| | Assets | Modal | Remaining Business Results |
|---|---|---|---|
| Mean | 5.664.668 | 19.202.878 | 20.097.924 |
| Median | 2.278.835 | 1.470.830 | 1.059.387 |
| Maximum | 49.911.977 | 29.851.964 | 9.625.948 |
| Minimum | 0 | 0 | 0 |
| Std. Dev. | 11.170.425 | 60.240.084 | 105.412.282 |

Table 3 indicates the highest input for Sharia Cooperative assets in Aceh Province is IDR 49,911,977 in Aceh Besar District and for the capital of IDR 29,851,964 in the City of Banda Aceh. Meanwhile highest output for the remaining operating income of IDR. 9,625,948 in Aceh Tamiang District. The highest number of Sharia cooperative members in Aceh Province is 3,148 members in Pidie Jaya District and the lowest is

zero or no cooperative members in 2022 in Aceh Besar, Pidie, Pidie Jaya, Lhokseumawe, Gayo Lues, Central Aceh, and Southeast Aceh districts. With an average number of members of sharia cooperatives in Aceh Province is 530 members. The highest volume of sharia cooperative business is IDR. 21,589,404 in Pidie Regency and the lowest is zero rupiahs in several districts. With an average volume of sharia cooperative business in Aceh Province, which is IDR. 4,302,323.

## 4.2. Efficiency Analysis

This study measures and analyzes the efficiency of sharia cooperatives in Aceh Province during the 2020-2022 period. Table 4 is the result of the CRS and VRS model of efficiency level. A value of 1 means that the Islamic cooperative is efficient, while a value smaller than 1 indicates that it is not efficient. The average efficiency in 2020 uses the CRS model, which is 0.041 or 4.1% in the very inefficient category and VRS is 0.134 or 13.4% in the very inefficient category. In 2021 the average efficiency using the CRS model is 0.221 or 22.1% in the inefficient category and the VRS model is 0.264 or 26.4% in the inefficient category. And finally, in 2022 the average efficiency using the CRS model is 0.215 or 21.5% in the inefficient category and using the VRS model 0.278 or 27.8% in the inefficient category. Every year, the efficiency level of Islamic cooperatives using the CRS and VRS models continues to increase. However, the increase is not likely to be high.

**Table 4.** (a) The level of efficiency of Islamic cooperatives in 2020

| DMU | Efficiency Level | | Category Level | |
|---|---|---|---|---|
| | CRS | VRS | CRS | VRS |
| 1 | 0.24542 | 0.24611 | I | II |
| 2 | 0.00309 | 0.35122 | I | II |
| 3 | 0.00175 | 0.05543 | I | II |
| 4 | 9.4E-05 | 0.00341 | I | II |
| 5 | 0.00012 | 0.00260 | I | II |
| 6 | 0.00017 | 0.00220 | I | II |
| 7 | 0.00129 | 0.00291 | I | II |
| 8 | 0.00960 | 0.08437 | I | II |
| 9 | 0.254045 | 0.25404 | II | II |
| 10 | 0.000086 | 0.051770 | I | II |
| 11 | 0.000242 | 0.071800 | I | II |
| 12 | 0.147890 | 0.240840 | I | II |
| 13 | 0.000517 | 0.002200 | I | I |
| 14 | 0.000010 | 0.002120 | I | I |
| 15 | 0.000182 | 0.388990 | I | II |
| 16 | 0.000933 | 0.388990 | I | II |
| Mean | 0.04158 | 0.13431 | I | I |

**Table 5.** (b) The level of efficiency of Islamic cooperatives in 2021

| DMU | Efficiency Level | | Category Level | |
|---|---|---|---|---|
| | CRS | VRS | CRS | VRS |
| 1 | 0.569575 | 0.58984 | III | III |
| 2 | 1.000000 | 1.00000 | V | V |
| 3 | 0.296068 | 0.39092 | II | II |
| 4 | 0.038809 | 0.23308 | I | II |
| 5 | 0.007212 | 0.00721 | I | I |
| 6 | 0.063936 | 0.06793 | I | I |
| 7 | 0.143527 | 0.14339 | I | I |
| 8 | 0.009595 | 0.08437 | I | I |
| 9 | 0.254045 | 0.25404 | II | II |
| 10 | 0.006517 | 0.175820 | I | II |
| 11 | 0.023870 | 0.045660 | I | II |
| 12 | 0.147890 | 0.024080 | I | II |
| 13 | 0.000517 | 0.002200 | I | I |
| 14 | 0.112484 | 0.112480 | I | I |
| 15 | 0.097117 | 0.097180 | I | II |
| 16 | 0.774829 | 1.000000 | IV | V |
| Mean | 0.221625 | 0.26429 | II | II |

**Table 6.** (c) The level of efficiency of Islamic cooperatives in 2022

| DMU | Efficiency Level | | Category Level | |
|---|---|---|---|---|
| | CRS | VRS | CRS | VRS |
| 1 | 0.569575 | 0.58984 | III | III |
| 2 | 1.000000 | 1.00000 | V | V |
| 3 | 0.371977 | 0.38632 | II | II |
| 10 | 0.006517 | 0.01758 | I | I |
| 11 | 0.184930 | 0.184930 | I | I |
| 12 | 0.014789 | 0.240840 | I | II |

| DMU | Efficiency Level | | Category Level | |
|---|---|---|---|---|
| | CRS | VRS | CRS | VRS |
| 4 | 0.000357 | 0.22995 | I | II |
| 5 | 0.001186 | 0.00351 | I | I |
| 6 | 0.063513 | 0.06351 | I | I |
| 7 | 0.143527 | 0.14390 | I | I |
| 8 | 0.000960 | 0.08437 | I | I |
| 9 | 0.004100 | 0.04555 | II | II |
| 13 | 0.005174 | 0.220390 | I | II |
| 14 | 0.114003 | 0.114000 | I | I |
| 15 | 0.132108 | 0.132111 | I | I |
| 16 | 0.833506 | 1.000000 | V | V |
| Mean | 0.215388 | 0.27855 | II | II |

Table 4 (a), (b) and (c) show the estimation results of the CRS and VRS models, sharia cooperatives in Aceh Province tend to be low and not efficient. Most of sharia cooperatives in districts/cities have not recorded a complete annual report. And the low level of efficiency of sharia cooperatives may be caused by the newly formed sharia institutions so there are still only a few cooperatives in Aceh Province that are already implemented sharia principles. Otherwise, by implementing sharia cooperative governance is supported by professional human resources and adequate funds. Thus, sharia cooperatives need to maintain and improve their management continuously. The results of this study support the results of a similar study conducted by Anggreni & Agustiani, (2021) that showed the greatest cooperative efficiency lies in the variable output, namely the Remaining Income of Operations. While variables input, namely capital, management costs, and the number of managers, is below 100%.

The low-efficiency level of Islamic cooperatives in Aceh Province is not surprising. Due to their small scale, Islamic cooperatives tend to be more vulnerable to economic turmoil. In addition, a business culture that still uses traditional and low managerial culture impacted the sharia cooperative's productivity and efficiency level (Ropke, 1992). Thus, further efforts should be made to increase the efficiency level of the cooperative. Improving Sharia cooperatives' administration and entrepreneurship skills through providing continuous certification training might be a solution. Sharia cooperatives must also adopt new technology and be relevant to support daily business activities. The government must review its policies to advance cooperatives in all districts/cities. Enforcement of Islamic cooperative laws ensures the compatibility of Islamic cooperatives with existing Islamic cooperative principles and rules to increase the efficiency of Islamic cooperatives. And the private economic sector must be encouraged to support Sharia cooperative business activities.

## 5. Conclusions

This study concludes that efficiency levels cannot be measured with just one model. It is because the CRS and VRS models have different results. Sharia cooperatives' efficiency level in Aceh Province is still not fully efficient. It can be caused by several things, one of which is that every Sharia cooperative unit has not recorded a complete annual report, and Sharia cooperatives in Aceh Province are still newly implemented. It is suggested that Sharia cooperatives in Aceh Province should apply the principles of good governance and adopt e-marketing in their business activities. Fostering the management of sharia cooperatives properly by providing training to be more skilled and professional. The government must review its policies to promote Sharia cooperatives in all districts/cities. The government must also ensure that all Sharia cooperatives conform to existing principles, rules, and regulations to ensure the sustainability of existing programs in Sharia cooperatives. And the private sector of the economy may also support Islamic cooperative activities. For future research, it may be possible to explore performance in various sectors of Islamic cooperatives in Indonesia, especially in Aceh Province, to offer a better picture describing performance nationally. Then, combining parametric and non-parametric approaches to measure the level of efficiency of Sharia cooperatives can expand existing research to help realize cooperatives as pillars of Indonesia as mandated by Article 33 of the Constitution of 1945.

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