

## SHARIA AND CONVENTIONAL BANKING EFFICIENCY (COMPARATIVE STUDY WITH DATA ENVELOPMENT ANALYSIS METHOD)

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**Abstract:** One of the measuring tools in monitoring the financial performance of a banking unit is efficiency. This research which aims to see whether there is a difference in the level of efficiency takes data from Islamic banking and conventional banking listed on the IDX (Indonesia Stock Exchange). Determination of the sample by purposive sampling method. Of the 100 data taken, consisting of 5 BUK, 5 BPR, 5 BUS and 5 BPRS in 2012-2016. By using Data Envelopment Analysis (DEA) the efficiency value of the data is obtained. The results of the data analysis show that Islamic banking is more efficient than conventional banking. This is indicated by the large number of conventional banks that do not achieve the targeted efficiency.

**Keywords:** *Efficiency, Data Envelopment Analysis (DEA), Islamic Commercial Banks, Conventional Commercial Banks, BPR, BPRS*

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### INTRODUCTION

Law No. 10 of 1998, an amendment to Law No. 7 of 1992, explains the definition of banking, namely a business entity that accommodates funds from the public in the form of deposits and distributes them again in the form of credit and or other banking products, with a function to improve the welfare of the community as customers. In Indonesia, there are two types of banks based on the determination of interest or profit sharing, namely conventional banking and Islamic banking. Conventional banks can open sharia branches or can convert themselves as Islamic banks in accordance with the rules written in Law No. 10 of 1998. The government also supports the latest regulations for Islamic banking as outlined in Law no. 21 of 2008. The emergence of these regulations, qualitatively Islamic business finance has developed very well (Sutawijaya & Lestari, 2009).

Conventional Financial Institutions and Islamic Financial Institutions have differences in collecting and returning customer profits to financial institutions and vice versa (Karsono et al., 2017). Not all practices in Islamic banking use a profit-sharing system. There is a system of buying and selling and leasing that can be used in the performance system of an Islamic bank (Ramadhani, 2019). Banks operating in Indonesia, whether conventional or sharia, can cause problems in society. Problems that often arise in the community are the quality of performance and the health condition of the banking system itself. For this reason, an assessment of banking efficiency is needed to determine the performance of the bank. In addition, banking efficiency can be used as an indicator in minimizing risks that may occur in banking operations itself (Muttaqin et al., 2020).

The condition of the Islamic banking system in Indonesia in terms of quantity and quality is always developing. The increasing number of offices and their distribution are very visible. Meanwhile, in terms of the quality level, it can be seen from the performance which is increasingly showing changes for the better (Wahab, 2015). The performance target of Islamic banking has not been fully achieved. Indicators such as total assets, financing, and TPF are still far below (Karsono et al., 2017). Bank Indonesia provides data in 2000-2005 that the condition of Islamic banking has good potential because the majority of the population is Muslim and the development of Islamic financial institutions is growing rapidly.

Bank efficiency is needed to measure the good and bad performance of a financial institution, including Islamic banking and conventional banking. Indicators that can be measured are technical efficiency, financial allocation and economic flow. On this occasion, the researcher will only analyze the efficiency of the technique, therefore using the DEA (Data Envelopment Analysis) approach.

### **Research Purposes**

The purpose of this study is to determine the efficiency value of Islamic banking and conventional banking in Indonesia and then analyze the efficiency comparison between conventional banking and Islamic banking.

### **LITERATURE REVIEW**

There is a fundamental difference between Islamic banking and conventional banking, namely in the collection of funds and the return of profits given by customers to financial institutions and vice versa (Karsono et al., 2017). An important aspect to measure banking performance is efficiency. A high level of efficiency will show good performance quality (Amirillah, 2014). The DEA (Data Envelopment Analysis) method is one approach that can be used to calculate the efficiency value of all banks. The scoring of the relative efficiency value of Data Envelopment Analysis depends on the efficiency value of each bank unit in the sample used. Factors that cause less efficiency from a bank unit can also be analyzed using Data Envelopment Analysis (Wahab, 2015).

The DEA approach basically measures the ratio of input and output data from a bank which is taken for the DMU (Decision Making Units) data sample where the input and output data from the DMU are at the same level. The following is the general equation of the DEA approach (Muttaqin et al., 2020)

$$h_s = \frac{\sum_{i=1}^m u_{is} y_{is}}{\sum_{j=1}^n u_{js} x_{js}}$$

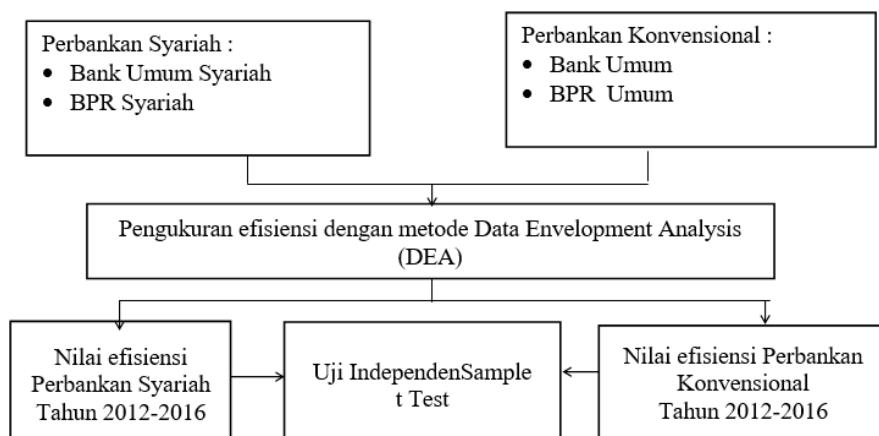
Calculation with the DEA approach by calculating the value of  $h_s$ , where  $h_s$  shows the efficiency value of each bank unit in a certain period;  $u_{is}$  is the output data  $i$  generated;  $y_{is}$  is the input data  $i$  obtained;  $v_{js}$  is  $j$  input data;  $x_{js}$  represents the input of  $j$  given by the unit of an  $s$ -bank.

Banking efficiency can be analyzed using scale efficiency (Scala Efficiency), technical efficiency (Technical Efficiency), and location efficiency (Allocative Efficiency). A bank unit is said to be efficient when the bank concerned can operate on a constant scale (constant return to scale) and the scope of efficiency itself is achieved if a bank unit is able to operate in a certain location. Efficiency of a location can be achieved if the output of a bank is able to maximize profits, while technical efficiency depends on the relationship between inputs and

outputs. The output produced with the maximum amount using the minimum input (Setyono et al., 2021).

The analytical tool used in this research is nonparametric, with a Data Envelopment Analysis (DEA) approach. DEA will calculate the technical efficiency for all selected bank units to be sampled (Ramadhani, 2019). CCR and BCC are types of existing DEA models. In 1978 Charnes, Coper and Rhodes created the CCR method to assume that there is a Constant Return to Scale (CRS), i.e. a proportional change between output and input (for example, if there is an increase of 1% of input, there will be an increase of 1% of output). In 1984, Bankers, Charoes and Coper developed it into a BCC model with the assumption of a VRS (Variable Return to Scale) variable. Each measured unit will produce a change in each of its outputs and is considered to be able to affect the level of efficiency is the assumption of VRS (Variable Return Scale).

In this study, the author only applies the output approach with the assumption of CRS because it can be seen that the amount of output generated from the input is the same between units with a proportional comparison. Furthermore, hypothesis testing using independent sample t-test statistical test. While the normality test to take one of two different types of tests. This test is used as a condition for the parametric statistical test with normal distribution.



**Image 1**  
**Research design**

## **RESEARCH METHODOLOGY**

The secondary data used in this research is in the form of financial statements in the form of balance sheets and banking income statements at IDX from 2012-2016. Islamic banking (Islamic Commercial Banks and BPRS) and conventional banking (Conventional Commercial Banks and BPR) are the population of this study. Then the sample is determined by purposive sampling technique. Bank Rakyat Indonesia Syariah, Bank Muamalat Indonesia, Bank Syariah Mandiri, BNI Syariah and Bank Syariah Bukopin are Islamic Commercial Banks selected by the authors in this study. Furthermore, BPRS consists of BPRS Amanah Rabbaniyah, BPRS Hareukat, BPRS Amanah Ummah, BPRS Musyarakah Ummat Indonesia and BPRS Bina Amwalul Hasanah. Conventional Commercial Banks selected by the authors include Bank Rakyat Indonesia, Bank Mandiri, Bank Central Asia, Bank Negara Indonesia and Bank CIMB Niaga.

The input variables are all assets, savings and labor costs written in the financial statements. The output variable is total credit or financing and all operating profit obtained.

The first hypothesis is that there is a difference in efficiency values between Islamic banking and conventional banking and the second hypothesis is that Islamic banking is more efficient than conventional banking.

The data used are 100 respondents so that the number is greater than the number 60, making research using the normality test used, namely the Kolmogorof-Smirnov.

**Table 1**  
**Kolmogorof-smirnov . Normality Test Results**

Test Statistics <sup>a</sup>		Efisiensi
Most Extreme Differences	Absolute	.120
	Positive	.120
	Negative	-.080
Kolmogorov-Smirnov Z		.600
Asymp. Sig. (2-tailed)		.864

a. Grouping Variable: Tipe Bank

Source: processed data

From the table, it is shown that the value of sig (0.864) > 0.05 means that the data is normally distributed, therefore the t-test is used to test the hypothesis.

**Table 2**  
**Test Results t-test**

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Efisiensi	Equal variances assumed	6.823	.010	-1.426	98	.157	-4.9086	3.44253	-11.74020	1.92300
	Equal variances not assumed			-1.426	73.937	.158	-4.9086	3.44253	-11.76810	1.95090

Source: processed data

From table 2, it can be seen that the value of sig (0.010) is greater than 0.05, so  $H_0$  is rejected. This means that there is a difference between the efficiency value of Islamic banking and conventional banking. From the 95% significance level ratio, it shows that the value of the efficiency of Islamic and conventional banking is between -11.74 to 1.92.

**Table 3**  
**Descriptive Statistics**  
**Group Statistics**

Tipe Bank	N	Mean	Std. Deviation	Std. Error Mean
Bank Konvensional	50	85.4246	21.57076	3.05057
Bank Syariah	50	90.3332	11.28071	1.59533

Source: processed data

Table 3 can be seen that the mean value of conventional banking is (85.4246) and Islamic banking (90.333). This means that the mean value of Islamic banking is greater, so it can be concluded that Islamic banking has a higher efficiency value than conventional banking, although the difference shown is not too far away.

## **RESULTS AND CONCLUSIONS**

Thus, it can be concluded. First, the efficiency level of ten Islamic banks and ten conventional banks studied with the Data Envelopment Analysis (DEA) approach for the period 2012-2016 reached a relatively good value. Second, the efficiency value of Islamic banking is more efficient than conventional banking. This is indicated by the number of conventional banks that have not reached maximum efficiency. Third, there is a difference in efficiency between Islamic banking and conventional banking, indicated by evidence of the value of sig (0.010) < 0.05, so  $H_0$  is rejected.

From the conclusions above, it can be given an implication in which practically the management of banking, both sharia and conventional, can improve financial performance for the better based on the variables in this study. For the government, especially for banks that have not been maximally efficient, they must continue to be given the best regulations and be given the opportunity to carry out socialization and promotions. Theoretically for the academic community in further research, it can be studied by adding related variables, both input and output variables.

## **BIBLIOGRAPHY**

- Amirillah, A. (2014). Efficiency of Islamic Banking in Indonesia. *TRACK: Journal of Economics and Policy*, 7(2). <https://doi.org/10.15294/jejak.v7i2.3895>
- Karsono, LDP, Imronudin, SEM, & Wajdi, MF (2017). Comparative Analysis of Islamic Banking Efficiency and Conventional Banking with Data Envelopment Analysis (DEA) Method. <http://eprints.ums.ac.id/id/eprint/59106>
- Muttaqin, I., Rini, R., & Fatriansyah, AIA (2020). Efficiency of Islamic Commercial Banks in Indonesia with a Three Stages Frontier Approach. *Journal of Islamic Accounting and Finance*, 8(2), 115–130.
- Ramadhani, MY (2019). ANALYSIS OF PROFITABILITY DETERMINANTS OF SHARIA COMMERCIAL BANKS IN ASEAN (INDONESIA, MALAYSIA, BRUNEI DARUSSALAM) 2013-2017 THESIS.
- Setyono, F., Istiqomah, YNA, Sainsndhita, S., & Mujib, A. (2021). Analysis of Islamic Banking Efficiency During the Covid-19 Pandemic Using Data Envelopment Analysis (DEA). *I-Finance: A Research Journal on Islamic Finance*, 7(1), 11–30. <https://doi.org/10.19109/ifinance.v7i1.8434>
- Sutawijaya, A., & Lestari, EP (2009). EFFICIENCY OF INDONESIAN BANKING ENGINEERING POST ECONOMIC CRISIS: AN EMPIRE STUDY OF THE APPLICATION OF THE DEA MODEL. *Journal of Development Economics*, 10(1), 49–67.
- Wow. (2015). ANALYSIS OF FACTORS AFFECTING THE EFFICIENCY OF SHARIA COMMERCIAL BANKS IN INDONESIA WITH TWO STAGE STOCHASTIC FRONTIER APROACH (Analytical Study at Islamic Commercial Banks).