Determinant Analysis of Sharia Banking Efficiency in Indonesia

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Abstract— **The purpose of this research is to measure the level of sharia banking efficiency in Indonesia period 2010-2017. The samples used in this study were 8 sharia banks in Indonesia. The method used in this research consists of two stages, which it begins by measuring the efficiency level with the data envelopment Analysis (DEA Furthermore, DEA results are regressed by using Data Panels with Random Effect models to determine the factors that affect efficiency with financial indicators SIZE, CAR , FDR, NPF, BOPO which are processed using STATA. The results of the study can be concluded that the SIZE and CAR variables have a positive effect but are not significant, the FDR variable is positive and significant, while the NPF and BOPO variables are influential and significant to the efficiency**

Keywords—efficiency; SIZE; CAR; FDR; NPF; BOPO

I. INTRODUCTION

Banking became the main thing in measuring the country's economic growth. The banking sector as a sub-systems in a country's economy has a fairly important role. Even in the life of modern society everyday, most of them almost involve the services of the banking sector [1]. Banks with its intermediate function can raise funds from the community in various forms of deposits. Further from the accumulated funds, the bank redistributed in the form of giving credit to the business sector or other parties in need. The growing community life and transactions of the economy of the country, will also require an increase in the role of the banking sector through the development of services products [2]

In Indonesia, banking is classified as two, namely Sharia banks and conventional banks. But along with the development of Indonesian banking, now appears dual banking system, which is conventional banking that has the Sharia business unit. The emergence of Sharia banking is expected to encourage and accelerate the economic progress of a community in conducting banking activities, in accordance with the principles of Islamic.
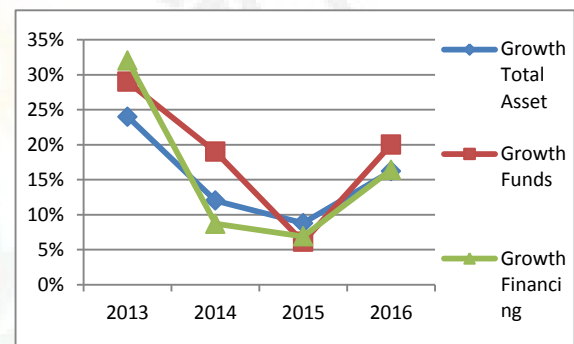

Fig. 1. Sharia banking financial indicators development year 2013-2016

Slowing the financial growth of Sharia banking is caused by unstable economic conditions, Judging from the figure 1 that the growth of total assets, third party funds and financing tends to continue to decline from the year 2013 to 2015 and start improving in 2016.

The good indicator of Sharia bank performance is the number of assets, which during the 2013-2016 period of the sharia banking asset is slowing down the amount of financing distributed to the public. In this case, the sharia banking industry is increasingly reviewing the financing that has been and that will be given. Management performs control and repairs the quality of financing to reduce the occurrence of problematic financing. The financing of the problem is seen in the NPF (non performing finance) Sharia banking industry in 2015 which reaches 4.93%, almost touching the maximum limit of NPF which is assessed healthy by BI is a maximum of 5%. The high NPF ratio causes Sharia banking to provide more capital reserves to cover the amount of financing that has been problematic. On the other hand the Financing Deposit ratio (FDR) was decreasing from the previous year.
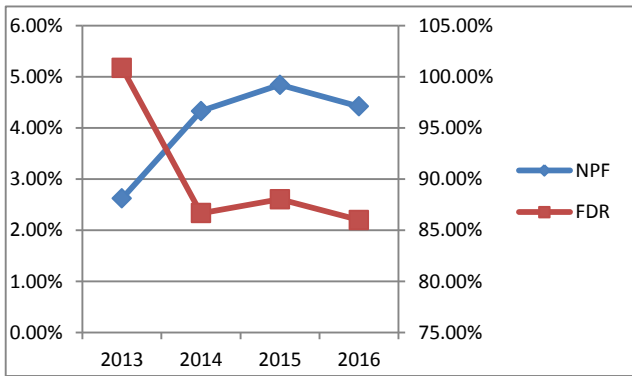
Figure 2. Development of NPF and FDR Sharia banking 2013 – 2016

Instability of domestic and global economic conditions also give effect to the development of non-performing finance and financing to deposit ratio. In 2013 there were 2.62% Non-performing finance (NPF) on both BUS and UUS. This percentage is still said to be quite normal, before increasing in the years 2014 and 2015 by 4.33% and 4.84% that almost touched the maximum limit of 5% stipulated by Bank Indonesia. In 2016 non-performing finance conditions decreased to 4.42%, but the magnitude is still categorized large enough for problematic financing.

Also can be seen the development of financing deposit ratio (FDR) from year 2013-2016 on the chart above. FDR as a picture of Sharia bank liquidity is good enough in the year 2013 for 100.86%. Then, due to the global economic turmoil that affected the economic growth of Indonesia, especially the banking sector, there was a decline in FDR in 2014 (86.66%), increased 2015 (88.03%) And there was a decline back in 2016 to 85.99%. In addition to external factors, namely the development of domestic and global economies, the decline in the FDR implies that the performance of Sharia banks and Sharia unit enterprises has not been optimal in carrying out their functions as intermediation agencies in the distribution Financing to the community. Financial ratios such as Non performing Finance (NPF) and Financing deposit ratios can indicate the quality of Sharia banking performance.

II. LIERATURE REVIEW

The concept of efficiency was first introduced by Farrrel When measuring efficiency empirically. According to the efficiency of the company consists of two components, namely technical efficiency and alocative efficiency. Technical efficiency reflects the capability of the company in generating output with a number of inputs available. While the alokative efficiency reflects the company's ability to optimize its input, its price structure and production technology. Both sizes are then combined into economic efficiency. [3]

According to Muhamad Nadratuzzaman Hosen & Rafika Rahmawati (2014) Categorizes the level of efficiency of a bank in the category as described in the table below. [4]

TABLE 1. CATEGORY OF BANK

Efficiency levels	Efficiency levels	Categories
< 65%	Inefisien	0
65-85%	Low efficiency	1
86-96%	Intermediate efficiency	2
97-100%	High efficiency	3

According Silkman, There are three types of efficiency measurement approach, especially banking, namely: 1. Ratio approach 2. Regression approach 3. Frontier approach [5] The frontier approach in measuring efficiency is differentiated into two types, namely parametric and non parametric frontier approaches. The parametric frontier approach can be measured by parametric statistical tests such as using the Stochastic Frontier Approach (SFA), the Thick Frontier Approach (TPA) and the Distribution Free Approach (DFA). The Nonparametric frontier approach is measured by non-parametric statistical tests using the Data Envelopment Analysis (DEA) method. Parametric statistical tests take into consideration the type of spread or distribution of data, the model stipulates the presence of certain conditions of the population parameter that is the source of its research. While Non-parametric statistics are tests whose models do not specify a terms that is about the population parameters that are the parent of the research samples. In this research researchers use a non parametric frontier approach.

The non parametric frontier approach used in this research is an intermediate approach. According to Berger and Humphrey, [6] The intermediation approach is a more precise approach to evaluating the performance of financial institutions generally because of the characteristics of financial institutions as financial intermediations Raise funds from the unit surplus and distribute it to the deficit unit. Using this intermediate approach is also expected to describe the real banking function. According to the Molyneux, [7] The intermediation approach is superior to evaluating the efficiency frontier in financial institutions ' profitability. Because it minimizes the total cost and not just the production cost, it is necessary to maximize the profit.

Technical efficiency measurements tend to be limited to technical and operational relationships in the input conversion process into output. The effort to improve technical efficiency requires only internal micropolicy, namely with optimal control and allocation of resources. A company is said to be technically efficient when generating maximum output with certain resources or producing a certain amount of output using minimal resources. The efficiency of a company is measured by the capability of generating output at minimum

or maximum cost of profit. The Issue of technical efficiency (TE) is the ability to make decisions to produce output from a set of inputs (output oriented) or to output using the lowest input amount (input oriented) where an example is the quality of the workforce identified as inputs in output production for economic growth [8]. Banking technical efficiency is measured by calculating the ratio between outputs and banking inputs. The DEA (Data Envelopment Analisys) will calculate the bank using the input n to produce a different m output.

$$\varepsilon_S = \frac{\sum_{i=q}^{m} u_i Y_{is}}{\sum_{j-1}^{n} V_J X_{js}}$$

es : Efficiency of Bank techniques s
Yis : Number of outputs I produced by the bank s
Xjs : Number of J inputs used by the bank s
Ui : The output weights I generated by the bank s
Vj : The J input weight provided by the bank s, and Count from 1 to M and counted from 1 to n

The equation above indicates the use of one input variable and one output. Ratio of efficiency (tests), then maximised with constraints as follows:

$$\frac{\sum_{i-q}^{m} U_I Y_{ir}}{\sum_{j=1}^{n} V_J X_{JR}} \leq 1$$

For r = 1

Ui and Vj e"O

Where n indicates the number of banks in the sample. The first inequality indicates the presence of the company's efficiency ratio of no more than 1, while the inequalities of the second positive weighted ratio numbers will vary between 0 and 1. A bank is said to be efficient when having a ratio number approaching 1 or 100%. Conversely if approaching 0 indicates lower bank efficiency or inefficiencies occur. With the help of the Frontier Analysis Application program, the level of efficiency is calculated based on available data.

The Result of Nadiah Hidayati's research about determinant of Islamic Indonesian banks, Sharia Bank (BUS) and Sharia Unit Enterprises (UUS) in Indonesia are technically not fully operational efficiently. Secondly, the financing and CAR variables have a positive and significant impact BUS and UUS efficiency levels. Thirdly, wadiah deposits have significant negative To BUS and UUS efficiency in Indonesia. [9]

A. Hypotheses

Referring to the foundation of the theory and previous research, it can be derived hypothesis as follows:
1. Sharia banking efficiency in Indonesia is still relatively low

2. There are factors SIZE, CAR, FDR that positively affect the value of efficiency in Sharia banking. While the NPF and BOPO negatively affect the value of Sharia banking efficiency.

B. Research design

Based on the research hypothesis, the research design can be described and made the regression equation as follows:
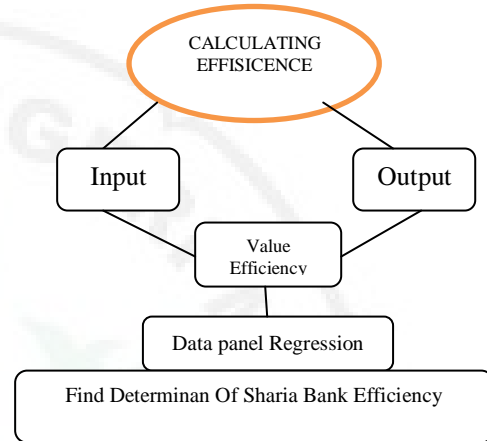

Fig. 3. Design Method

III. RESEARCH METHODS

The population used in this study is sharia banking consisting of 13 sharia banks, 21 Sharia unit businesses. The samples used in this study were determined by purposive sampling techniques: 4 Government Sharia banks and 4 private sharia banks, where both government and private Sharia banks were the largest unit of sharia banking. So that it can describe the actual financial condition of any bank.

TABLE 2. NAME AND CODE OF SAMPLE BANK RESEARCH

	Name of Bank	Code of bank
Government Banks	Bank Muamalat	1
	Bank Mandiri Syariah	2
	BNI Syariah	3
	BRI Syariah	4
Private Bank	BCA SYARIAH	5
	Bukopin Syariah	6
	Bank Mega Syariah	7
	Panin Bank Syariah	8

The method of data analysis used in this research is a quantitative analysis expressed by numbers and calculations using statistical methods. The study consisted of two phases. At the first stage, the level of efficiency in each bank is estimated using Data Envelopment Analysis and in the second step is to test the determination of Sharia banking efficiency in Indonesia is estimated using the data panel regression

To answer the second hypothesis used a double linear analytable method with the processing technique of data panels. The analytical models developed are:

$$Effi_{it} = \beta_{0it} + \beta_1 Size_{it} + \beta_2 NPF_{it} + \beta_3 BOPO_{it} + \beta_4 CAR_{it} + \beta_5 FDR_{it} + \varepsilon it$$

Effi = Efficiency
Size = Total assets
NPF = Non Performing Financing
BOPO= Operational expenditure on operational income
CAR = Capital adequacy ratio
FDR = Financing deposit ratio
ε_i = Error Term
i = Bank
t = Year

IV. RESULTS AND DISCUSSION

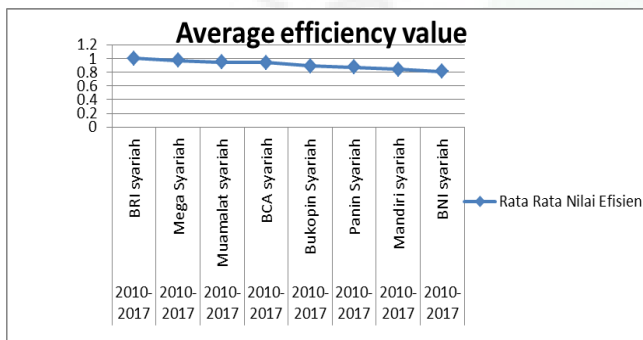The result of Data Envelopment Analysis as below:

Fig. 2. Result of Analysis

From the chart can show that the best level of efficiency is Bank Bri Syariah with a value of 1, followed by Bank Mega Syariah (0.973616), Bank Muamalat (0.943426), BCA Syariah (0.939235), Bukopin Syariah (0.892746), Panin Bank Syariah (0.874654), Mandiri Syariah (0.841564), and BNI Syariah (0.813395).

Then the result of determinan sharia bank efficiency as below:

TABEL 3. T TESTING RESULTS FOR THE SIGNIFICANCE OF THE MODEL COEFFICIENT OF DATA REGRESSION PANEL. * SIGNIFICANT TO SIGNIFICANT LEVELS (A) BY 5%.

Dependen Variabel	Independen Variabel	Koefisien Regresi	Standar Error	Statistik t	P-value (Prob.)
EFISIENSI	Konstanta	1,009119	0,063244	15,95592	0,0000
	NPF_GROSS	-1,666159	0,471622	-3,532829	0,0008*
	CAR	0,004488	0,003269	1,372881	0,1752
	SIZE	0,964983	2,367050	0,407673	0,6850
	BOPO	-0,108399	0,030741	-3,526227	0,0008*
	FDR	0,070168	0,033049	2,123136	0,0381*
	DUMMY	-0,024203	0,082808	-0,292282	0,7711

- The NPF GROSS variable of EFFICIENCY with the value of regression coefficient (Coefficient) of-1.666159 (negative influence) and P-value (Prob.) of 0.0008 (P-value < 0.05) so that the test can be concluded that there is a significant negative influence NPF_GROSS to EFFICIENCY of-1.666159

- The effect of the bank's CAR on technical efficiency is demonstrated by the value of β2 = 0.004488 with a probability of 0.1752 which means the CAR value affects positively but insignificant to the level of technical efficiency of Sharia banking.

- The effect of the bank's SIZE on technical efficiency is demonstrated by the value of β3 = 0.964983 with a probability of 0.6850 which means the SIZE value affects positively but insignificant to the level of technical efficiency of sharia banking

- BOPO variables against EFFICIENCY with a regression coefficient value (Coefficient) of-0.108399 (negative influence) and P-value (Prob.) of 0.0008 (P-value < 0.05) so that testing can be concluded that there is a significant negative influence on BOPO To EFFICIENCY of-0.108399

- Variable FDR to EFFICIENCY with a regression coefficient value (Coefficient) of 0.070168 (positive influence) and P-value (Prob.) of 0.0381 (P-value < 0.05) so that testing can be concluded that there is a significant positive effect of FDR To EFFICIENCY of 0.070168.

V.   CONCLUSIONS AND SUGGESTION

A.   Conclusion

- The Sharia Bank's 2010-2017 research period has not been fully efficient. In the period 2010-2017 only one relatively stable bank with high efficient bank BRI Syariah, while there are still banks that are not efficient and more efficient low. It continued to fluctuate until the year 2017.

- The variables used to describe the direction of influence in general in accordance with the hypotheses of previous research and study. Non Performing Financial (NPF) has a significant negative impact on the efficiency of sharia banking in Indonesia, Capital Adequacy ratio (CAR) is positively influential but not significant to the efficiency of Syariah in Indonesia, SIZE Positively influential but not significant to the efficiency of Sharia banking in Indonesia, the operational burden on operating income (BOPO) affects negatively but and significantly to the efficiency of Sharia banking in Indonesia, Financing To Deposit Ratio (FDR) positively and significantly affects the efficiency of banking in Indonesia. DUMMY explained there is no difference in EFFICIENCY value between government banks and private banks.

B.   Suggestion

- Minimizing the risk of NPF in several ways such as improving the performance of financing analyists that identifies the financial condition of the customer, so that it can prevent before the undesirable occurrence of the problem financing. It can then form a reserve of loss of value (CKPN) for financial and non-financial assets in accordance with applicable financial accounting standards. Therefore, sharia banks must have a set of procedures to form adequate backups. So that more Sian will face financing risk. Sharia banks must also maintain sufficient capital and secure liquidity policies.

- Keeping BOPO as efficient as possible so that the bank's financial quality is better so that sharia banks can expand more freely by raising new products according to research & Development conducted by the bank. Some things can be done to reconsider the BOPO is by evaluating all forms of bank spending such as rent, use of third party services, and tighten efficient and economical training for the human resources of Sharia banking.

- Maximizing the quality of FDR needs to be taken seriously in such a strong and intensive monitoring. In the current condition, even the monitoring is still done. Smooth financing Monitoring is a continuous development for customers. This strategy should be able to maintain the financing quality of each bank so that the financial ratio remains in healthy condition and avoid the problematic financing.

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