Conference Paper

The Efficiency Analysis of Sharia Banking with DEA and Islamic Value

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Abstract

This study aims to analyze the level of efficiency of Sharia banking in Indonesia with Data Envelopment Analysis (DEA) and Islamic Values during 2010 to 2016 and to see the effect of input variables and output variables on the growth rate of Sharia bank. The case studies that became the object of this research were four Sharia banks consisting of Sharia Bank W, X, Y and Z. The measurement of efficiency level in this research employed DEA and Islamic Value with input variable consisting of third-party right for profit sharing, worker load, while the output variable consisting of fund management income and other operational income. This study viewed the effect of variables using Partial Least Square (PLS). The results of this study indicate that the efficiency level of Sharia banks during the period of research, namely 2010–2016, with DEA method was fluctuated. In result of analysis of the efficiency level with Islamic value, the result shows that Islamic Value influences the level of efficiency of Sharia bank, where Shariah bank that has the best efficiency level is Sharia Bank Y. In result of analysis influence of input and output variable, the result shows that third-party right for profit-sharing variable and fund-management income have a significantly negative effect on the growth rate of Sharia banks, while the variable of work load and other operational income have a significantly positive effect on the growth rate of Sharia bank.

Keywords: efficiency, Data Envelopment Analysis (DEA), Islamic Value, Sharia bank

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1. Introduction

The rapid development and growth of Islamic finance industry, especially Sharia banking, has increased significantly. Globally, the total growth of Sharia bank assets on average per year can reach double digits (Imam and Kpodar, 2010) or about $1.6 trillion in 2012 [6]. The Sharia banking industry in Indonesia has also shown a rapid growth. These developments can be seen from several financial indicators and financial ratios in the Sharia bank.

Table 1: Development of assets, DPK and Financing of Sharia banking in Indonesia, Year 2010–Nov 2016 (in Billion Rupiah).

	2010	2011	2012	2013	2014	2015	2016
Asset	97,519	145,466	195,018	242,276	272,343	296,262	339,343
DPK	76,037	115,415	147,512	183,534	217,858	231,176	270,480
Financing	68,181	102,655	147,505	184,122	199,330	212,996	240,381

Source: Financial Services Authority (OJK)

The total asset growth in November 2016 increased by 339,343 Billion Rupiah, which earlier in 2015 amounted to 296,262 Billion Rupiah, that is, an increase of 6.37 precent. Third-party Funds in 2015 amounted to 231,176 billion Rupiah, while in 2016, it amounted to 270,480 Billion Rupiah, that is, an increase of 7.7 percent and total financing in 2015 amounted to 212,996 Billion Rupiah, while in 2016 amounted to 240,381 Billion Rupiah, that is, an increase of 6.2 percent.

Table 2: Sharia banking performance progress in Indonesia, 2010–Nov 2016 (in percent).

	2010	2011	2012	2013	2014	2015	2016
NPF	3.02	2.52	2.22	2.62	2.55	3.03	3.26
FDR	89.66	88.94	100.00	100.32	109.2	104.88	96.60

Source: Financial Services Authority (OJK)

In addition, financial ratios such as NPF and FDR indicate an improvement in performance reflecting developments in the Sharia banking industry in Indonesia and show that banks have used their financial resources well to increase investment and growth. The progress of the national Sharia banking industry is also evidenced by the amendment of Law No. 7 of Year 1992 to Law No. 10 of Year 1998 on Banking, which recognizes the existence of Dual Banking System, namely, a conventional system with Sharia system or profit sharing. In addition, to further strengthen the status of Sharia banks in Indonesia, the government regulates specifically in Law No. 21 of Year 2008. Moreover, the government gives policies for development and growth; one of them is to give permission to the Conventional Bank to open a branch office of Sharia Business Unit (UUS) and also spin off or by converting conventional bank to Sharia bank.

Based on the data in Table 3, it can be seen that the number of Sharia Commercial Banks in 2016 were 13, while the Sharia Business Unit amounted to 21 and BPRS amounted to 164; the data show that the national Sharia Banking industry compete strictly, especially during the years 2010 to 2016, where the development of Sharia

Table 3: Growth of Sharia banking, Year 2010–Nov 2016.

	2010	2011	2012	2013	2014	2015	2016
BUS	11	11	11	11	12	12	13
UUS	23	24	24	23	22	22	21
BPRS	150	155	158	163	163	163	164

Source: Financial Services Authority (OJK)

banking was not only related to the amount of assets, the number of Third-party Funds (DPK) and the amount of financing, but also related to the growth of the number of Sharia banks over the period and performance of the bank.

The large number of Sharia banks operating in the form of Sharia Commercial Bank (BUS) and UUS (Sharia Business Unit) in Indonesia with various forms of products and services on the one hand can have a positive impact, but on the other hand can cause problems in the community (Muharram and Purvitasari, 2007). The increasingly dynamic economic conditions and business environment will certainly affect the performance of banking (Prasetyia and Diendtrara, 2010), then the question that arises is whether the performance of Sharia banking efficient? Or is Sharia banking an inefficient state when facing tight competition or global competition? How is the level of efficiency of Sharia banking? According to Bar, Seiford and Sims (1994), efficiency has been continuously said to be a major cause in bank failures [12].

Efficiency in the banking sector is one of the economic issues that attract world economists. Based on Berger and Humprey (1997) research, there were about 130 studies on efficiency-level analysis where most of the researches were in US banking industry. Some research on efficiency level in banking institution, especially Sharia banking, by using Data Envelopment Analysis (DEA) method was carried out by Sufian (2007); this research is about the analysis of efficiency level of domestic and foreign Sharia bank in Malaysia during the period 2001–2004. The result of this research found that domestic Sharia bank was more efficient compared to foreign Sharia banks and shows that the inefficiencies of these banks operated on the wrong scale of operations. While other studies conducted by Kammarudin et al (2008) at Sharia Bank in Malaysia during the period 1998–2004 shows that the Sharia bank was more efficient in controlling costs than to generate profits. Tahir et al. (2011) conducted research on four regions, namely, Africa, Far East, Central Asia, Europe and the Middle East during the period 2003–2008. The result shows that the average efficiency of these banks decreased from 74.6 percent in 2003 to 54.4 percent in 2008 and that pure technical

efficiency resulted in inefficiency of Sharia banks. Their result also shows that there was a significant difference in efficiency between sizes but not between regions.

Subsequent research conducted on Sharia bank in Indonesia was conducted by Pratikto and Sugianto (2011), where the research is to measure the level of efficiency of Sharia banking before and after the global economic crisis of 2006 to 2010 with DEA method; the result is the condition of Sharia banking before and after the global crisis was in good shape and there was no significant difference between before and after the economic crisis. The next research was conducted by Firdaus and Hosen (2013) who examined the efficiency of Sharia Public Bank using two stages of DEA at 10 BUS in Indonesia from second quarter of 2010 to fourth quarter of 2012. The result of this research is that the average efficiency level of all banks had a fluctuating trend, where the lowest score of efficiency was in 2011, thus said, Sharia bank is still inefficient.

Definition of efficiency according to Kost and Rosenwig (1979) is the ratio between input and output; there are three factors that cause the efficiency, namely, when in the same input producing a larger output, with small inputs produce the same output and with large inputs producing greater output [15]. In economic theory, there are two general concepts of efficiency, namely, efficiency in terms of economic concepts and the efficiency in terms of production concept. The efficiency reviewed by the economic concept has a broader scope from macro point of view, while efficiency from production concept looks from micro perspective (Suryadi, 2011). Efficiency in macro concepts is looking extensively at the allocation of resources within an economy that brings prosperity in society [14].

The concept of efficiency derived from microeconomic theory, namely, the theory of producers and consumer theory. The producer's theory states that producers seek to maximize profits and minimize costs. While consumer theory states that consumers want to maximize the level of usefulness or level of satisfaction. In the theory of producers, there is something called frontier production line. This line describes the relationship between input and output in the production process. This production frontier line represents the maximum output level of any use of input resources representing the use of technology from a company or industry (Huda and Nasution, 2009: 10)

The use of resources can be said to be efficient if: (1) All available resources are fully utilized; (2) The pattern of its use is such that there is no longer any other usage style that will provide additional prosperity for the community/individual [14]. Efficiency in the concept of production tends to assess technically and operationally, so that efficiency within the concept of production is generally viewed from a technical standpoint and cost. Efficiency in the concept of production is limited to looking at the

technical and operational relationships in a production process, that is, the conversion of inputs into outputs (Sutawijaya, Adrian et al., 2009: 53).

Bank efficiency is one of the important indicators to analyze the performance of a bank, as well as a means to improve the effectiveness of monetary policy. According to Hadad, Muliaman D. (2003), when the efficiency measurement is performed, the bank is faced with the conditions of how to obtain optimal levels of output with existing input levels, or to obtain a minimum level of input with a given level of output. Another important aspect of achieving bank efficiency is through reducing costs in the production process. According to Muharram and Purvitasari (2007), efficiency measurement is done through three approaches, namely:

1. Ratio Approach: Measurement of the efficiency level is done by calculating the output ratio with the input used. The calculation results will reflect the high efficiency, if the output is maximum and input is minimal.
2. Regression Approach: In this approach, efficiency measurement uses a model of a given level of output as a function of different levels of input. The regression equation can be written as follows

$$Y = f(X1, X2, X3, X4.....Xn),$$

where:

Y = output

X = input.

This approach may also include only one output indicator in a regression equation.

3. Frontier Approach: In this approach, the efficiency measurement is divided into two types, namely, the nonparametric frontier approach, which can be measured by nonparametric tests, using DEA, and the parametric frontier approach, which can be measured by Stochastic Frontier Analysis (SFA) and Distribution Free Analysis (DFA).

The concept of efficiency in Islam is deemed that existing resources should not be wasted or misused because of accountability to God, whereby all these resources are not regarded, whether in Human Resources or Natural Resources, both rare and abundant, costly or free. The efficient use of resources in Islamic economics is determined on the basis of maqashid. According to Faridi (1983), any use that thwarts the realization of maqasid should be viewed as futility and inefficiency (Suyanto, 2010). This inefficiency can lead to an increase in costs and decrease in profits.

The increasing complexity of economic and life issues, coupled with the urgency of efficiency measurements, has also developed a measure of efficiency with various analytical tools. However, the analytical tool that has been developed still needs to inculcate the meaning of worship in the process of analytical tools in order to make the purpose of economic analysis provide double benefits of the world and the hereafter (Aziz, 2016). The meaning of worship is a natural process in every activity of human life including economy. Allah affirms that creation must contain the meaning of worship.

Until now, economic science adopts analysis tools from the West such as linear program and multiple regression. The great probability of these analytical tools lacking in worship value is because Westerners build the analytical tools that always negate the religious factor in science. For that, Muslim researchers need to be encouraged in congregation, changing the concept of analytical tools in accordance with the Islamic way of thinking, so that it can provide a benchmark in accordance with Islamic values.

Concepts in Islamic economic analysis tools gain appreciation from different points of view. Some start from the philosophy of monotheism, some depart from the perspective of maslahah and some view from the meaning of worship. Theory H, which stands for HAHSLM, uses the viewpoint of worship definition. The definition of H theory from HAHSLM according to Aziz (2015) is:

1. Narrowly, H theory is defined as the basic theory of three dominants with a particular context in the five dimensions of the invariant order.
2. Widely, the most general use of H theory can be interpreted as the basic conceptual theory of creation patterns with a particular relationship. H is derived from the formula H = A.H (S, L, M). Al-Quran Hijr Surah, also stands for Huda or Life.

While the meaning of H theory among others [1] is:

1. A whole set or an integrated system or an integrated part will consist of 3 (three) main elements: primary (creator/intermediary), secondary (creation/receiver) and tertiery (worship/transmitter), which may be positively or negatively charged.
2. The three elements will satisfy the statement that the secondary below the primary will do tertiery (man is created by God to worship)

The development of epistemology in Islamic institutions such as Sharia banking presents new terminology as a more comprehensive approach. In general, the philosophy of H theory can logically be in sequence that the background of this theory is

the Islamic value with a comprehensive concept through a balanced way to embody the meaning of worship in life. This is in accordance with the content of the Qur'an that reads '*silmi kaffah*', with the explanation that the word '*silmi*' is a derivation of the letters *sin lam mim*. The basic word '*sinlammim*' is generally one of the solutions to penetrate the development of concepts in order to solve the fundamental problems. This is the need for a better method of making balance in overcoming the limitations of methodology in Islamic studies.

1.1. Research questions

1. What is the efficiency level of Sharia banking by using DEA method?
2. What is the efficiency level of Sharia banking with Islamic Value?
3. What is the effect of input and output variables on the growth rate of Sharia banking?

1.2. Research objectives

1. Knowing the efficiency level of Sharia banking by using DEA method.
2. Knowing the efficiency level of Sharia banking with Islamic Value.
3. Knowing the influence of input and output variables on the growth rate of Sharia banking.

2. Research Methodology

This research covers the analysis of efficiency level of Sharia commercial bank only in Indonesia, during the period 2010–2016, and with DEA approach of Constant Return to Scale (CRS) and Islamic Value. The data used were Sharia bank financial statements; the samples were 4 (Four) Sharia banks, namely, Sharia Bank W, X, Y and Z. This research used input variables consisting of third-party rights for (I1) and worker load (I2), as well as the output variables consisting of fund management income (O1) and other operational income (O2), while for influence analysis using the model of Partial Least Square (PLS) Structural Equation Modeling (SEM) (XS), worker load (X2), fund management income (X3) and other operational income (X4) on the growth rate of Sharia Commercial Banks (Y).

2.1. Data envelopment analysis (DEA)

Data Envelopment Analysis (DEA) was first developed by Farrel (1957), which measures the technical efficiency of one input and one output into multiple inputs. This analytical tool is popularized by several other studies. There are two models of DEA. The first model is Charnes Cooper Rhodes (1978) or CRS. CRS is a change in the same proportion at the input level producing the same proportion at the output level. The second model is Bankers Charnes and Cooper (1984) or Variable Return to Scale (VRS). VRS is all measured units that will produce changes at different levels of output, and the scale of production will affect efficiency. It is this difference that distinguishes CRS from VRS, in CRS the scale of production does not affect efficiency.

Efficiency in DEA is the ratio of the total weighted output divided by the total weighted inputs or scales for each UKE input and output (Muharram and Purvitasari, 2007). DEA will calculate banks that use inputs to produce different outputs (Miller and Noulas in Sutawijaya and Lestari).

$$h_s = \sum_{i=1}^{m} \mu_i y_{is} \sum_{j=i}^{n} \upsilon_j x_{js}, \tag{1}$$

where:

h_s = bank *s* efficiency

m = bank output

n = observed input of bank *s*

y_{is} = number of output *i* produced by bank *s*

x_{js} = number of input *j* used by bank *s*

u_i = weight of output *i* produced by bank *s*

v_j = the weight of *j* given by banks *s* and *i* is calculated from 1 to m and j arith from 1 to n.

The use of one input variable and one output is shown in Equation 1 efficiency ratio (hs), then maximized by the following constraints (sutawijaya dan lestari, 2009: 27):

$$\sum_{i=1}^{m} \mu_i y_{is} \sum_{j=i}^{n} \upsilon_j x_{js} \leq 1 \text{untuk } r = 1, \ldots, N, \tag{2}$$

where

$$\mu_i \; dan \; \upsilon_j \geq 0 \tag{3}$$

.

Equation (2) mentions that N represents the number of banks in Sample and r is the type of bank sampled in the study. The first inequality explains that the risk for other UKEs is not more than 1, while the second inequality is non-negative (positive). The ratio will vary between 0 and 1. The bank is said to be efficient, if it has a ratio close to 1 or 100 percent, whereas close to 0 indicates a lower bank efficiency. At DEA, each bank can determine its respective weights and ensure that its selected weighting will result in the best performance measures (Sutawijaya and sustainable, 2009: 57).

2.2. H test

Procedural process of engineering methodology H is done from the collection of data from objects that are sampled in the implementation of this theory [1].

1. First, performing data collection to obtain the quantity of the object to be reviewed in value, price, index, percentage or nominal that is in the form of original price.
2. Second, reviewing the magnitude rate of the object to be calculated on a percentage scale of the difference from the initial price to the next price or the difference of the first quantity by the second and subsequent quantities.

$$\frac{x2 - x1}{x1} atau \frac{data\ th\ 2011 - data\ th\ 2010}{data\ th\ 2010}$$

3. Third, making the average pattern of the object to be reviewed with this theory perspective compared to other similar objects or reviewing the position of objects comparable with the average of similar objects.

$$\bar{X}\, laju = \frac{l1 + l2 + l3 + \cdots ln}{Jumlah\ tahun\ atau\ jumlah\ laju}$$

4. After obtaining the nominal rate and average rate, other data are required from the same object in the form of data originating intangible or associated with the value of religion to obtain the weight compared with other objects. This weight value can be done by:
   (a) Creating a weight ratio based on other data of the same object, then compared with the weight of another object with the data for which the rank or weight order between the main objects and the comparable object is obtained.
   (b) In addition to using the data source of the studied object, combined with an expert adjustment/structured interview with a science expert who has the authority to assess the weight of an object.

(c) Thereafter, performing the ranking of objects based on the weight obtained from various sources of data, so that the order also presents the weight of the object being studied.

5. Furthermore, after obtaining the nominal data, the rate and the weight, next step is doing calculation in the form of multiplication of the object data in the following form:

   H = Weight X Average Rate X Last Year Nominal

   Weight = Reliogious Value/Worship Value

   Average Rate =

   Nominal/X6 = (value of x on the last period in the financial report data).

6. After getting the result of the calculation of the object under study, the next step is making matrix to get the result of Islamic value of H1 as deviation, H2 as coefficient and H3 as impact or no impact.

2.3. Partial least square (PLS)

PLS was originally developed as a method for estimating path modes that use latent variables with multiple indicators. PLS was originally called NIPALS (Nonlinear Iterative Partial Least Square). The PLS approach is distribution-free, which can be nominal, category, ordinal, interval and ratio. In its development, the PLS model was completed by Herman Wold in 1979, which was further developed by Lohmoller in 1984. Sirohi (1998: 232) argues that PLS is a powerful technique in analyzing latent variables that have several indicators on SEM. Chin (1998) adds that PLS uses a minimum-squares-based estimation procedure, which has no pressure on the scale of measurement, distribution of data or samples. PLS is an alternative approach that shifts from a covariance-based SEM approach to variance-based (Ghozali, 2011: 19). The PLS design is intended to overcome the limitations of other SEM methods when the data encounter problems such as measurement of data with a certain scale, small sample quantities, missing values, abnormal data and the presence of multicollinearity.

2.3.1. Model specifications

There are two path analysis models in PLS, namely, Inner Model, which shows how variable manifest or observed variables represent latent variables to be measured,

and outer models showing the strength of estimation between latent variables and constructs.

1. Inner Model

   A model that describes the relationship between latent variables based on substantive theory. The model of inner model equation is as follows:

   $$\eta = \beta_0 + \beta\eta + \xi + \zeta,$$

   where :

   η = Endogenous latent variable vector (dependent)

   ξ = Exogenous latent variable vector (independent)

   ζ = Residual Vector (unexplained variance)

2. Outer model

   The model that describes the relationship of each indicator block relates to its latent variable. Outer model is also called the measurement model. In the outer model, there is a reflective indicator model and a formative indicator model. In reflective indicator, it is often referred to as principal factor model that means manifest variable are influenced by latent variable. The equation of this reflective indicator model is as follows:

   $$x = \lambda x\xi + \varepsilon x$$

   $$y = \lambda y\eta + \varepsilon y$$

   where x and y are indicators for exogenous latent variables (ξ) and endogenous latent variables (η). While λx and λy are loading matrixes that describe such a simple regression coefficient that connects latent variables with indicators, εx and εy are the residual measurement errors.

   The formative model assumes that the manifest variable affects latent variables. The direction of the causality relationship flows from the manifest variable to the latent variable. The equations of the formative indicator model are:

   $$\xi = \Pi\xi Xi + \delta\xi$$

   $$\eta = \Pi\eta Yi + \varepsilon\eta$$

   where ξ, η, X and Y are equal to the previous equation. Πx and Πy are like multiple regression coefficient of latent variable to indicator, while n$\delta\xi$ and $\varepsilon\eta$ are residual of regression.

2.3.2. Assessment criteria

PLS has several evaluations of structural models and existing measurement models. In the evaluation of the measurement model, convergent validity, discriminnat validity, composite validity and average variance extracted were tested. While in the evaluation of structural model, R-Squared (R2) test and path coefficient estimation test were performed.

1. Convergent Validity was used to measure the magnitude of the correlation between latent variables and manifest variables in the reflexive measurement model. The evaluation of convergent validity was assessed based on component score with construct score. A correlation can be said to meet convergent validity if it has a loading value of > 0.5 and ideally > 0.7.
2. Discriminant Validity: Discriminant validity can be calculated based on the cross-loading value of the manifest variable against each latent variable. If the correlation between latent variables with each indicator is greater than the correlation with other latent variables, then the latent variable can be said to predict the indicator better than other latent variables.

   Discriminnat validity can also be calculated by comparing the square root value of average variance extracted (AVE). if $\sqrt{}$AVE is higher than the correlation value between latent variables, the discriminant validity can be considered achieved, with an AVE value > 0.5.
3. Composite Variable: The latent variable is said to have good reliability if the composite reliability value is > 0.6.
4. R-Squared: The R-squared value is used to assess how much influence the latent variable is independent of the dependent variable. According to Chin, the R-Squared result of 0.67 indicates that the model is good. An R2 of 0.33 indicates that the model is moderately categorized, whereas if R2 results less than 0.33, it indicates that the category is weak.

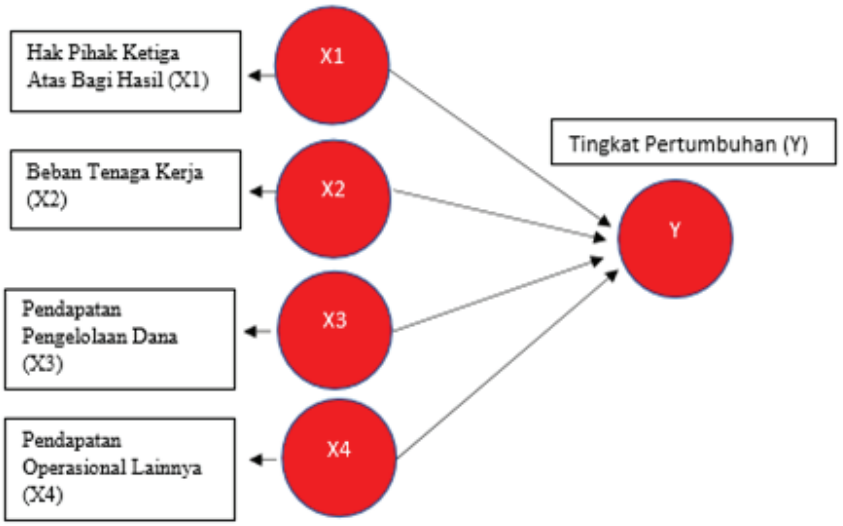
2.3.3. Criteria for acceptance and rejection of hypothesis

Hypotheses in this research are:

H_0 = There is no influence of input and output variables on the growth rate of Sharia bank

H_1 = There is an influence of input variable and output variable to the growth rate of Sharia bank

Determining the criteria for acceptance and rejection of this research hypothesis was by using *T*-statistic and R-Square value. The *t*-statistic score is compared with the *t*-table value, the *t*-table value in this study is 1.96 with the 0.05 (two tail) significance level.



Third-party right on profit sharing

Worker load

Fund management income

Other operational income

Growth rate

3. Result and Discussion

Calculating the level of efficiency of Sharia banking with DEA method using DEAWIN software shows the result as given in Table 1:

Based on the data of Table 1, the efficiency level of four Sharia banks can be seen; for Sharia Bank 'W' in 2010, the efficiency level was 100 percent, while in the following years, it experienced inefficiency—in 2011, inefficiency of 4.65 percent; in 2012, inefficient by 2.81 precent; in 2013, inefficient by 4.74 percent; in 2014, inefficiency of 4.53 percent; and 2015 was the year with the highest inefficiency of 15.68 percent; while in 2016, the Sharia bank 'W' could restore the level of efficiency to 100 percent. For Sharia bank 'X', there were two years that experienced 100 percent efficiency, which were

Table 4: Efficiency level of Sharia bank W, X, Y, Z(in percent).

Sharia Bank	Year						
	2010	2011	2012	2013	2014	2015	2016
W	100	95.35	97.19	95.26	95.47	84.32	100
X	95.83	89.27	100	95.25	94.99	99.60	100
Y	100	100	100	100	92.46	91.85	100
Z	94.61	100	100	100	88.17	94.56	100

Source: Data were processed by using DEAWIN

in 2012 and 2016; while in 2010, it experienced an inefficiency of 4.65 percent; 2011 had an inefficiency of 10.57 percent; in 2013, inefficiency of 4.75 percent; in 2014, the level of efficiency decreased compared to the year 2013, where in 2014, it experienced an inefficiency of 5.01 or 0.26 percent lower than 2013. While in 2015, Sharia Bank 'X' could reduce the inefficiency level to 0.4 percent.

The efficiency level of Sharia Bank 'Y' was at a level of efficiency that is considered better than other Sharia banks because almost every year experienced a 100-percent efficiency level; it was influenced if we look at the data of each variable, the Sharia Bank 'Y' was not very sharply fluctuating and had a good average year of growth rate, although the volume number of Sharia Bank 'Y' was not greater than the Sharia Bank 'Z', which indicates that Sharia banks that have large numbers or large revenues do not necessarily have a good level of efficiency. In 2014, Sharia bank 'Y' experienced an inefficiency of 7.54 percent and in 2015, an inefficiency of 8.15 percent. The efficiency level of Sharia bank 'Z' was 100 percent in 2011, 2012, 2013 and 2016; while in 2010, its inefficiency rate was 5.39 percent, in 2014, it was inefficient by 11.83 percent, followed by 5.44 percent inefficiency in 2015.

Based on the calculation results, it can also be seen that the lowest level of efficiency is at the level of 84.32 percent, which occurred in 2015 at the Sharia Bank 'W'. While the average level of efficiency of four Sharia banking in the year 2010 amounted to 97.61 percent, in 2011 to 96.15 percent, in 2012 to 99.29 percent, in 2013 to 97.62 percent, in 2014 to 92.77 percent, in 2015 to 92.58 percent and in 2016 to 100 percent. Thus, it can be concluded that the average level of Sharia bank efficiency experienced fluctuating conditions in each study period. There is only one study period in which all Sharia banks had a stable level of efficiency that was in 2016 at 100-percent level, while in the period 2010–2015, Sharia banks had a fluctuating efficiency level.

The weights obtained as a result of the calculation level of Sharia banking efficiency with Islamic Value methodare listed in Table 2.

Table 5: Islamic value weight.

Sharia Banks	Islamic Value Weight
Sharia Bank 'W'	0.80
Sharia Bank 'X'	0.40
Sharia Bank 'Y'	0.99
Sharia Bank 'Z'	0.50

Table 2 shows the weight of Islamic values or the value of religiosity obtained, the value of religiosity was obtained through comparison and confirmation of the Value of Worship performed by each Sharia bank. The H test was performed on each of the variables used in this study. Based on the calculation of H Test conducted by the researcher on input variables of third party on the profit sharing, the following results were obtained.

Table 6: H effectivity on Input 1 Sharia bank 'W'.

SHARIA BANK 'W' I1	
(H1) STRAIGHT RESULT	(+)
(H2) LOADS RESULT	0,16
(H3) IMPACT RESULT	IMPACT

Source: Processed data of 2010–2016

Table 7: H effectivity on Input 1 Sharia bank 'X'.

SHARIA BANK 'X' I1	
(H1) STRAIGHT RESULT	(–)
(H2) LOADS RESULT	–0,46
(H3) IMPACT RESULT	NO IMPACT

Source: Processed data of 2010–2016

From all test results of H on input variables of third-party right on profit sharing in each bank, it can be seen that Sharia banks 'W', 'Y' and 'Z' have an impact in the contribution of the development of third-party right on profit sharing based on Islamic values meaning that Sharia banks W, Y and Z are efficient on the basis of Islamic values, whereas Sharia Bank X has no impact in the contribution of developing third-party right

Table 8: H effectivity on Input 1 Sharia bank 'Y'.

SHARIA BANK 'Y' I1	
(H1) STRAIGHT RESULT	(+)
(H2) LOADS RESULT	0,23
(H3) IMPACT RESULT	IMPACT

Source: Processed data of 2010–2016

Table 9: H effectivity on Input 1 Sharia bank 'Z'.

SHARIA BANK 'Z' I1	
(H1) STRAIGHT RESULT	(+)
(H2) LOADS RESULT	0,06
(H3) IMPACT RESULT	IMPACT

Source: Processed data of 2010–2016

on profit sharing based on Islamic values, seen in the results of efficiency calculations with Islamic Values.

The results of efficiency calculation by Islamic Values method on the variable of worker load input at each bank are as follows.

Table 10: H effectivity on Input 2 Sharia bank 'W'.

Sharia Bank 'W' I2	
(H1) STRAIGHT RESULT	(+)
(H2) LOADS RESULT	0,08
(H3) IMPACT RESULT	IMPACT

Source: Processed data of 2010–2016

Table 11: H effectivity on Input 2 Sharia bank 'X'.

Sharia Bank 'X' I2	
(H1) STRAIGHT RESULT	(+)
(H2) LOADS RESULT	0,01
(H3) IMPACT RESULT	IMPACT

Source: Processed data of 2010–2016

From the results of the H test on each Sharia bank performed on worker load input variables, it gives the result that there are three Sharia banks that had impact on the

Table 12: H effectivity on Input 2 Sharia bank 'Y'.

Sharia Bank 'Y' I2	
(H1) STRAIGHT RESULT	(+)
(H2) LOADS RESULT	0,07
(H3) IMPACT RESULT	IMPACT

Source: Processed data of 2010–2016

Table 13: H effectivity on Input 2 Sharia bank 'Z'.

Sharia Bank 'Z' I2	
(H1) STRAIGHT RESULT	(–)
(H2) LOADS RESULT	–0,16
(H3) IMPACT RESULT	NO IMPACT

Source: Processed data of 2010–2016

development of worker load variable, that are, Sharia Banks 'W', 'X' and 'Y'. Sharia bank 'Z' had no impact on the development of variable worker load. This shows that Sharia banks W, X and Y were efficient in variable worker load. While Sharia bank Z was not efficient, or inefficient, based on Islamic Value, which means that Sharia bank Z gave the worker labor exceeding the average—so that it affects the efficiency.

The results of efficiency calculation by Islamic Value method on the variable of output of fund management income in each Sharia bank are as follows.:

Table 14: H effectivity on Output 1 Sharia bank 'W'.

Sharia Bank 'W' O1	
(H1) STRAIGHT RESULT	(+)
(H2) LOADS RESULT	0,03
(H3) IMPACT RESULT	IMPACT

Source: Processed data of 2010–2016

From all the results of the H Test on the output variable of the fund management income in each bank, it can be seen that Sharia banks 'W' and 'Y' had an impact in the contribution of third-party right development on profit sharing based on Islamic value, which means that the two banks were efficient based on Islamic Values. While Sharia banks 'X' and 'Z' had no impact in the contribution of development of fund management income variable based on Islamic value or not yet efficient or inefficient

Table 15: H effectivity on Output 1 Sharia bank 'X'.

Sharia Bank 'X' 01	
(H1) STRAIGHT RESULT	(–)
(H2) LOADS RESULT	–0,16
(H3) IMPACT RESULT	NO IMPACT

Source: Processed data of 2010–2016

Table 16: H effectivity on Output 1 Sharia bank 'Y'.

Sharia Bank 'Y' 01	
(H1) STRAIGHT RESULT	(+)
(H2) LOADS RESULT	0,39
(H3) IMPACT RESULT	IMPACT

Source: Processed data of 2010–2016

Table 17: H effectivity on Output 1 Sharia bank 'Z'.

Sharia Bank 'Z' 01	
(H1) STRAIGHT RESULT	(–)
(H2) LOADS RESULT	–0,26
(H3) IMPACT RESULT	NO IMPACT

Source: Processed data of 2010–2016

in fund management income variable. The results of efficiency calculation with Islamic Value method on other operational income variable are as follows.

Table 18: H effectivity on Output 2 Sharia bank 'W'.

Sharia Bank 'W' 02	
(H1) STRAIGHT RESULT	(–)
(H2) LOADS RESULT	–0,38
(H3) IMPACT RESULT	NO IMPACT

Source: Processed data of 2010–2016

Based on the results of Test H on the second output variable that is the other operational income on each Sharia bank, it is found that Sharia banks X and Y were efficient based on Islamic Values, while Sharia banks W and Z were not efficient or inefficient based on Islamic Values and had no impact on the development of other operational income variables.

Table 19: H effectivity on Output 2 Sharia bank 'X'.

Sharia Bank 'X' O2	
(H1) STRAIGHT RESULT	(+)
(H2) LOADS RESULT	0,14
(H3) IMPACT RESULT	IMPACT
Source: Processed data of 2010–2016	

Table 20: H effectivity on Output 2 Sharia bank 'Y'.

Sharia Bank 'Y' O2	
(H1) STRAIGHT RESULT	(+)
(H2) LOADS RESULT	0,44
(H3) IMPACT RESULT	IMPACT
Source: Processed data of 2010–2016	

Table 21: H effectivity on Output 2 Sharia bank 'Z'.

Sharia Bank 'Z' O2	
(H1) STRAIGHT RESULT	(–)
(H2) LOADS RESULT	–0,20
(H3) IMPACT RESULT	NO IMPACT
Source: Processed data of 2010–2016	

In the analysis of the effect of input and output variables on the growth rate of Sharia bank by using PLS, by testing the hypothesis, the result of Test *T* was obtained as follows:

Table 22: *T*-test result.

	Original Sample	*T*–Statistic	*P* values
Third party right on profit-sharing Sharia bank growth rate	–3.911	3.777	0.000
Worker load Sharia bank growth rate	11.189	5.616	0.000
Fund Management Income Sharia bank growth rate	–8.030	5.855	0.000
Other Operational Income Sharia bank growth rate	1.380	9.941	0.000
Source: Data processed using SmartPLS			

The result shows that the input variable consisting of third-party right on profit sharing with *T* statistics of 3.777 > 1.96 significantly and negatively affects the growth rate of Sharia bank, and the variable of work load, with *T* statistics of 5.616 > 1.96 significantly has a positive effect to Sharia bank's growth rate. The result of the output variables consisting of fund management income with *T* statistics of 5.855 > 1.96 significantly and negatively affects the Syariah bank growth rate, and other operational income variable with the value of *T* statistics of 9.941 > 1.96 significantly has positive effect on the Sharia bank growth rate with a coefficient value of 1.380. Thus, both input and output variables have an influence on the growth rate of Sharia banks, and H1 is accepted.

4. Conclusion

Based on the calculation, the average efficiency of all Sharia banks in 2010 amounted to 97.61 percent, in 2011 to 96.15 percent, in 2012 to 99.29 percent, in 2013 to 97.62 percent, in 2014 to 92.77 perecnt, in 2015 to 92.58 percent and in 2016 to 100 percent, thus during the study period, the average level of Sharia bank efficiency fluctuated. The efficiency level of Islamic banks based on Islamic values, based on the results of Test H shows that of the four Sharia banks that became objects of this research, only Sharia bank 'Y' was efficient and could contribute to the development of all variables both input and output, while Sharia banks W, X and Z on some variables based on Islamic Values were not efficient, thus Islamic Values can affect the efficiency of Sharia banking, improve the efficiency of Sharia bank by increasing the weight of the Value of Worship or Islamic Values. And in the result of analysis, influence of input and output variable indicates that variables of input and output influence the growth rate of Sharia banks.

4.1. Suggestions

Increasing the level of efficiency can be done by increasing or decreasing the amount of input and output of each Sharia bank in accordance with the target input or target output based on the results of calculations in this study in each year, and maintaining the target input and output that has been 100 percent achieved well. Efficiency with Islamic Value will be better if Islamic values are not only embedded in operational aspects of Banks, but also in Human Resources (HR) working in Sharia banks, so that Sharia bank is not only efficient with conventional approach measurement but also the

measurement of the Sharia approach or Islamic Values. The value of Islam is derived from the weight of Islamic Values, the weight of Islamic Values is derived from the precision of Zuhr prayers in congregation of employees, this weight will increase the efficiency and effectiveness level of Sharia banks.

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