Efficiency of Fund Management of Sharia Banking in Indonesia (Based On Parametric Approach)

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ABSTRACT
The high level of competition among Islamic banks is required the bank to keep manage existing funds more efficiently. Currently, the competition among Islamic banks back to the level of price competition (margin profit sharing), where the rate of profit sharing is slightly different, thus efficiency of fund management is required. The aim of this study is to know the level of cost efficiency among Islamic Banks (BUS) in Indonesia, in this case, Bank Muamalat Indonesia (BMI), Bank Syariah Mandiri (BSM) and Bank Syariah Mega (BSM) are investigated during the study period of January 2008 to September 2010 using parametric approach namely Stochastic Frontier Approach (SFA). The results show that the Bank Muamalat Indonesia is the greatest level of cost efficiency among Islamic Banks in Indonesia. The factors which influence the input and output level of cost efficiency of each Islamic Banks are; the effect on BMI is the sharing expenses, BSM is cost-sharing expenses, personnel expenses and total financing and BMS is personnel expenses, total financing, and securities which owned.

KEY WORDS
Efficiency, Stochastic Frontier Approach (SFA), Input, Output

JEL CODES
D04, D24, D57

1. Introduction
Bank as a business entity certainly have purpose to get profit for all parties (profit oriented). This profit can be generated from bank’s main activity such as fund-raising activities and fund distribution activities. Profits which are generated in the banks not only an attraction for people to invest their funds in the bank. But also that profit indicates that banks are in good shape, including the characteristics of healthy banks.
For assess whether a banks including a bank category of healthy or sick bank, it will be seen from its operational performance. Performance can be measured by looking at the efficiency of the bank’s fund management. For it with the more efficient bank then it will indicate the level of bank health (Suseno, 2004).

Efficiency is one of the performance parameters which is one of the underlying performance of the entire performance of an organization. Ability to produce maximum output with aught input, is a measure of expected performance. At the time that efficiency measurements performed, banks are faced with the conditions of how to obtain the optimal level of output with the aught input level, or get the minimum input level to the level of output (Hadad, 2003).

Competition in the banking industry is growing quickly. At first technological advantage has become a competitive advantage for banks technology pioneer. Until the1990s, banks that excel in technology such as on-line system and using an ATM attractively able to attract far more customers than other banks are still using off-line system. Currently, almost all large and medium-sized of banks are to use these technologies. ATM and on-line system is no longer able to be the deciding factor of a bank's competitive advantage, because the facility has now turned in to a necessity and a standard bank services.

At the time the bank became the standard conditions at a higher level, and then the inter-bank competition has now returned to price competition. Prices should be very competitive in order to attract interest to customers and prospects. So that banks can provide competitive prices and also the resulting optimal profit, then the efficiency of fund management is essential (Sugiarto, 2006).

In the midst of a tight competition with a number of Islamic banks are popping up, the efficiency of an Islamic bank will be the capital in order to become the best among the Islamic banks are another. Islamic banks are the main revenue is from financing. With efficient Islamic banks, Islamic banks will then be able to give a percentage fee or a smaller margin for borrowers of funds in Islamic banks. So this became the main attraction for customers who want to borrow funds of Islamic banks. With an efficient management of funds, Islamic banks will be able to compete. Thus the market share of Islamic banks may be increased.

1.1. Problems Identification
   a. What is the level of cost efficiency of Islamic banks in Indonesia in January 2008 to September 2010 based on the parametric approach.
   b. The components of the input and output what has the greatest influence on the level of cost efficiency of Islamic banks.

1.2. Research Purpose
   a. Measuring the efficiency level of sharia banks in Indonesia in the period January 2008 to September 2010 with the parametric approach.
   b. Analyzing the components of the input and output which affects the level of cost efficiency of Islamic banks.

2. Literature Review
   Muliaman D. Hadad, Wimboh Santoso, Eugenie Mardanugraha, and Dhaniel Illyas comparing measurements of the Indonesian banking efficiency levels by the method of Stochastic Frontier Approach (SFA) and by the method of Distribution Free Approach (DFA). Object of this study 167 banks
operating in the period January 1995 to June 2003, both overall data bank and data bank that the bank had been grouped by category.

The results of these studies, the efficiency of DFA scores more diverse than the score for SFA, if used monthly data and annual data that incorporates the entire bank. Nevertheless, the banks most efficiently generated by using both methods are the same. The results of efficiency calculations based on the SFA and DFA by using a data bank which first grouped by bank category, resulting in the calculation results are not consistent. This inconsistency is probably due to lack of observation of cross section is used, so the diversity of data is reduced.

The results of this calculation also concluded that the banks with foreign banks mixed category is the category that most efficiently compared with other categories. Consistency of calculations using parametric methods using monthly and annual data from the bank without grouping by category. So it can be concluded that parametric methods are effective if applied to determine the most efficient banks in the sample without first classify banks based on its category. Consistency is demonstrated by looking at the same bank in the most efficient bank in the sample, either by using the SFA and DFA methods (Hadad, 2003).


The result is known that the average technical efficiency and cost of conventional commercial banks are higher than Islamic banks. However, in terms of trends that the average efficiency of Islamic banks tend to increase from seven periods, while the efficiency of conventional banks did not change much during the same period. Efficiency based on type, sharia banks are significantly more efficient than Islamic business units. And the average efficiency of banks according to ownership status, it is known that foreign Islamic business units more efficient than domestic banks shariah business unit (Mokhtar, Ahmad, 2007).

Eddy Hartono researched on cost-efficiency analysis of the Indonesian banking industry by using the method of parametric Stochastic Frontier Approach. In this study, he analyzed differences in the cost efficiency of banks in Indonesia based on each bank and banking group listed on the Indonesia Stock Exchange covering the period of 2004-2007 state-owned business groups (BUMN), private-owned business groups (BUSN) Foreign Exchange and Non-Foreign Exchange.

Efficiency in this study are based on the cost function, with consider the total cost as the dependent variable and 2 pieces of output variables that is total loans granted to related parties by both the bank and is not associated with the bank (Q1) and the securities held by bank (Q2) with 2 pieces of input variables is the total cost of interest paid on bank deposits by third parties or deposits (P1) and labor costs (P2). All variables are presented as a ratio to total assets. The results of this study indicate that the most efficient bank group is the group BUSN Non-Foreign Exchange and Foreign Exchange BUSN bank group, and the last state-owned banks (Hartono, 2009).

Suswandi researching on the analysis of the efficiency of Islamic banking in Indonesia by the method of Stochastic Frontier Approach (SFA) from the period January 2003 to December 2006. Determination of input and output in this study using value added approach. Input consists of deposits fund and paid-in capital. While the output consists of placements funds in Bank Indonesia, placements funds in other banks, and financing provided. Here the researchers execute a regression of the input variables and output to the level of efficiency. In this study, the efficiency of Islamic banks are based on the ability of Islamic banks generate profit of the inputs and outputs are used, thus the term profit in this study is to have the same meaning.
The result of study states that the input and output variables affect the profits of Islamic banking. Magnitude of the effect of 53.79%. During the study period of sharia banking in Indonesia has an average total efficiency of 94.37% per year. And based on partial test results can be seen that in this study, the variables used there is no effect on earnings of Islamic banking. These variables are the deposits fund and placements funds in other banks. While the variables that affect earnings in Islamic banking is the capital paid up, placements funds in Bank Indonesia, and the financing provided (Suswadi, 2007).

3. Research Methodology

Object of research in this paper is the Monthly Financial Report of the Syariah Commercial Bank in Indonesia, that is Bank Muamalat Indonesia, Bank Syariah Mandiri and Bank Mega Syariah period January 2008 through September 2010. The data used in the form of quantitative data type and based on the source data, this study used secondary data, that data obtained from information published financial statements by Bank Indonesia in January 2008 to September 2010.

In this study, the determination of input and output using Asset Approach as used by Muliaman D. Hadad in his research, so that the input and output variables are determined as follows:

a. Input Variables (X) : Personnel Expenses (P1) and Cost-Sharing Expenses (P2).
b. Output Variables (Y) : Total Financing (Q1) and Securities which Owned (Q2)

It is known that all data input and output is in the form of a ratio to total assets. This is so the data is not very noticeable difference between the larger banks with relatively smaller banks. In summary, the variables in this study can be summarized in the following table.

<table>
<thead>
<tr>
<th>Type Variabel</th>
<th>Indicator</th>
<th>Indicator Definition</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent</td>
<td>TC</td>
<td>Total Cost</td>
<td>Rasio</td>
</tr>
<tr>
<td>Independent</td>
<td>P1</td>
<td>Personnel Expenses</td>
<td>Rasio</td>
</tr>
<tr>
<td>Independent</td>
<td>P2</td>
<td>Cost-Sharing Expenses</td>
<td>Rasio</td>
</tr>
<tr>
<td>Independent</td>
<td>Q1</td>
<td>Total Financing</td>
<td>Rasio</td>
</tr>
<tr>
<td>Independent</td>
<td>Q2</td>
<td>Securities which Owned</td>
<td>Rasio</td>
</tr>
</tbody>
</table>

In this paper used the calculation of the efficiency of Islamic banks in terms of costs by using the method of approach cost efficiency, while for the calculations using the method of approach the stochastic frontier approach (SFA) to calculate the deviation of the cost function estimated in advance with its profit frontier.

Cost efficiency is defined as the ratio between the minimum cost which the company can produce a certain output, with the actual costs that incurred by the banking company. The smaller the actual costs are used compared with the minimum cost, then the level of cost efficiency of banks will be even greater.

3.1. Stochastic Frontier Approach

SFA method was developed by Aigner, Lovell, Schmidt (1977). In this method, the cost of a bank's modeled for deviation of its cost efficiency frontier due to random noise and inefficiency. Standard function of stochastic cost frontier has the general form (log) as follows:

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\[ \ln C_i = f(\ln X_{ji}, \ln Y_{ki}) + e_i \] ............................... (3.1)

Where:
- \( C_i \) = Total cost of bank n
- \( X_{ji} \) = Input j of bank n
- \( Y_{ki} \) = Output k of bank n
- \( e_i \) = Error

\( e_i \) consist of 2 functions:
\[ e_i = u_i + v_i \] ............................... (3.2)

Where:
- \( u_i \) = error factor that can controlled.
- \( v_i \) = error factor that random characteristic that cannot controlled.

Assumption that \( v \) is distribution in normal \( N(0, \sigma^2_v) \) and \( u \) is distribution in half-normal, \( |N(0, \sigma^2_u)| \)
where \( u_{it} = (u_i \exp(-h(t-T)))^3 \) and \( h \) is parameter that will estimation.

Cost Efficiency is essentially measuring a bank's cost level compared with a bank that has the best operating cost (best practice bank's cost) that produces the same output with the same technology. Cost efficiency is the derivation of a cost function, eg the cost function with the general form of equation (log) as follows:
\[ \ln C = f(w, y) + e \] ................................................................. (3.3)

By using the stochastic cost frontier equation form of the cost equation can be written as follows:
\[ \ln C = f(w, y) + \ln u + \ln v \] ................................................................. (3.4)

Where:
- \( C \) = total cost atau cost efficiency
- \( w \) = total input
- \( y \) = total output
- \( u \) dan \( v \) = error

So, cost efficiency can be written as follows:
\[ \text{CEFF}_n = \frac{C_{\text{min}}}{C_n} \exp \left[ f\left( w^n, y^n \right) + \ln(u_{\text{min}}) \right] \cdot \frac{u_{\text{min}}}{u_n} \] ...........................(3.5)

3.2 Uji Asumsi Ordinary Least Square (OLS)
Contrast with other analysis tools, multiple linear regressions require very stringent test requirements. After multiple linear regression equation is formed, there should be some test classic assumptions, namely the normality test, autocorrelation test, heteroskedastisitas test, and multicollinearity test.

a. Normality Test
Normality test in this study aims to determine whether in a regression model, the dependent variable and independent variables have the data distribution is normal or not. A good regression model is a method by which data distribution normal or near normal. Normal PP Plot graphs can be used to detect the normality which compares the cumulative distributions of real data with the cumulative distribution of the normal distribution.
b. Autocorrelation Test
Autocorrelation is a correlation between the series of observations is arranged in order of time or place the order, or correlations that arise in itself. Autocorrelation test aims to test whether the linear regression model there is a correlation between the error in period t with bullies error in period t-1 (previous period). To detect the presence or absence of autocorrelation in a regression model tested using the Durbin Watson test (Test Dw) with the provisions:
1) There is positive autocorrelation, if the value of Dw below -2 (Dw < -2).
2) No autocorrelation occurs when the value Dw is between -2 and +2 or -2 ≤ Dw ≤ 2.
3) Occurs when the value Dw negative autocorrelation in the top 2 (Dw > 2).

c. Heteroskedastisity Test
Heteroskedastisitas test aims to test whether the regression model of the residual variance inequality occurred one observation to another observation. If the variance of the residuals of the observations to other observations fixed, then called Homoskedastisitas and if it is different or changing called Heteroskedastisitas. A good regression model is that Homoskedastisitas or did not happen Heteroskedastisitas. To detect the presence or absence Heteroskedastisitas by looking at the scatterplot graph.

d. Multicollinearity Test
Multicollinearity test aims to test whether the regression model there is correlation between independent variables. A good regression model should not happen correlation between independent variables. To detect there is or not multicollinearity in a regression model by looking at correlation between independent variables that indicated by tolerance number and variance inflation factor (VIP). If tolerance number > 0,10 and VIP < 10 that show there is Multicollinearity in regression models.

3.3. Statistic Test
Analysis of the cost function based on the cost frontier approach in this study was calculated by multiple regression method. Multiple regression analysis in this study are used to determine the extent to which the level of efficiency and determine whether there is influence between these two variables are independent variables and the dependent variable. To determine the influence of Personnel Expenses (P1), Cost-Sharing Expenses (P2), Total Financing (Q1) and Securities which Owned (Q2) to Total Cost (TC) used the regression equation as follows:

\[ CEFF = a + b_1 \ln P1 + b_2 \ln P2 + b_3 \ln Q1 + b_4 \ln Q2 + e_i \]  \hspace{1cm} (3.6)

Where:
- CEFF = Cost Efficiency of Islamic Banking
- P1 = Personnel Expenses
- P2 = Cost-Sharing Expenses
- Q1 = Total Financing
- Q2 = Securities which Owned

Said to be efficient if each parameter has a number close to 1 or 100%. Conversely, if close to 0 indicates that the lower the efficiency. Proving the hypothesis made by coefficient of determination (R²), Simultaneous Test (Test F-statistics) and the Partial Test (Test t-Statistics).
4. Analysis

4.1. Analysis of Efficiency

By using methods of Stochastic Frontier Approach (SFA) with panel data model, the efficiency of each of the Syariah Commercial Bank can be measured. The panel data is intended to consider the period of observation of a bank and will result in efficiency levels based on the study period that is during the period January 2008 to September 2010.

Efficiency levels were analyzed from the model cost function with the dependent variable total cost / total cost (TC), the input which consists of personnel expenses (P1) and cost-sharing expenses (P2), while the output variable is the total financing (Q1) and securities which owned (Q2). All using the data to total assets ratio.

The resulting cost function is in the form of a model which is the frontier translog model rather than a linear model or a straight line, therefore all the variables in this research that TC, P1, P2, Q1, and Q2 changed in the form ln (Kumbhakar, 2003 - in Edy Hartono). With regression SFA model is formulated as follows:

\[
\ln C_i = f(\ln X_{ji}, \ln Y_{ki}) + e_i \quad \text{(4.1)}
\]

Where \( C_i \) is the total cost for the \( i \)-th time, \( X \) is the input to the \( i \)-th time, \( Y \) is output at the \( i \)-th time, and \( e \) is the error.

While for the calculation of efficiency, researchers used the approach to cost efficiency is defined as follows:

\[
\text{CEFF}_n = \frac{C_n}{C_{\text{min}}} = \frac{\text{exp}\left[f_c(w^n y^n) + \ln(u_{\text{min}})\right]}{u_{\text{min}}} \quad \text{(4.2)}
\]

By entering the input variables and output variables that have been assigned to the regression model, SFA equation can be rewritten as:

\[
\ln TC = a + b_1 \ln P1 + b_2 \ln P2 + b_3 \ln Q1 + b_4 \ln Q2 + e_i \quad \text{(4.3)}
\]

Where:
- \( TC \) = Total Cost
- \( P1 \) = Personnel Expenses
- \( P2 \) = Cost-Sharing Expenses
- \( Q1 \) = Total Financing
- \( Q2 \) = Securities which Owned
- \( e_i \) = error

To perform data processing with regression, researchers using SPSS 17 software programming. As follow the results of the efficiency of each bank.

a. Bank Muamalat Indonesia

Form of the model in predicting bank cost efficiency can be written as follows:

\[
\ln TC = 0.712 - 0.007 \ln P1 + 1.126 \ln P2 + 0.407 \ln Q1 - 0.070 \ln Q2
\]

In the regression equation above, the TC is constant at 0.712. This means if the input variables and output variables are considered constant (fixed or considered 1) the Bank Muamalat Indonesia will issue a minimum cost for a particular output level that is equal to 2.038063 million of total assets \((e^x 0.712 = 2.038063)\). By entering data into the formula 4.2 above, the cost efficiencies gained Bank Muamalat Indonesia as shown in Table 4.1 below:
Tabel 4.1. Efficiency Level in Bank Muamalat Indonesia

<table>
<thead>
<tr>
<th>Period</th>
<th>Efficiency</th>
<th>Period</th>
<th>Efficiency</th>
<th>Period</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-2008</td>
<td>0.995763</td>
<td>Des-2008</td>
<td>0.942652</td>
<td>Nov-2009</td>
<td>0.931888</td>
</tr>
<tr>
<td>Feb-2008</td>
<td>0.991278</td>
<td>Jan-2009</td>
<td>0.995158</td>
<td>Des-2009</td>
<td>0.93708</td>
</tr>
<tr>
<td>Mar-2008</td>
<td>0.986874</td>
<td>Feb-2009</td>
<td>0.98959</td>
<td>Jan-2010</td>
<td>0.996131</td>
</tr>
<tr>
<td>Apr-2008</td>
<td>0.983037</td>
<td>Mar-2009</td>
<td>0.985407</td>
<td>Feb-2010</td>
<td>0.991608</td>
</tr>
<tr>
<td>Mei-2008</td>
<td>0.977919</td>
<td>Apr-2009</td>
<td>0.978934</td>
<td>Mar-2010</td>
<td>0.985698</td>
</tr>
<tr>
<td>Jun-2008</td>
<td>0.972575</td>
<td>Mei-2009</td>
<td>0.972765</td>
<td>Apr-2010</td>
<td>0.981066</td>
</tr>
<tr>
<td>Jul-2008</td>
<td>0.969548</td>
<td>Jun-2009</td>
<td>0.967707</td>
<td>Mei-2010</td>
<td>0.975934</td>
</tr>
<tr>
<td>Agst-2008</td>
<td>0.963693</td>
<td>Jul-2009</td>
<td>0.959515</td>
<td>Jun-2010</td>
<td>0.97173</td>
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<td>Sep-2008</td>
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<td>Jul-2010</td>
<td>0.969908</td>
</tr>
<tr>
<td>Okt-2008</td>
<td>0.954377</td>
<td>Sep-2009</td>
<td>0.943034</td>
<td>Agst-2010</td>
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<tr>
<td>Nov-2008</td>
<td>0.948206</td>
<td>Okt-2009</td>
<td>0.937727</td>
<td>Sep-2010</td>
<td>0.963035</td>
</tr>
</tbody>
</table>

It is known that the average level of cost efficiency in Bank Muamalat Indonesia in the period January 2008 until September 2010 that is equal to 0.969545, or 96.95%. While the highest cost efficiency occurred in the period January 2010 that is equal to 0.996131, or 99.61%. As well as the lowest cost efficiency occurred in the period November 2009 that is equal to 0.931888, or 93.19%.

b. Bank Syariah Mandiri

Form of the model in predicting bank cost efficiency can be written as follows:

\[ \ln TC = 1.864 + 2.875 \ln P1 + 2.210 \ln P2 + 1.791 \ln Q1 - 0.765 \ln Q2 \]

In the regression equation above, the TC is constant at 1,864. This means if the input variables and output variables are considered constant (fixed or considered 1) the Bank Syariah Mandiri will issue a minimum cost for a particular output level that is equal to 6,449.483 million of total assets (e^{1.864} = 6,449.483). By entering data into the formula 4.2 above, the cost efficiencies gained Bank Syariah Mandiri as shown in Table 4.2 below:

Tabel 4.2. Efficiency Level in Bank Syariah Mandiri

<table>
<thead>
<tr>
<th>Period</th>
<th>Efficiency</th>
<th>Period</th>
<th>Efficiency</th>
<th>Period</th>
<th>Efficiency</th>
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<tbody>
<tr>
<td>Jan-2008</td>
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<td>0.947537</td>
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<td>Feb-2008</td>
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<td>0.953341</td>
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<td>Mar-2008</td>
<td>0.973038</td>
<td>Feb-2009</td>
<td>0.989971</td>
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<td>Apr-2008</td>
<td>0.967658</td>
<td>Mar-2009</td>
<td>0.986445</td>
<td>Feb-2010</td>
<td>0.989391</td>
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<tr>
<td>Mei-2008</td>
<td>0.963896</td>
<td>Apr-2009</td>
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<td>Agst-2008</td>
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<td>Okt-2008</td>
<td>0.945674</td>
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<td>0.963507</td>
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</table>

It is known that the average level of cost efficiency in Bank Syariah Mandiri in the period January 2008 until September 2010 that is equal to 0.969161 or 96.92%. While the highest cost efficiency occurred in the period January 2010 that is equal to 0.993922 or 99.39%. As well as the lowest cost efficiency occurred in the period October 2008 that is equal to 0.945674 or 94.57%.
c. Bank Mega Syariah

Form of the model in predicting bank cost efficiency can be written as follows:

\[
\ln TC = 0.423 + 0.857 \ln P1 + 0.151 \ln P2 - 0.083 \ln Q1 - 0.122 \ln Q2
\]

In the regression equation above, the TC is constant at 0.423. This means if the input variables and output variables are considered constant (fixed or considered 1) the Bank Mega Syariah will issue a minimum cost for a particular output level that is equal to 1,526534 million of total assets \( e^{0.423} = 1,526534 \). By entering data into the formula 4.2 above, the cost efficiencies gained Bank Mega Syariah as shown in Table 4.3 below:

<table>
<thead>
<tr>
<th>Period</th>
<th>Efficiency</th>
<th>Period</th>
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<td>Mei-2009</td>
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<td>Apr-2010</td>
<td>0.953171</td>
</tr>
<tr>
<td>Jul-2008</td>
<td>0.956591</td>
<td>Jun-2009</td>
<td>0.945021</td>
<td>Mei-2010</td>
<td>0.940891</td>
</tr>
<tr>
<td>Agst-2008</td>
<td>0.959361</td>
<td>Jul-2009</td>
<td>0.936166</td>
<td>Jun-2010</td>
<td>0.929538</td>
</tr>
<tr>
<td>Sep-2008</td>
<td>0.953479</td>
<td>Agst-2009</td>
<td>0.929333</td>
<td>Jul-2010</td>
<td>0.917393</td>
</tr>
<tr>
<td>Okt-2008</td>
<td>0.947281</td>
<td>Sep-2009</td>
<td>0.919454</td>
<td>Agst-2010</td>
<td>0.903227</td>
</tr>
<tr>
<td>Nov-2008</td>
<td>0.937310</td>
<td>Okt-2009</td>
<td>0.909359</td>
<td>Sep-2010</td>
<td>0.886689</td>
</tr>
</tbody>
</table>

It is known that the average level of cost efficiency in Bank Mega Syariah in the period January 2008 until September 2010 that is equal to 0.949262 or 94.93%. While the highest cost efficiency occurred in the period January 2008 that is equal to 0.994680 or 99.47%. As well as the lowest cost efficiency occurred in the period September 2010 that is equal to 0.886689 or 88.67%.

### 4.2. Ordinary Least Square (OLS) Assumption Test

a. Normality Test

From Normal Plot a graph of P which is a normality test results, it can be concluded that the research data on third-BUS distributed normally and meet the test of data normality.

b. Autocorrelation Test

From the autocorrelation test results can be concluded that there is no autocorrelation. This is because all of the Durbin-Watson value is between -2 and +2, so it can be said that the three banks in the regression model contains no autocorrelation.

c. Heteroskedasticitas Test

From the scatterplot diagram which is heteroskedasticitas test results, it can be concluded that the regression model on all three banks have been free of symptoms heteroskedasticitas.

d. Multicollinearity Test

Based on the multicollinearity test of each bank, it is known that the independent variables on Bank Muamalat Indonesia and Bank Syariah Mandiri had been around multicollinearity problems. While the independent variables on Bank Mega Syariah no multicollinearity problems.
4.3. Statistic Test

a. Coefficient Determine Test ($R^2$)

Statistically to determine the effect of independent variables simultaneously on the dependent variable can be seen from the large multiple correlation coefficient or $R^2$. The following test results from each $R^2$ banks sharia.

<table>
<thead>
<tr>
<th>Table 4.4. Result of Coefficient Determine Test ($R^2$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
</tr>
</tbody>
</table>

Bank Muamalat Indonesia value of the coefficient of determination from the regression model is equal to 0.899 or 89.9%, which shows the independent variables (personnel expenses, cost-sharing expenses, total financing, and securities which owned) simultaneously affect the dependent variable (total cost) of 89.9% and the remaining 10.1% influenced by other variables who are not included in the research model.

Bank Syariah Mandiri value of the coefficient of determination from the regression model is equal to 0.928 or 92.8%, which shows the independent variables (personnel expenses, cost-sharing expenses, total financing, and securities which owned) simultaneously affect the dependent variable (total cost) of 92.8% and the remaining 7.2% influenced by other variables who are not included in the research model.

Bank Mega Syariah value of the coefficient of determination from the regression model is equal to 0.923 or 92.3%, which shows the independent variables (personnel expenses, cost-sharing expenses, total financing, and securities which owned) simultaneously affect the dependent variable (total cost) of 92.3% and the remaining 7.7% influenced by other variables who are not included in the research model.

b. Test F-statistics

To determine the significance of the influence of all independent variables simultaneously on the dependent variable used F test, ie by comparing $F_{hitung}$ generated by multiple linear regression with $F_{tabel}$ in the significant level of 95% ($\alpha = 5\%$). Here are the results of F test from each of the Islamic banks.

In Bank Muamalat Indonesia, from the F test results $F_{hitung}$ obtained for 62.106 greater than $F_{tabel}$ in the level $\alpha = 5\%$, df$_1$ = 4 and df$_2$ = 28, obtained $F_{tabel}$ of 2.71. Because $F_{hitung}$ larger than $F_{tabel}$, so $H_0$ is rejected and $H_a$ accepted.

And at Bank Syariah Mandiri, the F test results obtained for $F_{hitung}$ 89.670 is greater than $F_{tabel}$ with level $\alpha = 5\%$, df$_1$ = 4 and df$_2$ = 28, obtained $F_{tabel}$ of 2.71. Because $F_{hitung}$ larger than $F_{tabel}$, so $H_0$ is rejected and $H_a$ accepted.

And the Bank Mega Syariah, the F test results $F_{hitung}$ obtained for 83.544 greater than $F_{tabel}$ in the level of $\alpha = 5\%$, df$_1$ = 4 and df$_2$ = 28, obtained $F_{tabel}$ of 2.71. Because $F_{hitung}$ larger than $F_{tabel}$ then $H_0$ is rejected and $H_a$ accepted.
c. Test t-Statistics

t-test used to test the strength of the relationship of each independent variable on the dependent variable individually. By comparing the values obtained \( t_{\text{hitung}} \) with \( t_{\text{table}} \) of each variable using 95% significant level (\( \alpha = 5\% \)). Here are the results of the t test of each bank's sharia:

1) Bank Muamalat Indonesia

t-test on the variable personnel expenses by using two-way test then the \( \alpha / 2 = 0.05 / 2 = 0.025 \), where df = \( n - 2 = 30 \), then obtained \( t_{\text{table}} = 2.042 \). Because \( t_{\text{hitung}} < t_{\text{table}} \) (0.932 < 2.042), the personnel expenses variable statistically not significant effect on cost efficiency. That is, the personnel expenses do not affect to the cost efficiency of the Bank Muamalat Indonesia.

\[ t_{\text{hitung}} < t_{\text{table}} \]

\[ (0.932 < 2.042) \]

The personnel expenses statistically not significant effect on cost efficiency. That is, the personnel expenses do not affect to the cost efficiency of the Bank Muamalat Indonesia.

\[ \text{t-test at variable cost-sharing expenses by using two-way test then the } \alpha / 2 = 0.05 / 2 = 0.025, \text{ where df = } n - 2 = 30, \text{ then obtained } t_{\text{table}} = 2.042. \]

\[ t_{\text{hitung}} > t_{\text{table}} \]

\[ (-5.393 > -2.042) \]

The cost-sharing expenses variable statistically significant results on cost efficiency. That is, the cost-sharing expenses affect negatively to cost efficiency in Bank Muamalat Indonesia.

\[ \text{t-test on the variables of total financing by using two-way test of the } \alpha / 2 = 0.05 / 2 = 0.025, \text{ where df = } n - 2 = 30, \text{ then obtained } t_{\text{table}} = 2.042. \]

\[ t_{\text{hitung}} < t_{\text{table}} \]

\[ (1.957 < 2.042) \]

The total financing variable statistically not significant to cost efficiency. That is, the total financing has no effect on cost efficiency in Bank Muamalat Indonesia.

\[ \text{t-test on variable securities which owned by using two-way test of the } \alpha / 2 = 0.05 / 2 = 0.025, \text{ where df = } n - 2 = 30, \text{ then obtained } t_{\text{table}} = 2.042. \]

\[ t_{\text{hitung}} < t_{\text{table}} \]

\[ (1.106 < 2.042) \]

The securities which owned variable statistically no significant effect on cost efficiency. That is, securities which owned has no effect on cost efficiency in Bank Muamalat Indonesia.

2) Bank Syariah Mandiri

t-test on the variable personnel expenses by using two-way test then the \( \alpha / 2 = 0.05 / 2 = 0.025 \), where df = \( n - 2 = 30 \), then obtained \( t_{\text{table}} = 2.042 \). Because \( t_{\text{hitung}} > t_{\text{table}} \) (4.545 > -2.042) then the variable personnel expenses statistically significant on cost efficiency. That is, the personnel expenses have a negative affect on cost efficiency of the Bank Syariah Mandiri.

\[ t_{\text{hitung}} > t_{\text{table}} \]

\[ (4.545 > -2.042) \]

The personnel expenses statistically significant on cost efficiency. That is, the personnel expenses have a negative affect on cost efficiency of the Bank Syariah Mandiri.

\[ \text{t-test at variable cost-sharing expenses by using two-way test then the } \alpha / 2 = 0.05 / 2 = 0.025, \text{ where df = } n - 2 = 30, \text{ then obtained } t_{\text{table}} = 2.042. \]

\[ t_{\text{hitung}} > t_{\text{table}} \]

\[ (3.144 > 2.042) \]

The cost-sharing expenses statistically significant on cost efficiency. That is, the cost-sharing expenses have a positive effect on cost efficiency in Bank Syariah Mandiri.

\[ \text{t-test on variables of total financing by using two-way test of the } \alpha / 2 = 0.05 / 2 = 0.025, \text{ where df = } n - 2 = 30, \text{ then obtained } t_{\text{table}} = 2.042. \]

\[ t_{\text{hitung}} < t_{\text{table}} \]

\[ (-4.387 < -2.042) \]

The total financing variable statistically significant effect on cost efficiency. That is, the total financing has negative affect on cost efficiency in Bank Syariah Mandiri.

\[ \text{t-test on variable securities which owned by using two-way test of the } \alpha / 2 = 0.05 / 2 = 0.025, \text{ where df = } n - 2 = 30, \text{ then obtained } t_{\text{table}} = 2.042. \]

\[ t_{\text{hitung}} < t_{\text{table}} \]

\[ (0.683 < 2.042) \]

The securities which owned variable statistically no significant effect on cost efficiency. That is, securities which owned has no effect on cost efficiency in Bank Syariah Mandiri.
3) Bank Mega Syariah

t-test on the variable personnel expenses by using two-way then the $\alpha / 2 = 0.05 / 2 = 0.025$, where $df = n - 2 = 30$, then obtained $t_{table} = 2.042$. Because $t_{hitung} > t_{table}$ ($-7.208 > -2.042$) then the variable personnel expenses statistically significant on cost efficiency. That is, the personnel expenses has negative affect the efficiency of the Bank Mega Syariah.

T-test on variable cost-sharing expenses by using two-way then the $\alpha / 2 = 0.05 / 2 = 0.025$, where $df = n - 2 = 30$, then obtained $t_{table} = 2.042$. Because $t_{hitung} < t_{table}$ ($-1.601 < -2.042$), then the variable cost-sharing expenses statistically no significant effect on cost efficiency. That is, the cost-sharing expenses has no effect on cost efficiency in Bank Mega Syariah.

T-test on the variables of total financing by using two-way test of the $\alpha / 2 = 0.05 / 2 = 0.025$, where $df = n - 2 = 30$, then obtained $t_{table} = 2.042$. Because $t_{hitung} > t_{table}$ ($4.279 > 2.042$) then the variable total financing is statistically significant on cost efficiency. That is, the total financing has a positive effect on cost efficiency in Bank Mega Syariah.

T-test on variable securities which owned by using two-way test of the $\alpha / 2 = 0.05 / 2 = 0.025$, where $df = n - 2 = 30$, then obtained $t_{table} = 2.042$. Because $t_{hitung} > t_{table}$ ($5.122 > 2.042$) then the variable securities which owned statistically significant on cost efficiency. That is, the securities which owned has a positive effect on cost efficiency in Bank Mega Syariah.

5. Conclusions and recommendations

5.1. Conclusions

During the period January 2008 until September 2010 the average level of the largest cost efficiency of Islamic Banks in Indonesia is on Bank Muamalat Indonesia amounting to 96.95%. The average level of cost efficiency of Bank Syariah Mandiri of 96.92%. At Bank Mega Syariah average cost efficiency level that is equal to 94.93%.

The hypothesis of this study which states that there is influence between component inputs (personnel expenses and cost-sharing expenses) and output (total financing and securities which owned) to the level of cost efficiency simultaneously, can be accepted. Where the Bank Muamalat Indonesia amounting to 89.9% and its influence on the Bank Syariah Mandiri influence 92.8%, and the Bank Mega Syariah effect of 92.3%.

Based on partial test (t test) that the Bank Muamalat Indonesia variables inputs and outputs that affect to the level of cost efficiency only cost-sharing expenses, cost-sharing expenses on Bank Muamalat Indonesia has a negative effect on the level of cost efficiency.

At Bank Syariah Mandiri all input variables and output affects the level of cost efficiency, except for securities which owned variable that does not affect the level of cost efficiency of banks. Personnel expenses variable has a negative influence, the cost-sharing expenses have a positive influence, and the total financing has a negative effect on the level of cost efficiency of banks.

At Bank Mega Syariah except for variable cost-sharing expenses had no effect on the level of cost efficiency of banks; all other variables have an influence. Personnel expenses has a negative effect, the total financing has a positive influence, and securities which owned also have a positive influence on the level of bank cost efficiency.
5.2. Recommendations

It is hoped the management of the BMI, BSM, and BMS to continue to raise the level of cost efficiency, because from the cost is still no funds are not used efficiently. It can be seen from the level of cost efficiency that has not reached 100%. Islamic banks should be more rational in the middle of the competition is also tougher.

Benefits should continue to become as a capital, so the growth of Islamic banks will be greater. With so many wasted costs, the profits of Islamic banks will be minor because the profits are used to cover existing costs without any benefit from the expenditure of these costs.

Therefore, Islamic banks to be more varied in developing its products and services are further enhanced on-line system, because the bank system would be more effective in carrying out its activities with costs are also less.

6. References: