THE MEASUREMENT OF EFFICIENCY AND FACTORS THAT AFFECT INDONESIA SHARIA INSURANCE EFFICIENCY

Nirwana Fauziah  
Faculty of Economic Management, Institut Pertanian Bogor

Heti Mulyati  
Wita Juwita Ermawati  
Department of Management, Institut Pertanian Bogor

Abstract: This study examines the efficiency level of Sharia Insurance in Indonesia from 2014 to 2017. In addition, to the factors that influence the efficiency of Sharia Insurance companies. Identifies of measurements using the DEA (Data Envelopment Analysis) method, the efficiency mean ($x$) of Sharia General Insurance results is higher than Sharia Life Insurance. The efficiency of Sharia General Insurance is at 82% categorized as high efficiency, whereas Sharia Life Insurance is at 75% and categorized as a medium efficiency. After obtaining the Sharia General Insurance and Sharia Life Insurance efficiency the variable was analyzed using the Tobit regression method with solvency ratios variable and company size. After partial processing, the results show that the solvency ratio has a negative and not significant effect while the size of the company’s variables has a positive and not significant effect on Sharia General Insurance. In Sharia Life Insurance the solvency ratio variable influences negatively and is not significant. Whereas the size of the company is also positive and insignificant. After that, in the third stage to study non-financial factors that improve efficiency, the questionnaire was distributed to 50 respondents and processed using multiple linear regression models with variable Y, the efficiency and variable X, Technology, and Innovation. The results find that technology variables did not affect efficiency while innovation significantly increases efficiency. The higher the level of innovation, the higher the level of company efficiency.

Keywords: Efficiency, Sharia Insurance, DEA, Tobit Regression, Solvency Ratio, Company Size


Sharia Insurance companies have been growing from 2011 to 2017. The percentage increases in the number of Islamic insurance companies by 6.66% in the year. Sharia insurance companies are divided into 6 (six) categories: 1) life insurance companies based on sharia principles, 2) loss insurance companies based on sharia principles, 3) life insurance companies with sharia business units, 4) loss insurance companies with sharia business units, 5) reinsurance companies based on sharia principles and 6) reinsurance companies with sharia business
units. In December 2017, the number of sharia insurance in Indonesia increased to 63 companies than in 2016. The number of sharia insurance companies by category can be seen in Table 1.

Other than the number of companies that tend to increase, the total assets of Islamic insurance increased as well. The total assets in December 2017 in the amount of 40,520 (billion IDR).

The total assets of Islamic insurance increased as well. The total assets in December 2017 in the amount of 40,520 (billion IDR).

Table 1 Data of Indonesia sharia insurance company, 2011-2017

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Life insurance companies based on sharia principles</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Loss insurance companies based on sharia principles</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Life insurance companies with sharia business units</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td>4</td>
<td>Loss insurance companies with sharia business units</td>
<td>18</td>
<td>20</td>
<td>24</td>
<td>23</td>
<td>25</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>Reinsurance companies based on sharia principles</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Reinsurance companies with sharia business units</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>43</strong></td>
<td><strong>45</strong></td>
<td><strong>49</strong></td>
<td><strong>49</strong></td>
<td><strong>55</strong></td>
<td><strong>58</strong></td>
<td><strong>63</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Percentage Increase</strong></td>
<td>5 %</td>
<td>9 %</td>
<td>0 %</td>
<td>12%</td>
<td>5 %</td>
<td>9 %</td>
<td></td>
</tr>
</tbody>
</table>

Source: Otoritas Jasa Keuangan (2017)

Figure 1 Total assets and gross contribution of sharia insurance from 2017 to 2018

Whereas the number of gross contributions in December 2017 was 13,955 (Billion Rp), an increase of 12% from January 2017 which was 1,052 (Billion Rp). It indicates that Sharia insurance continues to grow and demanded by the public. Figure 1 shows the total assets and gross contribution of sharia insurance from 2017 to 2018.

With the rapid development, the competition of the Sharia insurance business in Indonesia is increasingly competitive, both from life insurance and loss or general insurance based on sharia principles. In 2017, general insurance and loss insurance companies had several Sharia business units. Sharia insurance products owned by a life insurance company or a loss by having a Sharia business unit likewise. The more insurance companies that open Sharia business units, do not necessarily signify that the sharia insurance indicates efficiently.

In January 2018, the total assets of the conventional insurance coverage up to January 2018 of Rp 1,151 (Billion) as the Sharia insurance total assets amounted to Rp 41,877 (Billion). It can point
out that conventional insurance has total assets greater than Sharia insurance. The performance of conventional insurance companies is of higher contrast to sharia insurance. From such high performance can be stated that conventional insurance companies are more efficient than sharia insurance.

Along with efficiency measurements, another important thing to study is the factors that affect that efficiency. Every company should have a strategy for being able to compete with other companies. Another way is to maintain efficiency which means that the company should balance between the expenses and the revenue to make it was not a deficit. As for that, every company should know the factors that affect efficiency. The efficiency of the company is influenced by various factors, including solvency ratio, size, leverage, liquidity, tangibility, the volume of capital, and loss ratio.

One of the factors affecting the company’s efficiency rate is the solvency ratio. Furthermore, the size of the company is another factor that should be seen for knowing its effect on the efficiency of the company.

Based on the explanation above, the research needs to be done for measurement of sharia insurance efficiency during 2014-2017 using Two Stage Data Envelopment Analysis (DEA) approach as well as knowing the financial factors and Which affects the level of Sharia insurance efficiency in Indonesia. The DEA method is used for the purpose to understand how large the input affects the output. The DEA method calculates the distribution of values or efficiency scores, both based on input orientation and output orientation. The DEA can see a source of inefficiencies with a potential improvement of each input.

Based on the background description of the problem and the research questions above, the research objectives are:

1. Measuring the level of efficiency of Islamic insurance in Indonesia (63 companies)
2. Measuring and comparing the level of efficiency of life insurance companies that have Islamic business units and loss insurance companies that have Islamic Business Units
3. Analyzing the effect of the ratio of the level of solvency of company funds and company size to efficiency
4. Analyzing non-financial factors affect the efficiency of Islamic insurance in Indonesia. (technology and innovation)

This research is expected to provide the following benefits:

1. For researchers
   The results of this study are expected to be taken into consideration to increase awareness of the importance of insurance, especially sharia insurance. And can be used as a source of research data and can broaden the insight of researchers about Islamic insurance.

2. For Insurance Companies in Indonesia
   Islamic insurance companies need to calculate the level of efficiency regularly to make improvements to the variables that cause inefficient numbers are not optimal. Management can also compare efficiency with benchmarks.

3. For investors
   This research information will become a very important consideration for investors to invest their shares in an Islamic insurance company in Indonesia.

**METHOD**

There are 3 stages of this study: first, collecting financial report data from each Sharia insurance company consisting of 18 life insurance companies with Sharia business units and 23 general insurance companies with sharia business unit. However, the company that has complete data no more than 10 Sharia life insurance companies and 18 Sharia general insurance companies. A total of 63 Sharia insurance companies in Indonesia are not being the sample. This study looks for Sharia insurance companies in the form of Sharia business units.

Financial report Data consisting of input variables (assets, loads and claims payments) and outputs (TABARRU' and revenue funds) are processed with the DEA program which calculates the distribution of value or efficiency scores and performs a comparative analysis of the Efficiency score produced as identification of elements that cause
sharia or general Sharia insurance to be an efficient benchmark for other insurance companies.

Table 2  Input and Output Variables used in research

<table>
<thead>
<tr>
<th>Input Variable</th>
<th>Output Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset ($X_1$)</td>
<td>Revenue</td>
</tr>
<tr>
<td>Expenses ($X_2$)</td>
<td>Tabarru'</td>
</tr>
<tr>
<td>Claim Payment ($X_3$)</td>
<td></td>
</tr>
</tbody>
</table>

DEA efficiency values can be calculated with the following formula:

$$\text{Efficiency of } DMU_i = \frac{\sum_{j=1}^{p} m_j x_{ij}}{\sum_{k=1}^{m} v_k x_{ik}}$$

($k = \text{DMU to be evaluated}; m = \text{different inputs}; p = \text{different outputs}; x_{ij} = \text{DMU I I input value j}; m_i = \text{weight of DMU k for the evaluated DMU}; v_i = \text{weight of DMU I for the evaluated DMU}$).

The second stage is to analyze the panel data method, the data are analyzed using the Tobit method with a solvency ratio and company size. The regression equation will produce a relationship estimate that can be used to predict the level of output produced by a DMU at a certain level of input. The DMU will be considered efficient if it can produce more output than the estimated output.

The Tobit regression estimation model used in this study is:

$$EFT_i = \beta_1 Solv_i + Size_i + \epsilon_i$$

($EFT_1 = \text{Technical Efficiency Score obtained by the DEA method, the value is between 0 and 1; Solv = Company Solvency Ratio ; Size = company size / Asset (made in natural logarithm / Ln))$).

The third stage, by applying multiple regression analysis and supported by ordinary least square analysis as a measure for study feasibility. The research variables are independent, which is technology and innovation, while the dependent variable is the efficiency score. The research data was obtained by distributing questionnaires. The Measurement scale is in the form of a Likert scale from 1 to 5. After obtaining the results of the questionnaire distribution to 50 respondents then the data is processed with multiple regression to see how much effect of the independent variable (technology and innovation) and the dependent variable (efficiency).

The multiple regression equation in this study is contained in the following formula:

$$Y = a + b_1 X_1 + b_2 X_2 + e \text{ .................... (1)}$$

($Y = \text{Efficiency Score}; X_1 = \text{Technology}; X_2 = \text{Innovation}; a = \text{constant}; b = \text{Regression coefficient of variable X}; e = \text{Standard error}$).

Wijaya and Utama (2013) stated that the role of technology in business efficiency is the reduced level of mistakes made by workers in a company. Individuals needed by the company to develop the technology are quite expensive, but the company will get business efficiency which can be seen from the ratio of profits and capital invested. The hypothesis to be tested in this study are:

H1 : Technology influences a positive effect on the level of efficiency of Islamic insurance in Indonesia

The ultimate goal of engineering and innovation is to improve the efficiency of the company’s business processes, as well as maximize existing processes or assets and it is hoped that this will increase or increase the income of the company. There are three objectives of innovation according to Armistead and Roland (1996):

1. Shortening or speeding up a cycle
2. Increase income and reduce costs
3. Efficiency or optimization of a work process, increasing resource utilization, adding value to business processes, maximizing systems, policies, process structures in a company. The hypothesis to be tested in this study are:

H2 : Innovation affects positive effect on the level of efficiency of Islamic insurance in Indonesia
The Measurement of Efficiency and Factors that Affect Indonesia Sharia Insurance Efficiency

Solvency ratio is a measure of the ability of insurance to find sources of funds that aim to finance its activities or as a measuring tool to see the wealth of insurance to see efficiency for the insurance management. This ratio measures the company’s ability to meet its long-term obligations if the company is liquidated (Kasmir, 2004). The hypothesis to be tested in this study are:

**H3**: Solvency Ratio affects positive effect on the level of efficiency of Islamic insurance in Indonesia

The size of the company, in this case, is the size of the insurance company which is reflected in several aspects owned by the insurance company is one of the specific characteristics of the company which is generally a determinant of the efficiency of sharia insurance companies.

The smaller the size of the company, the higher the possibility for companies to be more efficient in utilizing inputs to produce more output (Islam et al., 2013).

(Surifah, 2011) revealed that large companies have better resources, lower transaction costs, and are more able to withstand competition and economic shocks. In other words, large companies or companies that have large assets tend to be more efficient. The hypothesis proposed in this study is:

**H4**: The size of the company affects positive effect on the level of efficiency of Islamic insurance in Indonesia

RESULTS

**Average Efficiency Value of Sharia General Insurance and Sharia Life Insurance**

Sharia Insurance efficiency estimation using the non-parametric Data Envelopment Analysis (DEA) method. All Sharia Insurance is combined using the DEA method will then get results in the form of efficiency values for each Sharia Insurance. The most efficient sharia insurance or which gets a value of 1 or 100 percent is the sharia insurance that being used as a benchmark for other less efficient sharia insurance. A Decision Making Unit (DMU) will be stated to have achieved relative efficiency if it reaches a score of 1 or 100 percent and is increasingly inefficient if it is further from a value of 1 or 100 percent. Here is an illustration of the value of the efficiency of Sharia General Insurance.

![Efficiency Chart](source)

Source: Analyzed by MaxDEA

**Figure 2** Average efficiency Value of Indonesia Sharia General Insurance and Sharia Life Insurance 2014-2017
Based on figures 2 and 3 it can be understood that Sharia General Insurance within the criteria of the highest efficiency value is PT Asuransi Bangun Askrida with an efficiency value of 100%, while for Islamic life insurance is PT Asuransi Panin Daichi Life and PT Prudential Life Assurance with efficiency values by 100%. The efficiency value of sharia life insurance is higher when compared to sharia general insurance. It can be concluded that the overall level of efficiency of Islamic life insurance is still higher when compared to the level of efficiency of Islamic general insurance.

Sharia General Insurance that comprised of the medium efficiency criteria is PT Asuransi Parolamas with an efficiency value of 65%, whereas sharia life insurance that falls under the low efficiency criteria is 45%.

**Overall Sharia Insurance Efficiency**

After identifying the average efficiency value of sharia general insurance and sharia life insurance, then the overall efficiency value is estimated representing the sharia general insurance and sharia life insurance.

1. The average efficiency of Sharia General Insurance

To estimate the overall average efficiency value is to add up all the efficiency values for the entire study period, then the average value shown in the following Table.

<table>
<thead>
<tr>
<th>Period</th>
<th>CRS Average</th>
<th>VRS Average</th>
<th>Scale Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>81%</td>
<td>86%</td>
<td>94%</td>
</tr>
<tr>
<td>2015</td>
<td>85%</td>
<td>91%</td>
<td>93%</td>
</tr>
<tr>
<td>2016</td>
<td>78%</td>
<td>89%</td>
<td>88%</td>
</tr>
<tr>
<td>2017</td>
<td>86%</td>
<td>93%</td>
<td>93%</td>
</tr>
</tbody>
</table>

Based on Table 3, the results indicate that a whole sharia general insurance in Indonesia has a CRS (Constant Return to Scale) average value of 83% classified as the high efficiency criteria, for VRS (Variable Return to Scale) has an average value of efficiency 90% and classified as the high efficiency criteria, and for Scale has an average efficiency value of 92% classified as the high efficiency criteria.

The table a graph is made to explain the development of the level of efficiency of Islamic general insurance during the study period, the results are in the following figure:
The Measurement of Efficiency and Factors that Affect Indonesia Sharia Insurance Efficiency

Based on the figures above, the average value of the technical efficiency of the VRS model has a higher value when compared to the average value of the technical efficiency of the CRS model. The lowest average value for the technical efficiency of the VRS model occurred in 2014 with a value of 86% and the highest average level of efficiency for the VRS model was 93% which occurred in 2017. The assumption of the VRS model is the addition of inputs x times will not cause output increases by x times, can be smaller or larger than x times. This indicates, to increase the efficiency level of sharia insurance from 93% to 100%, it does not have to increase or increase output by 7% because this does not guarantee that the level of efficiency increases by increasing the amount of output. Based on the criteria for evaluating the level of efficiency, then the value of 93% is included in the criteria of high efficiency.

Whereas the value of efficiency using the technical efficiency of the CRS model is obtained that the lowest average value of general Sharia insurance efficiency occurred in 2016 with a value of 62% classified as the low efficiency criteria, for VRS (Variable Return to Scale) has an average value efficiency of 76% is classified as the medium efficiency criteria, and for Scale has an average efficiency value of 81% classified as the high efficiency criteria.

Then based on the table above, a picture is made to explain the development or trend of the level of efficiency.

As being comprehended in the efficiency criteria table, the average value of the CRS model (83%), VRS (90%), and scale (92%) comprised in the high efficiency criteria.

2. The average efficiency of Indonesia Sharia Life Insurance

The average efficiency value of sharia life insurance can be understood from the following Table:

<table>
<thead>
<tr>
<th>Period</th>
<th>CRS Average</th>
<th>VRS Average</th>
<th>Scale Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>57%</td>
<td>68%</td>
<td>86%</td>
</tr>
<tr>
<td>2015</td>
<td>69%</td>
<td>84%</td>
<td>83%</td>
</tr>
<tr>
<td>2016</td>
<td>63%</td>
<td>77%</td>
<td>80%</td>
</tr>
<tr>
<td>2017</td>
<td>57%</td>
<td>74%</td>
<td>75%</td>
</tr>
</tbody>
</table>

Source: Analyzed by MaxDEA

Table 4 Average Efficiency of Sharia Life Insurance (CRS, VRS, dan Scale), 2014-2017

Based on the Table above, the results indicate that a whole Sharia Life Insurance in Indonesia has an average value for CRS (Constant Return to Scale) of 62% classified as the low efficiency criteria, for VRS (Variable Return to Scale) has an average value efficiency of 76% is classified as the medium efficiency criteria, and for Scale has an average efficiency value of 81% classified as the high efficiency criteria.

Then based on the table above, a picture is made to explain the development or trend of the level of efficiency.
efficiency of Sharia Insurance during the study period, the results are in the following graph:

Based on Figure 6, the average value of the technical efficiency of the VRS model has a higher value when compared to the average value of the technical efficiency of the CRS model. The lowest average value for the technical efficiency of the VRS model occurred in 2014 with a value of 68% and the highest average level of efficiency for the VRS model was 84% which occurred in 2015. Assuming the VRS model is the addition of inputs x times will not cause output increases by x times, it can be smaller or larger than x times. This points out, to increase the level of efficiency of Islamic Life Insurance from 84% to 100% it does not have to increase or increase output by 16% because this does not guarantee that the level of efficiency rising by increasing the amount of output. If being identified based on the criteria for evaluating the efficiency level, then the value of 84% is classified in the high efficiency criteria.

While the value of the technical efficiency of the CRS model is obtained that the lowest average value of sharia life insurance efficiency occurred in 2011 with a value of 57% and classified as low efficiency. While the highest average value of technical efficiency in the CRS model occurred in 2015 with a value of 69% and classified as the medium efficiency criteria. This CRS model assumes that the ratio between the addition of input and output is the same (constant return to scale). That is, if there is an additional input of x times, the output will increase by x times too. If being identified in the efficiency criteria table, the average value of the CRS model (62%), VRS (76%), and scale (81%) are classified in the medium efficiency criteria.

**Tobit Regression Results**

**Sharia General Insurance Tobit Regression Results**

Tobit Sharia General Insurance Regulations are carried out simultaneously and partially. Sharia General Insurance Tobit regression results that are carried out simultaneously can be identified in the following Table:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.789781</td>
<td>0.1187</td>
</tr>
<tr>
<td>Solvency Ratio</td>
<td>-0.003541</td>
<td>0.6646</td>
</tr>
<tr>
<td>LN_Size</td>
<td>0.004508</td>
<td>0.8198</td>
</tr>
</tbody>
</table>

Source: Analyzed by Eviews
Model Interpretation

Tobit method Panel data regression model can be understood as:

\[ \text{Efficiency of Sharia General Insurance} = 0.789781 - 0.003541 \times \text{SOLV} + 0.004508 \times \ln(\text{SIZE}) \]

From the panel data regression model using the Tobit method, it can be understood that the solvency level has a negative and insignificant effect which means Ho in hypothesis III is rejected. While the size has a positive and not significant effect on the efficiency level of sharia general insurance in Indonesia, so Ho in hypothesis IV is rejected.

Tobit Regression Solvency Ratio to the Efficiency of Sharia General Insurance

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.904933</td>
<td>0.0000</td>
</tr>
<tr>
<td>SOLV</td>
<td>-0.003323</td>
<td>0.6821</td>
</tr>
</tbody>
</table>

The regression results in Table 7 can be assumed that the solvency ratio has a negative and not significant effect on the level of efficiency of Sharia General Insurance in Indonesia. Thus, Ho in hypothesis III is rejected.

Company Size Tobit Regression on the Efficiency of Sharia General Insurance

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.371072</td>
<td>0.3051</td>
</tr>
<tr>
<td>Rasio Solvabilitas</td>
<td>0.005086</td>
<td>0.1262</td>
</tr>
<tr>
<td>LN_SIZE</td>
<td>0.027619</td>
<td>0.3214</td>
</tr>
</tbody>
</table>

Source: Analyzed by Eviews

Model Examination

Similar to the Sharia General Insurance model, Multicollinearity is being applied for the examination of the Sharia Life Insurance model.

From the multicollinearity conducted using a partial test with Eviews software (can be understood in appendix 5), the results show that the correlation coefficient between the independent variables in this study is in the range of numbers below 0.80, which is equal to -0.43 so it can be concluded that the data used in this study is there is no problem in multicollinearity.

Model Interpretation

Tobit method Panel data regression model can be understood as:

\[ \text{Efficiency of Sharia Life Insurance} = 0.371072 + 0.005086 \times \text{SOLV} + 0.027619 \times \ln(\text{SIZE}) \]

Based on the Tobit regression model, it can be understood that the solvency ratio has a positive and not significant effect on efficiency. The regression coefficient solvency level of 0.005086 has a positive and not significant effect so that Ho in hypothesis III is rejected (unacceptable). Whereas the firm size has a positive effect on efficiency and
Nirwana Fauziah, Heti Mulyati, Wita Juwita Ermawati

is not significant so H0 in hypothesis IV is rejected (unacceptable).

Tobit Regression Solvency Ratio to the Efficiency of Sharia Life Insurance

Table 10 Results of Tobit Regression Solvency Ratio to Efficiency in Sharia Life Insurance

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.727110</td>
<td>0.0000</td>
</tr>
<tr>
<td>SOLV</td>
<td>0.004915</td>
<td>0.1438</td>
</tr>
</tbody>
</table>

The regression results in Table 10 can be assumed that the solvency ratio has a positive and not significant effect on the level of efficiency of Sharia Life Insurance in Indonesia. Thus, Ho in hypothesis III is rejected.

Tobit Regression Company Size to the Efficiency of Sharia Life Insurance

Based on the regression results in Table 11 can be assumed that the size of the company has a positive and not significant effect on the efficiency level of Sharia Life Insurance in Indonesia. Thus, Ho in hypothesis IV is rejected.

Tobit Regression Company Size to the Efficiency of Sharia Life Insurance

Based on the regression results in Table 11 can be assumed that the size of the company has a positive and not significant effect on the efficiency level of Sharia Life Insurance in Indonesia. Thus, Ho in hypothesis IV is rejected.

Multiple Linear Regression Results

1. Simultaneous Test

Regression analysis can see the simultaneous effect or the joint effect of independent variables on the dependent variable or Y variable as well. The simultaneous test can be performed by using the F test. Following the hypothesis and the analysis results of the test using multiple linear regression:

\[ H_0 : \text{There is no joint effect on } Y \]

\[ H_1 : \text{There is a joint effect on } Y \]

ANOVA\textsuperscript{a,b}

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>39.747</td>
<td>2</td>
<td>19.874</td>
<td>19.341</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>50.349</td>
<td>49</td>
<td>1.028</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>90.096</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{a. Dependent Variable: Y}  
\textsuperscript{b. Weighted Least Squares Regression - Weighted by weight}  
\textsuperscript{c. Predictors: (Constant), X2, X1}

If the F-statistic value is greater than the F table or Prob is smaller than the alpha value (5%) then Ho is rejected. The results above show a prob value of 0.0000 whose value is smaller than alpha, the conclusion drawn is to reject Ho or there is a joint effect on Y or at least there is one of the independent variables that affect Y.

2. Partial Test

After identifying that the results of the F test indicate there is a joint effect or at least there is one independent variable that affects Y then proceed with the T-test to see which independent variables partially affect Y. Following the hypothesis and the results of the t-test
The Measurement of Efficiency and Factors that Affect Indonesia Sharia Insurance Efficiency

The company efficiency level is predicted by the following regression equation:

\[ \text{Company Efficiency Level} = 55.842 + 0.010X_1 + 0.074X_2 \]

Where:
- \( X_1 \) is Technology
- \( X_2 \) is Innovation

### Regression Model Interpretation

#### a. Technology
The technology produces a t-statistic value of 0.389 and a prob value of 0.699. This indicates the probability value is greater than alpha (5%) or Ho accepted. Technology does not affect the company’s efficiency level.

#### b. Innovation
Innovation produces a t-value of 3.901 and a prob value of 0.000. This indicates the prob value is smaller than alpha (5%) or Ho Rejected or Innovation has an effect on Y. The estimated value of 0.074 indicates that the higher the value of Innovation, the higher the company efficiency level.

### DISCUSSION

So that this research is more focused on the main problems examined, there are several reviews of the results of previous studies that become a reference for researchers in developing the analysis.

Rusydiana (2017) researched with the object of research taken was an insurance company that has financial statements from 2012-2016. In general, the main factor in the inefficiency of life insurance institutions in Indonesia from 2012 to 2016 is in terms of output. Other studies that show sharia insurance is inefficient is a study conducted by Tuffahati, et al (2016). There is no Islamic life insurance company that achieves optimal efficiency in three types of measurements. However, there is two optimal efficient sharia general insurance, which is 28.57%. There are four sharia unit life insurance companies that are optimally efficient. In that study, it did not analyze the claim payment variable which became the input variable and did not make tabarru funds’ as the output variable.

The same study by Benarda and Nadratuzzaman (2016) also found inefficient results at insurance companies. A total of 14 sharia life insurance in Indonesia has not been efficient. Tabarru fund solvency ratios’ have a positive and significant effect on technical efficiency and scale. In addition, Sabiti, et al. (2017), examined 14 sharia life insurance companies and 12 sharia general insurance in the 2013-2015 period taken from the financial statements of each company using the Data Envelopment Analysis (DEA) method. The results of his research indicate that sharia life insurance companies and sharia general insurance in Indonesia have not yet reached an efficient level. Islamic insurance companies must maximize the achievement of output with existing inputs.

Other research conducted by Harris and Katz (2015) stated that ICT has an important role in improving company performance. ICT Implementation gives higher productivity to the company, pro-
vide higher customer satisfaction, more value creation, to increase the benefits of ICT.

Every company management always expects the company to experience growth in their business activities. The growth is mainly in operating income and Tabarru funds that are in line with or exceeding the target set. The company management must be able to manage the company well to prevent inefficiency possibility in the company. One solution is to reduce operating costs and claim payments to increase company efficiency and maintain and improve the quality of productive assets using the precautionary principle.

From the results of this study, sharia general and sharia life insurance companies that have been efficient can be used as benchmarks for other insurance companies in formulating company policies so that they can be more efficient as the development of existing potential improvements for consideration of decision making. In addition, this research can be used by consumers as a material consideration for customers in choosing an insurance company.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Based on the results of the analysis, here are several conclusions of the study:

1. From the measurement of the efficiency value, it is obtained that on the average Sharia General Insurance is classified as the high efficiency category (it can be understood from the average efficiency of the VRS model (Variable Return to Scale) of 82%, although it has not yet reached the optimum efficiency value of 100%.

2. The efficiency value of sharia life insurance is classified as the medium efficiency category (can be understood from the average value of VRS (Variable Return to Scale) efficiency of 75%, even though it has not reached the optimum efficiency value of 100%.

3. In the regression using the Tobit method, the results of simultaneous regression for Sharia General Insurance, the solvency ratio results have a positive and not significant effect on efficiency. Likewise, the company’s size variable has a positive and not significant effect.

4. In the regression using the Tobit method, the results indicate that simultaneous regression for Sharia Life Insurance the result of the solvency ratio variable has a positive and not significant effect on efficiency. Likewise, the company’s size variable has a positive and not significant effect.

5. From multiple linear regression, the results indicate that technology does not affect the level of company efficiency. While Innovation affects Y, the higher the rating of Innovation, the higher the company efficiency level score.

Recommendation

Based on the study conclusions, here are the suggestions that can be recommended:

1. To achieve optimum efficiency Sharia general insurance companies should reduce claim payments.

2. To achieve efficiency values Sharia life insurance companies should increase income and tabarru funds.

3. For further research, it is better to increase the number of DMU (Decision Making Unit) of sharia general insurance and sharia life insurance to obtain more comprehensive results on the picture of sharia insurance companies.

REFERENCES


Harris, Sidney E. and Joseph L. Katz. 2015. Organizational Performance and Information Technology Investment Intensity in the Insurance Industry. Or-
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