Non-Performing Financing (NPF) and Cost Efficiency of Islamic Banks in Indonesia Period 2012Q1 to 2015Q2

Chandra Setiawan,
Management Study Program, Faculty of Business, President University, Indonesia.
E-mail: chandra@president.ac.id

Bhirawa Bagaskara,
Management Study Program, Faculty of Business, President University, Indonesia.
E-mail: bhirawa@gmail.com

Abstract
This paper investigates the inter-temporal relationships between non-performing financing (NPF) and cost efficiency of Islamic Banks in Indonesia period of 2012Q1 to 2015Q2. This research uses time series and quarterly-published report data of Central Bank of Indonesia (Bank Indonesia). The Data Envelopment Analysis (DEA) approach is used to measure cost efficiency of Islamic Banks. The inter-temporal relationship between NPF and cost efficiency is run using VAR model to test the two hypotheses of four hypotheses that are introduced by Berger and DeYoung (1997): ‘Bad Luck’ and ‘Bad Management’. The finding of DEA indicates that Bank Victoria Syariah (BVS) in the research period as the most cost efficient. The average cost efficiency of Islamic commercial banks is 0.937 or 93.7%. The finding also indicates that Islamic bank is still inefficient in managing the cost. This results support the ‘bad management’ hypothesis. The ‘bad management’ hypothesis indicates the major risks facing financial institution are caused by internal problem. In term of variables that determine NPF by using panel least square, the finding reveal that GDP growth rate, Inflation and Capital Adequacy Ratio (CAR) have a negative and significant effect toward NPF, while Exchange rate and Operational Efficiency Ratio (OER) have a positive and significant effect toward NPF. On the other hand, Financing Deposit Ratio (FDR) has no significant effect toward NPF.

Key Words: Cost Efficiency, Panel Least Square, Data Envelopment Analysis, ‘Bad Luck’ and ‘Bad Management’.
1. Introduction

As financial intermediaries, banks fundamentally have an important role in the economy. Bank is one of economic movers as its function to distribute the fund to the real sector. Indirectly, by providing capital, the Bank helps to improve business performance and decrease unemployment.

There are two types of bank in Indonesia: Conventional and Islamic bank. Islamic banks can be differentiated from conventional banks through three major aspects: foundation, management, and products. There are five major elements which give Islamic banking distinct compared to Conventional banking: Riba is prohibited in all transactions; business and investment are undertaken on the basis of halal (legally permitted), transactions should be free from gharar, (speculation or uncertainty) and maysir (gambling); zakat is to be paid by the bank to benefit society; and to ensure all activities in line with Islamic principles, shariah board supervises and advises the bank’s products. Islamic bank had existed in Indonesia since 1992, but due to lack of regulation, it is only one syariah Bank that operated. The first Islamic bank in Indonesia is Bank Muamalat Indonesia. Number of Islamic banks start to grow since Act number 21 of 2008 concerning Islamic Banking is issued. From that moment, many Islamic banks are established and grow fast until now. Based on bank Indonesia data in June 2015, there are 12 Islamic Banks (IB), 24 Islamic Business Units (IBU) and 161 Islamic Rural Banks with total office number 2,881. Total assets of Islamic Banks were 279,240 billion, which was increasing 179% from total assets in 2010.

However, this strong growth is followed by the increasing of credit risk in the past three years as reflected by Non-Performing Financing (NPF) ratio. Based on Islamic Banking Statistics published by Bank Indonesia from 2012 to June 2015, NPF of Islamic banks has gradually increased and getting closes to 5% which is maximum standard from BI. Unfortunately, on February 2015, NPF Islamic bank was at its pinnacle which was 5.10%, see the table 1 below.

The rising number of NPF urges the bank to increase provision for loan losses which may result to the capital deterioration (Firmansyah, 2014). The increasing number of syariah bank that operates in the form of Islamic Bank (IB) and Islamic business units (IBU) in Indonesia with variety products suggested the bank to carefully manage its credit risk, since the Bank essentially manage people funds. That is why it needs a further research to analyze the factors that affect NPF of Islamic Banks in Indonesia. Islamic Banks in Indonesia should be able to manage the cost of fund to be efficient and able to compete locally and regional in ASEAN countries. Thus, the improvement of cost efficiency can increase the competitiveness of Islamic Bank. This study intends to measure cost efficiency of Islamic Banks in Indonesia through Data Envelopment Analysis (DEA) with intermediate approach to find whether
Islamic banks in Indonesia has efficiently managing its cost or not. The question here is how NPF affects the bank efficiency. Karim et al. (2010) found that cost efficiency has a negative effect on NPL. The increase in NPL, decreases the cost efficiency.

This research is focusing on Islamic banks in Indonesia. By estimating the inter-temporal relationship between NPF and cost efficiency the researchers can determine whether an increase in financing problem has a negative impact toward cost efficiency, vice versa, the decrease of efficiency has a negative impact on the increase of NPF. The other objectives of this research is to determine the significant variables that affect the NPF of Islamic Banks in Indonesia and to examine the cost efficiency of Islamic Banks in Indonesia by using Islamic Banks’ inputs-outputs; also aimed to determine the inter-temporal relationship between NPF and cost efficiency of Islamic Banks in Indonesia.

This paper is structured as follows. Section 2 reviews the literature. Section 3 describes the data, sources, and methodology, which is employed in the study. The empirical results are available in section 4. Finally, we conclude in section 5.

Table 1: NPF Ratio of Islamic Banks and Islamic Business Unit (2012-2015)

<table>
<thead>
<tr>
<th>Month</th>
<th>NPF ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2012</td>
</tr>
<tr>
<td>January</td>
<td>2.68%</td>
</tr>
<tr>
<td>February</td>
<td>2.82%</td>
</tr>
<tr>
<td>March</td>
<td>2.76%</td>
</tr>
<tr>
<td>April</td>
<td>2.85%</td>
</tr>
<tr>
<td>May</td>
<td>2.93%</td>
</tr>
<tr>
<td>June</td>
<td>2.88%</td>
</tr>
<tr>
<td>July</td>
<td>2.92%</td>
</tr>
<tr>
<td>August</td>
<td>2.78%</td>
</tr>
<tr>
<td>September</td>
<td>2.74%</td>
</tr>
<tr>
<td>October</td>
<td>2.58%</td>
</tr>
<tr>
<td>November</td>
<td>2.50%</td>
</tr>
<tr>
<td>December</td>
<td>2.22%</td>
</tr>
</tbody>
</table>

Source: Islamic Banking Statistics published by Bank Indonesia

2. Literature Review

The previous study of non-performing loans (NPL) in conventional banks and non-performing financing (NPF) in Islamic banks and efficiency of the banking system has been found in several finance and banking research. The researchers used the previous research in Islamic banking as basis concept of this study.

2.1 Non-Performing Financing Determinants

Factors that impact NPF can be caused by components from internal and external factors. In order to find the causes, variable of external factors which will be used in this research are GDP growth rate, inflation, and exchange rate. Internal factors are taken from Capital
Adequate Ratio (CAR), Financing to Deposit (FDR), and Operational Expenses Ratio (OER). Firmansyah (2014) found that GDP has a negative and significant impact toward NPF. GDP growth rate is the indicator of economy growth in the country, therefore, when GDP growth rate increase, the ability of people to pay back the financing of Islamic banks is also increasing. Hence, the NPF ratio is decreasing. Rahmawan (2008) found that inflation has a positive and significant effect on NPF ratio. The increasing price of goods and services indicate the higher cost that people should spend. It means high inflation affects the decreasing of people purchasing power. The lower purchasing power can decrease the ability of people to payback their obligation to the bank, thus it raises NPF ratio. Based on Wikutama (2010), depreciation of rupiah relatively inflicts to the increasing value of credit that uses foreign currency. Exchange rate highly affects debtor that used foreign currency in its operation such as to import the raw material. When the market is volatile and the value of one currency changed to another currency, it will affect business operation. Moreover, when local currency is undervalued, companies with foreign currency loan will get high exposure. Total loan is increasing due to more local currencies is needed to be exchanged for the same number of foreign currencies. It will make customers balance deficit and increasing the possibility of customer unable to pay back its liability. According to Nugraini and Setijawan (2015), CAR has a significant and negative effect to NPF. When CAR of Islamic Bank is decreasing, it reflects the decreasing number of capital. The decreasing of capital is caused by the declining of profit or the increasing of risk-weighted assets. Profits are decreasing as the consequence of high problematic credit. Based on Ding Lu (2001) and cited by Padmantyo (2011), “over” credit demand that gives by Bank can increase the NPF ratio. Higher FDR shows the high amount of third party fund that transferred to financing activity. This condition causes the increasing probability of NPF if the fund is not properly handled. Thus, the high number of FDR may lead to the increasing of NPF. Based on Dendawijaya (2005), the higher number of OER indicates the lower efficiency of the bank. This inefficiency may lead to the trouble occurrence that bank should face such as the declining quality of financing and the increasing of NPF.

2.2 Bank Efficiency

Berger and Mester (1997) employed economic efficiency concepts - cost, revenue and standard profit, and alternative profit efficiencies. According to the both authors, the three concept of efficiency is the most important economic efficiency concepts. These concepts have the best economic foundation for analyzing the efficiency of financial institution. Based on Coelli et al. (1998) and Thanassoulis (2001) cited by (Bader, Mohamad, Ariff, & Hassan, 2008), cost efficiency gives a measure of how close a bank’s cost is to what a best-practice bank’s cost would be for producing the same bundle of outputs under the same conditions. This research will measure Islamic Banks’ cost efficiency through data envelopment analysis.
Cost efficiency can be measured by employing either a non-parametric or parametric approach. This research will use nonparametric approach through Data Envelopment Analysis (DEA). The reason for the researchers to use Data Envelopment Analysis is the advantage of DEA approach that no functional or distributional forms need to be specified; even though all deviations from the frontier are attributed to inefficiency since no allowance for noise is made (Thanassoulis, 2001). Based on Berger and De Young (1997), there are several hypotheses that relate NPF and cost efficiency such as are “bad management” and “bad luck” hypotheses. The “bad luck” hypothesis related to the consequences of the increasing bank risk on efficiency levels. According to “bad luck” hypothesis, the increasing non-performing loans is caused by an unexpected exogenous event (bad luck), such as economic slowdowns or firms’ breakdown. Banks will consequently incur higher costs in order to monitor these problem loans which impacted to the decreasing of efficiency. Whereas, in “bad management” hypothesis, poor management in the banking institutions results in bad quality loans, and therefore, escalates the level of non-performing loans.

3. Methodology

3.1 Research Questions

1. Does each variables of GDP growth rate, inflation, exchange rate (USD/IDR), CAR, FDR, and OER have a partial and simultaneous effect towards Non-Performing Financing (NPF) of Islamic banks during period 2012Q1 to 2015Q2?
2. What is the average cost efficiency of Islamic banks in Indonesia during 2012Q1-2015Q2?
3. What is the inter-temporal relationship between NPF and Islamic banks cost efficiency?

3.2 Modeling Non-Performing Finance Determinant and Cost Efficiency

3.2.1 Estimation of Determinants of Non-Performing Financing

The application software that used in analyzing the determinant factors of NPF is Eviews version 9. Eviews provides sophisticated data analysis, regression, and forecasting tools. Regression analysis that used in this research is panel data regression. Panel data regression method can provide more data that will produce the greater number of degree of freedom and overcome the problems occured when there is omitted-variable (Widarjono, 2007). Panel regression model has three alternative models for the estimation results. Those three models are (1) Common Constant Model (The Pooled OLS Method), (2) Fixed Effect Model (FEM), and Random Effect Model (REM). In order to find the right estimation model, Chow test and Hausman test are conducted. However, since the cross section data (N) in this research is lower than the number of independent variables, Hausman test cannot be used. Therefore, the method that will be tested is common constant model and fixed effect model.
In this study, external and internal factors will be used to find the significant variables that affect NPF of Islamic banks. The external factors is represented by GDP growth rate, inflation, and exchange rate. Whereas CAR, FDR, and OER depicts the internal factors. Panel regression of Non Performing Financing (NPF) determinants can be formulated as follows:

\[ Y_{it} = \alpha + \beta_1 X_{it,1} + \beta_2 X_{it,2} + \beta_3 X_{it,3} + \beta_4 X_{it,4} + \beta_5 X_{it,5} + \beta_6 X_{it,6} + \epsilon_{it} \]

In which:

\( Y = \) Non Performing Financing (NPF)
\( \alpha = \) constant
\( X_1 = \) GDP growth
\( X_2 = \) Inflation
\( X_3 = \) Exchange rate (growth)
\( X_4 = \) Capital Adequacy Ratio
\( X_5 = \) Financing to Deposit Ratio
\( X_6 = \) Operational Efficiency Ratio

\( \beta_1 = \) Determine the contribution of GDP growth (Coefficient regression of GDP growth)
\( \beta_2 = \) Determine the contribution of Inflation (Coefficient regression of Inflation)
\( \beta_3 = \) Determine the contribution of exchange rate (growth) (Coefficient regression of exchange rate (growth))
\( \beta_4 = \) Determine the contribution of CAR (Coefficient regression of CAR)
\( \beta_5 = \) Determine the contribution of FDR (Coefficient regression of FDR)
\( \beta_6 = \) Determine the contribution of OER (Coefficient regression of OER)
\( i = \) Total number of banks
\( t = \) Total number observations for each bank
\( \epsilon = \) Composite error term

The researchers performed t-test to see the effect of each independent variables to the dependent variable by comparing the value of significant t with significant standard \( \alpha = 0.05 \). The null hypotheses to be tested are:

\( H_{01} \): GDP has a negative and significant effect toward NPF
\( H_{02} \): Inflation has a positive and significant effect toward NPF
\( H_{03} \): Exchange Rate has a positive and significant effect toward NPF
\( H_{04} \): CAR has a negative and significant effect toward NPF
\( H_{05} \): FDR has a positive and significant effect toward NPF
\( H_{06} \): OER has a positive and significant effect toward NPF

Besides t-test, F-test is applied to test the simultaneous effect of independent variables to dependent variable. Before the hypothesis test, classical assumption testing is conducted through normality test, heteroscedasticity test, autocorrelation test, and multicollinearity test.
3.2.2 Estimation of Cost Efficiency

To measure the cost efficiency of Islamic banks, the researchers use the software of Maxdea version 6.6 to run DEA-CRS (Data Envelopment Analysis – Constant Return to Scale). DEA formulates the frontier of the observed input–output ratios by linear programming technique (Fare, Grosskopf, and Lovell, 1985). According to Charnes et al. (1978) as cited in Pasiouras et al. (2007), the input-oriented DEA model under the assumption of constant return to scale is calculated as:

\[ \text{Min}_{\theta, \lambda} \theta \]
\[ \text{s.t.} \quad -y_i + Y\lambda \geq 0 \]
\[ \theta x_i - X\lambda \geq 0 \]
\[ \lambda \geq 0 \]

Where \( \theta \leq 1 \) is the scalar efficient score and \( \lambda \) is \( N \times 1 \) vector of constants where \( N \) indicates the number of banks. If \( \theta = 1 \) the bank is considered to be efficient as it lies on the frontier, whereas if \( \theta < 1 \) the bank is determined to be inefficient and needs a reduction of \( 1 - \theta \) in the inputs levels to reach the frontier. The linear programming is being solved for \( N \) times, once for each bank sample, and a \( \theta \) value is acquired for each bank representing its technical efficiency score.

Then, in order to calculate allocative efficiency, \( w_i \) is assumed as \( N \times 1 \) vector of input prices for the \( i \)-th bank and solve the cost minimization model as follows:

\[ \text{Min}_{\lambda, x^*} w_i x^*_i \]
\[ \text{s.t.} \quad -y_i + Y\lambda \geq 0 \]
\[ x^*_i + X\lambda \geq 0 \]
\[ \lambda \geq 0 \]

Where \( x^*_i \) represents the cost-minimizing vector of input quantities for the \( i \)-th bank with the input prices \( w_i \) and the output levels \( y_i \). Therefore, the total cost efficiency of the \( i \)-th bank is calculated as follows:

\[ CE = \frac{w^*_i x^*_i}{w_i x_i} \]

The value of cost efficiency ranges from zero to one, where a value of one indicates full efficiency.

In this research, the input-output variables to calculate cost efficiency are adapted from Bader, Mohamad, Ariff, and Hassan (2008). The variables are consist of inputs, outputs, and price of inputs.
Table 2: Variables And Operational Definition Of Bank Cost Efficiency

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable Names</th>
<th>Operational Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X1</td>
<td>Labor</td>
<td>Total expenditures on employees (personal expenses)</td>
</tr>
<tr>
<td>X2</td>
<td>Fixed Assets</td>
<td>The sum of physical capital and premises</td>
</tr>
<tr>
<td>X3</td>
<td>Total Funds</td>
<td>Total funds that consist of giro wadhi’ah, mudharabah saving, and mudharabah deposit¹</td>
</tr>
<tr>
<td>Outputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y1</td>
<td>Total Financing</td>
<td>Total financing that consist of: murabahah, mudharabah, musyarakah, istishna, and qardhulhasan financing²</td>
</tr>
<tr>
<td>Y2</td>
<td>Other earning assets</td>
<td>Sum of Investment securities and interbank funds</td>
</tr>
<tr>
<td>Y3</td>
<td>Offbalance sheet items</td>
<td>The value of the off-balance sheet activities</td>
</tr>
<tr>
<td>Input Prices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI1</td>
<td>Price of Labor</td>
<td>Total personal expenses divided by the total fund</td>
</tr>
<tr>
<td>PI2</td>
<td>Price of Fixed Assets</td>
<td>Depreciation expenses divided by the fixed assets</td>
</tr>
<tr>
<td>PI3</td>
<td>Price of Funds</td>
<td>Interest expenses (profit sharing in Islamic bank) on deposits and other operating expenses divided by the total funds</td>
</tr>
</tbody>
</table>

3.2.3 Inter-temporal relationship between NPF and cost efficiency

Panel-VAR models is used to determining the inter-temporal relationship between NPF and banks’ cost efficiency. Vector Auto Regression (VAR) is generally used to forecast interrelated time series and analyze the dynamic impact of random disturbance on the variables system (Schwert, 2010).

The general mathematical representation of a VAR is:

\[ NPF_{it} = f_1(NPF_{it-1}, \ldots NPF_{it-n}; eff_{it-1}, \ldots eff_{it-n}) + e_{it} \]  \hspace{1cm} (1)

\[ eff_{it} = f_2(eff_{it-1}, \ldots eff_{it-n}; NPF_{it-1}, \ldots NPF_{it-n}) + e_{it} \]  \hspace{1cm} (2)

Where:

\[ e_{it} \] = a vector of innovations that may be contemporaneously correlated but are uncorrelated with their own own lagged values and uncorrelated with all of the right-hand side variables.

Equation number 1: NPF as dependent variable, cost efficiency as independent variable (Bad Management Hypothesis)

¹See Hidayat (2014)

1²See Hidayat (2014)
Equation number 2: Cost efficiency as dependent variable, NPF as independent variable (Bad Luck Hypothesis)

3.3 Data

This study used secondary data that consist of quarterly financial ratios of Islamic banks and macroeconomic indicators that published by Bank Indonesia and Central Agency of Statistics/Badan Pusat Statistik. Data collected through reviewing literature studies such as books, journals, papers, and several websites that have related information to the topic of this research as comprehensive theoretical foundation.

The population of this study is all Islamic banks that operate during 2012Q1 to 2015Q2, which consist of 12 Islamic commercial banks, 24 Islamic business units, and 161 Islamic rural banks. Sampling technique of this research is purposive sampling with the criteria are Islamic commercial banks which publish continuously their quarterly financial report with no out layered data during the research period. The other criteria is the banks that have credit risk problem or NPF ratio is more than the threshold that set by Bank Indonesia (5%) in the period 2012Q1 to 2015Q2. Based on those criteria, there are 5 Islamic banks selected as the research sample; Bank Syariah Mandiri (establish on 1 November 1999), Bank Muamalat Indonesia (establish on 1 November 1991, considered as the first Islamic Bank in Indonesia), Bank Jawa Barat dan Banten Syariah (establish on 20 May 2000), Bank Victoria Syariah (establish on 10 February 2010), and Bank Rakyat Indonesia Syariah (establish on 19 December 2008).

To determine the factors that affect NPF of Islamic banks in Indonesia, panel data regression method is applied. Cost Efficiency is measured by calculating efficiency score through an envelopment model function. The efficiency score then regressed against NPF to determine the temporal-relationship between NPF and banks cost efficiency through VAR model for time series.

4. Results and Discussion

To find the determinant factors of NPF, Fixed Effect Model is applied as the estimation model due to the result of the Chow test. The table below is the result of panel data regression result with FEM.
Table 3: Regression Model Result

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>-2.169944</td>
<td>0.213541</td>
<td>-10.16172</td>
<td>0.0000</td>
</tr>
<tr>
<td>INFLATION</td>
<td>-0.421087</td>
<td>0.085860</td>
<td>-4.904367</td>
<td>0.0000</td>
</tr>
<tr>
<td>EXCHANGE_RATE</td>
<td>0.111821</td>
<td>0.052780</td>
<td>2.118615</td>
<td>0.0383</td>
</tr>
<tr>
<td>CAR</td>
<td>-0.081732</td>
<td>0.030208</td>
<td>-2.705633</td>
<td>0.0089</td>
</tr>
<tr>
<td>FDR</td>
<td>-0.001746</td>
<td>0.016822</td>
<td>-0.103772</td>
<td>0.9177</td>
</tr>
<tr>
<td>OER</td>
<td>0.029767</td>
<td>0.011196</td>
<td>2.658791</td>
<td>0.0101</td>
</tr>
</tbody>
</table>

Dependent Variable: NPF  
Method: Panel Least Squares  
Date: 12/06/15   Time: 23:37  
Sample (adjusted): 3/01/2012 6/01/2015  
Periods included: 14  
Cross-sections included: 5  
Total panel (balanced) observations: 70  
White cross-section standard errors & covariance (d.f. corrected)

Cross-section fixed (dummy variables)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-squared</td>
<td>0.757708</td>
<td>Mean dependent var</td>
<td>4.095429</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.716642</td>
<td>S.D. dependent var</td>
<td>1.738266</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.925303</td>
<td>Akaike info criterion</td>
<td>2.825936</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>50.51492</td>
<td>Schwarz criterion</td>
<td>3.179271</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-87.90777</td>
<td>Hannan-Quinn criter.</td>
<td>2.966285</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>18.45082</td>
<td>Durbin-Watson stat</td>
<td>1.394294</td>
<td></td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Data processed by Author with Eviews9

The result shows the t-statistic of GDP is -10.162 with a significant level of 0.000. It indicates that GDP has a negative and significant effect on NPF. This finding is similar with the previous research conducted by Firmansyah (2014). The t-statistic of inflation is -4.904 with a significant level of 0.000. It indicates that inflation has a negative and significant effect on NPF. This finding is contradictory with the theory, where the increasing of inflation raises the ratio of NPF. Based on Firmansyah (2014), the reason behind this contradiction is because the behavioral of Indonesia people that tend to still pay back its obligation even though their purchasing power is decreasing. Exchange rate has the t-statistic 2.118 with the significant level of 0.038. It indicates that exchange rate has a positive and significant effect on NPF. This finding has a similar result with Mutamimah and Chasanah (2012). The t-statistic of CAR is -2.706 with the significant result of 0.008. It indicates that CAR has a positive and significant result on NPF. This finding is similar with Diyanti and Widyarti (2012). FDR has the t-statistic -0.104 with a significant result of 0.918. It indicates that FDR has no significant effect on NPF. The result is not in line with the hypothesis and theory. According to Alissanda (2015), this contradictory result is because FDR ratio more affects bank’s profitability as the opportunity to get profit sharing from the total financing given. The t-statistic of OER is 2.659 with the significant level of 0.010. It indicates that OER has a positive and significant effect on NPF. This finding consistent with the study by Alissanda (2015). The result of the the R² of the model is 0.758 and adjusted R² is 0.717. The result of
adjusted $R^2$ means 71.7% of dependent variable (NPF) is explained by the combination of variation of independent variables which are GDP growth rate, inflation, exchange rate, CAR, FDR, and OER. The rest of 28.3% is affected by other factors outside the research model.

4.1 Cost Efficiency Result

Based on Data Envelopment Analysis, Islamic banks is determined to be cost efficient if the efficiency score is equal to one. This research discusses the comparative efficiency score of every bank’s sample for every quarter and also the cost efficiency of the specific banks sample in their period. In order to get a comparative result, every bank is arranged consecutively for each quarter in the software before the program is running. This arrangement resulted to the comparative efficiency score with the benchmark of the most cost efficient bank in that quarter. The result of data processing indicates Bank Victoria Syariah (BVS) has better cost efficiency compared to another banks sample. This finding implies to the tightening cost that BVS conducted especially in the operational cost. The average total operational cost to total cost of BVS is the lowest compared to other banks’ sample. BVS only allocates approximately 86.7% of total cost for the operational. This lowest operational cost practice makes the bank has more cost efficiency than other banks’ sample. The another finding shows that the average Islamic banks’ cost efficiency period 2012Q1-2015Q2 is equal to 93.7%. It indicates that Islamic bank is inefficient in managing its cost and averagely used only 93.7% of input to achieve the maximum output. Thus, the improvement of cost efficiency is still needed to be emphasized.

4.2 Vector Auto Regression Model Result

To study the inter-temporal relationship between NPF and cost efficiency, the researchers use Vector Auto Regression with two, three, and four lags to prove and estimate whether “bad management” hypothesis or “bad luck hypothesis of Berger and De Young (1997) that can be applied in Islamic banks in Indonesia. The results are presented in table 4 and 5.

Table 4: Bad Management Hypothesis

<table>
<thead>
<tr>
<th>Defendent : NPF</th>
<th>Sum of Coefficient</th>
<th>Sum of Standart Error</th>
<th>Sum of t-ratio</th>
<th>R-Squared of NPF</th>
<th>F-statistic of NPF</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFF Lag 2</td>
<td>-0.2293</td>
<td>-4.3285</td>
<td>0.1324</td>
<td>0.6616</td>
<td>26.8854</td>
</tr>
<tr>
<td>EFF Lag 3</td>
<td>-6.4128</td>
<td>-7.1775</td>
<td>-2.6601</td>
<td>0.6830</td>
<td>17.2444</td>
</tr>
<tr>
<td>EFF Lag 4</td>
<td>-4.7349</td>
<td>-12.3354</td>
<td>-1.6379</td>
<td>0.7056</td>
<td>12.2886</td>
</tr>
</tbody>
</table>

Source: Data processed by Author with MaxDEA 6.6

Table 5: Bad Luck Hypothesis

<table>
<thead>
<tr>
<th>Defendent : EFF</th>
<th>Sum of Coefficient</th>
<th>Sum of Standart Error</th>
<th>Sum of t-ratio</th>
<th>R-Squared of EFF</th>
<th>F-statistic of EFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPF Lag 2</td>
<td>-0.0127</td>
<td>-0.0075</td>
<td>-0.1655</td>
<td>0.2215</td>
<td>3.9141</td>
</tr>
<tr>
<td>NPF Lag 3</td>
<td>-0.0018</td>
<td>-0.0256</td>
<td>-2.0571</td>
<td>0.3985</td>
<td>5.3015</td>
</tr>
<tr>
<td>NPF Lag 4</td>
<td>-0.0075</td>
<td>-0.0186</td>
<td>0.7310</td>
<td>0.4510</td>
<td>4.2117</td>
</tr>
</tbody>
</table>

Source: Data processed by Author with MaxDEA 6.6
Based on Berger and De Young (1997), the negative relationship indicates the increasing of NPF tend to be followed by the decreasing of banks efficiency, high levels of problem loans cause banks to increase spending on monitoring, working out, and/or selling of these loans. The results of this research reject “bad luck” hypothesis proposed by Berger and De Young (1997) since the estimated sum of the coefficient of NPF Lag 4 of Islamic banks is associated positively with efficiency. Whereas at table 4, the sum of the coefficient of cost efficiency is associated negatively with NPF. This finding indicates that a decrease in banks’ cost efficiency inflict to the increasing of NPF. This result supports the “bad management” hypothesis proposed by Berger and De Young (1997) which suggested that decrease in measured bank efficiency is generally followed by increases in NPF. The “bad management” hypothesis indicates that the major risks facing financial institution are caused by the internal problem.

5. Conclusion and Recommendations

The study examines the determinant variables of NPF: GDP growth rate, inflation, exchange rate, CAR, FDR, and OER. The result shows that GDP growth rate, inflation, exchange rate, CAR, and OER affect NPF of Islamic banks in Indonesia significantly. Meanwhile, FDR is not significant affect toward NPF. For external determinants, GDP growth rate has the highest coefficient among other external determinants. Meanwhile, CAR has the highest coefficient compared to other internal determinants. This result implies that Islamic banks should give more concerned to the GDP growth rate and manage its CAR in order to reduce the financing problem. Therefore, to reduce NPF problem, Islamic banks should have prudent and professional personnel in managing financing and pay more attention to the internal and external factors that have significantly positive or negative impact toward financing problem.

Bank Victoria Syariah is found having better cost efficient in this research period. The result also indicates Islamic banks in Indonesia are still inefficient in managing their cost. The finding also exhibits that Islamic banks in Indonesia period 2012Q1-2015Q2 supports ‘bad management’ hypothesis proposed by Berger and De Young (1997). ‘Bad management’ occurs when low efficiency is caused by poor internal management practices that inflict to the increasing of bad financing problem. Thus, financing problem is generally caused by management controllable factors that apply in day-to-day operations and management portfolio. Low-cost efficiency or cost inefficiency occurs before the increasing of NPF. There are several possibilities that management in the banks do not implement adequate financing underwriting, monitoring, and controlling. As ‘bad’ management, they may a) have poor skills in credit scoring and then choose a relatively high proportion of financing with low or negative net present values, b) be less than fully competent in appraising the collateral value.
pledged to the financing, and c) have difficulty monitoring and controlling the borrowers after financing is used to assure that covenants are followed. Therefore, Islamic banks should give more concerned in the cost management, for example by cutting unnecessary cost.

References


