Banks Efficiency and the Determinants of Non-Performing Financing of Full-Fledged Islamic Banks in Indonesia

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This paper investigates the efficiency of Indonesian Full-fledged Islamic Banks by employing Data Envelopment Analysis (DEA) approach; the determinants of non-performing financing (NPF) during the period 2012(Q1) to 2016(Q2) by using Panel Least Square for fixed effect model; the inter-temporal relationships between banks efficiency and NPF are run using VAR model to test the two hypotheses: „Bad Debt‟ and „Bad Management‟. This research uses quarterly published reports data of Central Bank of Indonesia (Bank Indonesia) and Financial Service Authority of Indonesia (Otoritas Jasa Keuangan Indonesia) with 4 Islamic banks as the sample of research. The overall results show that Exchange rate, Return on Asset Ratio (ROA), Financing to Deposit Ratio (FDR), Size have a negative and significant effect on NPF, while BI rate have a positive and significant effect on NPF. The finding of DEA indicates the mean score of Full-fledged Islamic banks in Indonesia is approach to efficient with the score 96.54% and Bank Rakyat Indonesia Syariah (BRIS) is the most technical efficient. The result shows that Full-fledged Islamic banks in Indonesia is not support the „bad management‟ and „Bad Luck‟ hypothesis, probably the averagely NPF of full-fledged is 4.5 % that is still bellow of the critical standard of Bank Indonesia.

Keyword: Non-performing Financing, Technical Efficiency, Panel Least Square, Data Envelopment Analysis, „Bad Luck‟, „Bad Management‟.

1. Introduction

The Indonesian economy, now entering a period of the tough times (Kalla, Jusuf 2016). In Bank of Indonesia statistics stated that economic growth in 2015 did not show good results. Indonesia's economic growth slowed, in the figure of 4.71% in the 1st quarter 2015 and 4.67% in the second quarter, below the target of 5.4% - 5.8% growth.

Bank is a financial institution whose operates to collect funds from the public in the form of deposits or saving and then channeled back to the people and provided other banking services. There are two types of banking itself, they are conventional banking and Islamic banking, Islamic banking is a bank that implemented Islamic law and each of the banking sector has their own trend in the market (Kashmir, 2008: 2). Under Article four (4) of Law No. 10 of 1998 which defines, banks in Indonesia acting to support the implementation of national development in order to enhance the equity, economic growth and domestic stability towards increasing the welfare of the people".

Islamic banking until today keeps on encountering a significant increase. It can be seen from the expanding number of Sharia bank office in Indonesia, which reached the level of 179% improvement from the total asset in 2010 (BI, 2015). However the high development is trailed by the increasing of the credit risk in the past four years as

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reflected by Non – Performing Financing (NPF) and this ratio getting closer to 5%, which is the maximum permitted from Bank Indonesia (BI) stated in full Regulation of Bank Indonesia No.

6/9/PBI/2004/2004, as depicts in the Table 1.1 bellow.

Table 1: NPF Ratio of Islamic Banks and Islamic Business Unit (Jan 2012 – June 2015)

	2012	2013	2014	2015	2016
Jan	2.68%	2.49%	3.01%	4.87%	5,46%
Feb	2.82%	2.72%	3.53%	5.10%	5,59%
Mar	2.76%	2.75%	3.22%	5,49 %	5,35%
Apr	2.85%	2.85%	3.49%	5,20 %	5,48%
May	2.93%	2.92%	4.02%	5,44%	6,17%
June	2.88%	2.64%	3.90%	5,09%	5,68%
July	2.92%	3.01%	4.30%	5,30%	
Augt	2.78%	2.80%	4.58%	5,30%	
Sep	2.74%	2.96%	4.67%	5,14%	
Oct	2.58%	2.62%	4.75%	5,16%	
Nov	2.50%	3.08%	4.86%	5,13%	
Des	2.22%	2.62%	4.33%	4,84%	

Source: Islamic Bank Statistics published by Bank of Indonesia

Non-Performing Financing (NPF) is also a financial ratio related to credit risk. Credit risk is the risk of potential misfortunes resulting from the non-settlement of bank loans back banks to borrowers and different counterparties (Ali, 2006: 27). Bank credit risk can be communicated by the number of bad loans or non-performing loans (NPL) in conventional banks and Non-Performing Financing (NPF) in Islamic banks. The higher the value of NPL or NPF of the banks, means implies the higher the credit risk of the bank. According to Ascarya and Yumanita (2009), the instability of a financial system described by the occurrence of three things and one of them was the failure of banking in which banks endured tremendous losses due to falling apart level of NPL.

Most banks in Indonesia still depend on credit as a noteworthy income to fund its operations. According to Siamat (2005), one of the reasons of the grouping of banking business in loaning is the way of business of banks as intermediary institutions between surplus spending units to the deficit spending units and the fundamental source of bank funding comes from the community so they ought to be directed back to the community in the form of credit.

The Islamic bank condition is still in the early improvement and has no incorporation rate yet to the worldwide finance system, so Islamic bank is out of the direct crisis. By the information, the determinant of the NPF can be more originates from the internal factor of the banks, but for making the overall result of this research, the researcher also gives the external factor to be the determinant of NPF. External influences incorporate macroeconomic factors that framed over monetary policy and fiscal policy at the macro level by the State Government (Auliani, 2016).

One critical part of performance estimation is the efficiency of the banking, among others (Sutawijaya and Lester, 2009: 51). So, besides NPF one of the essential parts of determining the performance of the banks is efficiency. Bank efficiency as measured

through overall technical efficiency (OTE), pure technical efficiency (PTE) and scale efficiency (SE) are important to be controlled and inspected as well as the risks in a particular condition of the economy. Measurement efficiency Banks in this study will use non-parametric Data Envelopment Analysis (DEA).

This study will assess the determinants of NPF from internal and external factors and the relationship of NPF and bank technical efficiency. Before its regression, the researchers measure bank efficiency through data envelopment analysis that ascertains the usage of inputs to produce multiple outputs. Bank efficiency and NPF are vital aspects of measuring banking performance. In several previous studies, Setiawan and Putri (2013) stated that the increase of non-performing financing of the Islamic banks in Indonesia is mainly caused by poor management rather than external factors. The bank-specific variables/internal variables that have more effect to NPF of Islamic banks in Indonesia compared to external variables may also be explained due to the small market share of Islamic banks' assets in Indonesia, just around 3% compared to conventional banks' total assets. Havidz and Setiawan (2015) stated that regarding the determinants of NPF, there are significant effects of size, operational efficiency ratio (OER), and GDP growth rate toward NPF, while return on assets (ROA), financing to deposit ratio (FDR), capital adequacy ratio (CAR), and inflation rate (INF) have insignificant effect on NPF. On the other hand, the study of Kurniawan (2014) defined that CAR, BI Rate, and OER partially no significant effect on the level of credit risk (NPL), LDR has partially significant effect on the degree of credit risk (NPL) while the ROA has a partial significant negative impact on the level of credit risk (NPL).

This study focus to determine the significant variables that affect the non-performing financing of full-fledged Islamic Banks in Indonesia and to examine the technical efficiency of Full-fledged Islamic Banks in Indonesia by using Islamic Bank's inputs-outputs. This research additionally aimed to determine the inter-temporal relationships between non-performing financing and technical efficiency of full-fledged Islamic Banks in Indonesia.

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

2. Literature Review

The researchers reviewed the previous research related to non-performing loans (NPL) in conventional banks and non-performing financing (NPF) in Islamic banks and efficiency of the banking system in full-fledged Islamic banking to arrive at the theoretical framework of this research.

2.1 Non-Performing Financing Determinants

Factors that effect NPF can be arrived from internal and external factors. In order to find the causes, external factors used in this research are BI rate and exchange rate. Internal factors considered are Financing to Deposit Ratio (FDR), Bank Size and Return on Asset Ratio (ROA). Several studies which investigate the NPF determinants are Fajriati (2016), Anin Diyanti (2012), M. Sabir (2012), Kurniawan (2014), Mares Suci (2013), Febrianti (2014), Wikutama (2010).

Anin Diyanti (2012) and Indah Fajriati (2015) found that FDR has a positive and significant impact on NPF. FDR is a ratio that measures a bank's capacity to meet financial commitments that must fill, therefore, when FDR growth rate increases, gives an indication of the small capacity of the relevant bank liquidity and, therefore, the NPF ratio increases.

M. Sabir (2012) and Kurniawan (2014) found that ROA has a negative and significant effect on NPL ratio. The greater the ROA of a bank, the higher the rate of profit achieved by the bank, the better the position of the bank concerning asset utilization. The profits obtained can be used to cover non-performing loans (NPL) incurred (Pramudita, 2013).

According to Mares Suci (2013), Bank Size has a significant and negative effect on NPF. The greater the assets owned by the bank can enhance the volume of financing that can be distributed by the bank, which means that more of the total funding provided. The greater the total funding will lead to the smaller of NPF ratio is generated.

According to Febrianti (2014) found that BI rate has a positive and significant impact on NPF. BI Rate as a policy that reflects the attitude or stance of the monetary policy set by Bank Indonesia and announced to the public. BI Rate in Islamic banking acts as a comparison. Debtors will tend to seek lower interest when making a loan, the current interest rate of conventional bank loans raised due to the increase in the BI rate; the debtors will choose other options that make loans or financing in Islamic banks. In such conditions, the amount of financing provided Islamic banks have increased so that the financing risks faced by Islamic banks also increased.

Based on Wikutama (2010) explains that the depreciation of the home currency has an impact on lending in foreign currency due to the rising borrowing relative value in agreement with the decline of the home currency. Increasing the number of liabilities will result in a decrease in the ability of borrowers to complete the loan, and in many cases led to increasing NPL.

2.2 Bank Efficiency

M. D. Huri and Indah Susilowati (2004) explains that efficiency can be explained as the ratio between the output (output) to the input (input), or the amount of output generated from one input used. Shakir Ahmad Kurnia (2004) explains that the overall banking efficiency can be decomposed inefficiencies of scale (scale efficiency), the efficiency of coverage (scope efficiency), technical efficiency (technical efficiency), and the efficiency of the allocation (allocative efficiency).

Nurul Komaryatin (2006) mentioned there are two terms of efficiency, the technical and economic efficiency. Economic efficiency has a macro point of view that has more reach than technical efficiency micro-view angle. Measurement of technical efficiency tends to be limited to technical and operational relationships in the process of converting inputs into outputs. As a result, the efforts to improve the technical efficiency required a micro policy that is internal, which is the control and optimal resource allocation. Price in economic efficiency cannot consider given because prices influence by macro policy.

Efficiency measurement of Islamic banks in this study will use non-parametric Data Envelopment Analysis (DEA). This method has the advantage of being able to deal with cases of input diverse, as factors that are beyond the control of management and facilitate comparisons of efficiency by using the same criteria. Through the usage of the simple form, ratio is used to determine the efficiency of each organization, including banking institutions (Putri and Lukviarman, 2008: 40).

Some of previous study has been done of analyze about the technical efficiency, the study conducted by Endri (2011) also use DEA for analyze the Performance of Technical Efficiency

of Regional Development Banks. In addition Slamet Awaludin (2012) do the research about Islamic Banking efficiency analysis approach with data envelopment analysis. Moreover, the research of Wahab, Hosen & Syafaat Muhari (2014) analyze the comparison between Technical Conventional Commercial Bank and Islamic commercial Banks technical efficiency in Indonesia is used Data Envelopment Analysis also.

Several hypotheses related to the NPF and efficiency, they are "bad management" and "bad luck." The " bad management theory related to the poor management in the banking industry that can be caused the results of poor quality loans, and therefore, escalates the level of nonperforming loans. On the other hand, in "bad luck" hypothesis the increasing of non-performing loans is caused by an unexpected exogenous event or bad luck, such as the economic slowdown (Berger and De Young, 1997). Past studies of Setiawan and Putri (2013) stated that the increase of non-performing financing of the Islamic banks in Indonesia mainly causes of poor management rather than external factors. In addition, the result of the study conducted by Setiawan and Bhirawa (2016) also has the result that in line with Setiawan and Putri (2013) result. In this study, the researcher will discover whether "bad luck" hypothesis or "bad management" hypothesis applied to Full-Fledged Islamic Banks in Indonesia.

3. Methodology

3.1 Research Questions

1.   What factors both internal and external that provides significant effect and how those factors affect the Non-Performing Financing (NPF) of Full-fledged Islamic Banking in Indonesia?
2.   What is the most efficient Full-fledged Islamic Bank in Indonesia from January 2012 until June 2016?
3.   What is the inter-temporal relationship between NPF and Full-fledged Islamic bank technical efficiency?

3.2 Modeling Non-Performing Finance Determinant and Cost Efficiency

3.2.1 Estimation of Determinants of Non-Performing Financing

The application software utilized for analyzing the determinant variables of NPF is Eviews version 9. Eviews gives complex information data analysis, regression, and forecasting equipment. Regression analysis utilized as a part of this study is panel data regression. Data regression method can give more information that will create the most prominent level of flexibility and can conquer the issues occurred when there is precluded variables (Widarjono, 2007).

The application software used in analyzing the determinant factors of NPF is Eviews version 9. Eviews provides sophisticated data analysis, regression, and forecasting tools. Regression analysis used in this research is panel data regression. Panel data regression method can provide more data that will produce the greater degree of freedom and can overcome the problems occurred when there is omitted-variable (Widarjono, 2007). Panel regression model has three option models for the estimation outcomes. 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 suitable estimation model, Chow test and Hausman test are conducted. However, since the cross section data (N) in this study is lower than the number of independent variables, Hausman test cannot be used. Therefore, the method that will be examined is Common Constant model and Fixed Effect model**.**

In this research, external and internal factors will be used to find the significant variables that affect NPF of full-fledged Islamic banks. The external factors are represented by BI rate and

exchange rate. On the other hand, FDR, ROA and Bank Size explain the internal factors. Panel regression of Non Performing Financing (NPF) determinants can be formulated as follows:

$Y_{it} = \alpha_i + \beta_1 X_{it,1} + \beta_2 X_{it,2} + \beta_3 X_{it,3} + \beta_4 X_{it,4} + \beta_5 X_{it,5} + \varepsilon_{it}$ In which:
Y = Non Performing Financing (NPF) α = constant
X1 = BI rate
X2 = Exchange rate (growth)
X3 = Financing to Deposit Ratio (FDR)
X4 = Return on Asset Ratio   X5 = Bank Size β1 = Determines the contribution of BI rate (Coefficient regression of BI rate) β2 = Determines the contribution of exchange rate (growth) (Coefficient regression of exchange rate (growth)) β3 = Determines the contribution of FDR (Coefficient regression of FDR) β4 = Determines the contribution of ROA (Coefficient regression of ROA) β5 = Determines the contribution of Banks Size (Coefficient regression of Bank Size) t = Total number observations for each bank ε = Composite error term
The researchers performed t-test to see the effect of each independent variable on the dependent variable by comparing the value of significant t with significant standard α = 0.05. The hypotheses to be tested are:

$H0_1$: There is no significant effect of FDR to the NPF in Full - Fledged Islamic Banks.

Ha_1 : There is significant effect of FDR to the NPF in Full-Fledged Islamic Banks.

$H0_2$: There is no significant effect of ROA to the NPF in Full-Fledged Islamic Banks

Ha_2 : There is significant effect of ROA to the NPF in Full-Fledged Islamic Banks

$H0_3$: There is no significant effect of SIZE to the NPF in Full-Fledged Islamic Banks.

Ha_3 : There is significant effect of SIZE to the NPF in Full-Fledged Islamic Banks.

$H0_4$: There is no significant effect of BI rate to the NPF in Full-Fledged Islamic Banks.

Ha_4 : There is significant effect of BI rate to the NPF in Full-Fledged Islamic Banks.

$H0_5$: There is no significant effect of Exchange rate to the NPF in Full-Fledged Islamic Banks.

Ha_5 : There is significant effect of Exchange rate to the NPF in Full-Fledged Islamic Banks.

In addition, F-test is applied to test the simultaneous effect of independent variables on the 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 Technical Efficiency

Bank efficiency as measured through overall technical efficiency (OTE), pure technical efficiency (PTE) and scale efficiency (SE) are important to be controlled and inspected as well as the risks in a particular condition of the economy. Measuring the effectiveness of the bank can be done by some of the methods such as the comparison of the performance indicators of the banking and financial ratios, there are likewise some different technique, the parametric and non-parametric approach (Hadad et al., 2003: 2). The parametric approach incorporates the Stochastic Frontier Approach (SFA), Distribution-Free Approach (DFA), and Thick Frontier Approach (TFA), while the non-parametric approach is to utilize Data Envelopment Analysis (DEA).

In examining the data of efficiency, researchers utilize an application that is DEA – CRS (Data Envelopment Analysis – Constant Return to Scale) output oriented to know the efficiency score. Data Envelopment Analysis (DEA) is a moderately new " data oriented " approach for

assessing the evaluating the performance an arrangement of associated substances called Decision Making Units (DMUs) which change over many inputs to the different output. DEA utilizes mathematical programming to verifiably appraise the tradeoffs inalienable in the effective experimental frontier (Zhu, 2010:4). In specific, to measure the technical efficiency of Islamic banks, the researchers use the software of Maxdea version 6.13 to run DEACRS (Data Envelopment Analysis – Constant Return to Scale).

In this study, the variables used to calculate technical efficiency are adapted from Endri (2011), Slamet Awaludin (2012) and Abdul Wahab, Muhamad Nadratuzzaman Hosen & Syafaat Muhari (2014). The variables consist of three kinds of variables to calculate technical efficiency.

Table 2: Variables and Operational Definition of Bank Technical Efficiency

Variables	Operational Definition	Scale	Source
Inputs			
Total Funds	Giro Wadhi'ah, mudharabah saving, and mudharabah deposito	Nominal	Muhamad Nadratuzzaman Hosen & Syafaat Muhari (2014)
Labor	Total expenditures on employees (Personal Expense)	Nominal	Slamet Awaludin (2012)
Fixed Asset	The sum of Physical capital and premises	Nominal	Muhamad Nadratuzzaman Hosen & Syafaat Muhari (2014)
Outputs			
Total Financing	Total of financing consist of: murabahah, mudharabah, musyarakah, istishna, and qardhul hasan financing	Nominal	Endri (2011) and Slamet Awaludin (2012)
Total Operational Definition	Total of the operational income of the banks	Nominal	Endri (2011)

3.2.1 Inter-temporal Relationship between NPF and Cost Efficiency

To determine the inter-temporal relationships between non-performing financing (NPF) and bank efficiency of Full-fledged Islamic banks in Indonesia, the researchers utilize Vector Auto Regression (VARs) model for time series in Eviews version 9. As indicated by Schwert User's Guide II (2010), the Vector Auto Regression (VAR) is utilized for determining frameworks of interrelated time series and for dissecting the dynamic effect of random unsettling influence on the system of variables. VAR approach treats every endogenous (independent) variable in the system as a function of the lagged values. This approach has been used by recent studies such as Havidz and Setiawan (2015) and Setiawan and Bhirawa (2016).

The general mathematical representation of a VAR is:

$$NPF_{I,t} = f_1\left(NPF_{i,t-1} \dots NPF_{i,t-n}; eff_{i,t-1} \dots eff_{i,t-n}\right) + e_{it} \qquad (1)$$

$$eff_{I,t} = f_2\big(eff_{i,t-1} \ldots eff_{i,t-n}; NPF_{i,t-1} \ldots NPF_{i,t-n}\big) + e_{it}$$ ………………….... (2)

Where:

e_{it} = a vector of innovations that may be contemporaneously correlated but are uncorrelated with their 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)

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

3.3 Data

This study utilizes secondary data that comprised of quarterly financial ratios of Fullfledged Islamic Banks in Indonesia and macroeconomic indicators that have been published by Bank Indonesia and Central Agency of Statistics / Badan Pusat Statistik. The population of this study is all Islamic banks that operate during 2012Q1 to 2016Q2, which consist of 13 Fullfledged Islamic banks, 24 Islamic business units, and 161 Islamic rural banks.

Sampling technique conveyed in this research is purposive sampling. The first selection determination foundation was the continuous data series example Full-fledged Islamic banks, which publish their quarterly financial report continuously with no out layered data amid the research period. The second selection determination foundation was the banks that have a credit risk problem, or NPF ratio is greater than the threshold set by Bank Indonesia (5%) amid the period 2012Q1 to 2016Q2. In accordance with these criteria, there are 4 Full-fledged Islamic banks selected as the research sample, which are Bank Rakyat Indonesia Syariah, Bank Syariah Mandiri, Bank Muamalat Indonesia, and Bank Victoria Syariah.

To determine the factors that affect NPF of Islamic banks in Indonesia and to know the model of the data, panel data regression method is applied. Descriptive analysis statistic also used for describing the data by looking at the mean, median, standard deviation, maximum, and minimum. The classic assumption test applied in this research are normality, autocorrelation, multicollinearity, and heteroscedasticity testing. There is two testing methods can be implemented to test the hypothesis which is T-test and F-test. Technical Efficiency is determined by calculating efficiency score through an envelopment model formula. The efficiency score was then regressed against NPF to define the inter-temporal relationships between NPF and bank"s technical 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. This research use lagged independent variables. The lagged independent variable strategy is attractive because it indicates to ease the threats to causal identification with-out requiring any other data than that available in the dataset. This approach, in any case, is grounded in a pre-Credibility Revolution understanding of the issue of endogeneity (cf. Angrist and Pischke 2009). The table below is the result of panel data regression using FEM.

Table 3: Regression Model Result

Dependent Variable: NPF
Method: Panel Least Squares
Date: 11/29/16   Time: 14:31
Sample (adjusted): 6/01/2012 6/01/2016
Periods included: 17
Cross-sections included: 4
Total panel (balanced) observations: 68
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDR(-1)	-1.263741	0.405732	-3.114722	0.0028
ROA(-1)	-1.278600	0.246858	-5.179490	0.0000
SIZE(-1)	-0.401743	0.214238	-1.875215	0.0657
EXCHANGE_RATE(-1)	-0.095083	0.052869	-1.798454	0.0772
BI_RATE	0.629088	0.214905	2.927280	0.0049
C	4.515582	1.972021	2.289824	0.0256

Effects Specification				

Cross-section fixed (dummy variables)

R-squared	0.715502	Mean dependent var	4.586765
Adjusted R-squared	0.676926	S.D. dependent var	2.156302
S.E. of regression	1.225632	Akaike info criterion	3.367527
Sum squared resid	88.62830	Schwarz criterion	3.661285
Log likelihood	-105.4959	Hannan-Quinn criter.	3.483923
F-statistic	18.54789	Durbin-Watson stat	1.687834
Prob(F-statistic)	0.000000		

Source: Data processed by Author with Eviews9

The result shows the t-statistic of FDR growth is -3.114 with a significance of 0.0028. It indicates that FDR has a negative and significant effect on NPF. The result is not in line with the hypothesis and theory. As indicated by Alissanda (2015), this opposing outcome is due to FDR ratio affects bank"s profitability as the opportunity arises to get profit sharing from the total financing, so the profit will be used to cover the NPF. The t-statistic of ROA is 5.179 with a significance level of 0.000. It indicates that inflation has a negative and significant effect on NPF. This finding is in line with the previous research conducted M. Sabir (2011). Bank Size has the t-statistic is -1.875 with a significant of 0.0657. It indicates that exchange rate has a negative and significant effect on NPF. This finding agree with Anin Diyanti (2012) and Mares Suci (2013) research result. The t- statistic of Exchange rate is -1.798 with a significant of 0.0772. It indicates that Exchange rate has a negative and significant impact on NPF. This finding is similar with Indah Fajriati (2016). The t-test statistic of BI rate is 2.927 with a significant of 0.0049. It indicates that BI rate has a negative and significant impact on NPF. This finding is consistent with Febrianti (2015). The result of the R^2 of the model is 0.715502 and adjusted R^2 0.676926. The result of adjusted R^2 defines that 67.70% of NPF (dependent variable) is explained by the combination of independent variables which are FDR, ROA, SIZE,

Exchange rate, and BI rate. The rest of the 32.30% are influenced by other factors outside the research model.

4.1 Cost Efficiency Result

Based on Data Envelopment Analysis, full-fledged Islamic banks can be technical efficient if the efficiency score is equal to one. Based on Mansyur (2012), Banks with an efficiency value close to 0, the more inefficient the bank. Meanwhile, banks with efficiency values close to 1, the more efficient the bank. This study examines the comparative efficiency score of every bank‟s sample for every quarter and also the technical efficiency of the specific banks‟ sample during the period. With a specific end goal to get a comparative result, each bank is arranged successively for every quarter in the software before the program is running. This course of action came about to the relative efficiency score with the benchmark of the most efficient bank in that quarter. Bank Rakyat Indonesia Syariah is has better technical efficient than others bank‟s sample period 2012Q1-2015Q2.

This finding indicates the tightening of technical efficiency that BRIS ensured especially the total financing and operational income. Most of the issues lies in total financing and total operational income. But the finding shows BRIS needs to diminish and deal with employee operational and total fixed asset. In addition, the average of NPF of BRIS is the smallest compare others. The another finding shows that the average Islamic banks‟ cost efficiency during the period 2012Q1-2016Q2 is equal to 96,54%. It showed that Full-fledged Islamic banks are still not fully efficient in managing its technical and meanly used only 96.54% of inputs to achieve optimum outputs. This is because the way to manage the financing is still not optimal. Thus, the improvement of cost efficiency is still needed to be emphasized.

4.2 Vector Auto Regression Model Result

In order to discover the relationship among NPF and technical efficiency, the researcher will utilize Vector Auto Regression with two, three, four *lag*. The outcome is exhibited in table 4.12 and 4.13 (the VAR model result can be found in the appendix). Since the effect of the independent variable all in all (with all *lag*) is of principle interest, the sum of the coefficients are critical (Berger and DeYoung, 1997, pp. 856–857). The program to process VAR model is Eviews version 9.

Table 4 Bad Management Hypothesis

	Sum of Coefficient	Sum of Standard Error	Sum of tratio	R-Squared of NPF	F-statistic of NPF
Dependent: NPF					
EFF LAG 2	2,82651	-5,43595	0,00000	0.588411	23,23112
EFF LAG 3	2,52524	-8,64992	0,82457	0.587597	14,72305
EFF LAG 4	2,42265	-11,851680	0,7872	0.608710	11,4729

Source: Data processed by Author with MaxDEA 6.13 program

Table 5 Bad Luck Hypothesis

Dependent: EFF					
	Sum of Coefficient	**Sum of Standard Error**	**Sum of tratio**	**R-Squared of EFF**	**F-statistic of EFF**
NPF LAG 2	-0,000356	-0,01152	0	0.139626	2,63714
NPF LAG 3	0,001229	-0,01907	-0,26584	0.183734	2,325933
NPF LAG 4	0,001091	-0,02745	-0,39731	0.185754	1,682457

Source: Data processed by Author with MaxDEA 6.13 program

The positive relationship in table 4 demonstrates the increasing of NPF have a tendency to be trailed by the increasing of bank"s efficiency, higher amounts of credit issue make banks cause banks to increase spending in monitoring working out, and/or selling these financing. The results of this research reject "bad management" hypothesis proposed by Berger and De Young (1997) since the estimated sum of coefficient of NPF lag 4 of full-fledged Islamic banks is associated positively with efficiency.

In addition, at table 5, the outcome shows that the sum of the technical efficiency coefficient is related negatively with Non-Performing Financing. This result rejects the "bad luck" hypothesis which proposed that the decline in measured bank effectiveness is commonly followed by decline non-performing financing.

None of them support bad luck or bad management, since averagely all the banks consider approach to efficient with the mean score 96.54. In addition, the average of NPF is still below the standard which is averagely 4,587. That number of Non-performing financing still below 5% as the Non-performing financing standard from Bank of Indonesia regulation No. 6/9/PBI/2004/2004. Therefore, the outcome of this study shows that Full-fledged Islamic banks in Indonesia are not support both of the hypothesis which are "bad management" and "Bad Luck" hypotheses. There is no confirmation on a reverse relationship and no significant support for the alternate hypothesis either.

5. Conclusion

This study tried to examine the impact of the determinant variables on NPF. NonPerforming Financing is affected by internal and external factors both partially and simultaneously. The internal and external variables are FDR, ROA, SIZE, and Exchange rate that has a negative effect towards Non-performing financing. Meanwhile, BI rate has a positive effect toward Non-performing.

The average of Full-fledged Islamic banks technical efficiency period 2012Q1 – 2016Q2 is equal to 96,54%. It showed that Full-fledged Islamic banks are still not fully efficient in managing its technical and meanly used only 96.54% of inputs to achieve optimum outputs. This is because the way to manage the financing is still not optimal. In this research the most efficient bank in period 2012Q2 – 2016Q2 is Bank Rakyat Indonesia Syariah compared with the other banks, which averagely used 98.40% of inputs to achieve the maximum outputs.

From the result of the inter-temporal relationships between NPF and Technical Efficiency, it defines that Full-fledged Islamic banks in Indonesia period 2012Q1 – 2016Q2 not support

„Bad luck" and „Bad Management" Hypotheses. Probably because of averagely the percentage of NPF is bellow the critical standard which is 5% and the score of efficiency is approach to fully efficient.

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