

# PERFORMANCE ANALYSIS: THE INFLUENCE OF SIZE AND RISK ON PROFITABILITY OF STATE AND PRIVATE ISLAMIC BANKS IN INDONESIA

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**Abstract:** *Research on the factors that affect the profitability of conventional banks have been made. On the other hand research on Islamic banks is still relatively small, especially for Islamic banking in Indonesia. This study analyzes the factors that affect the profitability of Islamic banks in Indonesia partially and simultaneously. The results indicate that Total Asset, Non Performing Asset, Non Performing Financing, and Operating Cost and Operating Revenue have a negative and significant effect on the profitability of Islamic banks in Indonesia, as measured by Return On Asset and Return On Equity. The influence of total assets on the level of profitability shows that on the average profitability of Islamic banks's still relatively not efficient although the age of the Islamic banking industry in Indonesia has existed for more than one decade.*

**Keywords:** *Islamic Bank, Size, Risk, Profitability*

## 1. INTRODUCTION

Islamic economic system has fundamental differences with the Economic system of capitalism and socialism (Ahmad, 2007). According to Khan (IMF, 2010) Islamic economics is a complete system which establishes a specific pattern on the social and economic behavior for all individuals. In modern literature, the term is generally understood that economics as a science studies & examines how individuals or groups make choices. Choices must be made when humans fulfil their needs. This is because every human being has limitations or scarcity of their resources, so that he/she should make choices to allocate their resources.

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In the view of Islam, economics is the science which deals with efforts to maintain and improve the productivition of goods and services. Because wealth exists naturally as well as by efforts to maintain and improve productivity universal, then the discussion about economics is a universal discussion which also in accordance with the development of science and technology. Therefore, as economics is not influenced by the worldview or ideology and certainly is universal, then it can be taken from anywhere useful (Ayub, 2007).

While the "economic system" describes how to obtain, how to use and how to distribute the wealth that has owned it or in other words to explain about the ownership of wealth, how to utilize and develop the wealth, as well as how to distribute wealth to the society (Chapra, 2009). Therefore, economic system in view of the Islamic ideology is different from the economic system in view of capitalist, socialism, and communism ideology.

It has been quarter of a century since the first Islamic bank was established. During this period, the Islamic banking industry has witnessed a gradual and sustained expansion. In this respect, two distinct approaches have been followed. Firstly, Islamic banks and financial institutions were established in several parts of the world, including some non muslim countries, on private initiatives. The number of such banks and financial institutions is now more than one hundred. Secondly, attempts were initiated to convert the whole financial system to Islamic principles in some Muslim countries (Ayub, 2007).

During the last two decades, Islamic banks succeeded in formulating many creative and flexible profit-sharing instruments that enabled them to compete with their counterparts. Nonetheless, in trying to maximize the value of shareholders investment, Islamic financial institutions are exposed to risks. Hence, analyzing the performance of Islamic banks is important from economic and public policy perspectives (Bashir, 1999).

In Indonesia, Bank Muamalat Indonesia (BMI) which was established in 1992 can be called as the pioneer of Islamic financial institutions. Although BMI is the pioneer of Islamic financial institution in Indonesia, actually relatively late compared with the growth of Islamic banks in other countries. For example Islamic Rural Bank in Mit Ghamr village, Kairo, Egypt has been established in 1963. Next Islamic Dvelopment Bank (IDB) has been established in 1975, Dubai Islamic Bank (1975), Kuwait Finance House (1977), Islamic Faisal Bank in Egypt and Sudan (1978), Jordan Islamic Bank for Finance and Investment, and Bahrain Islamic Bank (Wilson, 1977). After that

many Islamic banks has been established in Sudan, Pakistan, Iran, Malaysia, Bangladesh, and Turkey (Wilson, 1977).

Based on National Act #10 year 1998 which explicitly mentions the existence of Islamic banks as one of the banks that can established in Indonesia, the growth of Islamic Bank are high (Table 1.1).

**Table 1.**  
**Islamic Banks Office (unit)**

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Islamic Commercial Banks	3	3	3	5	6	11	11	11	11	12
Total Office	304	349	401	581	711	1215	1401	1745	1998	2151
Islamic Business Unit	19	20	26	27	25	23	24	24	23	22
Total Office	154	183	196	241	287	272	336	517	590	320
Islamic Rural Banks	92	105	114	131	138	150	155	158	163	163
Total Office	92	105	185	202	225	286	362	401	402	439

**Source:** Bank Indonesia, 2014

**Table 2.**  
**Number of Workers in Islamic Banking**

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Islamic Commercial Banks	3523	3913	4331	6609	10348	15224	21820	24111	26717	41393
Islamic Business Unit	1436	1797	2266	2562	2296	1868	2068	3108	11511	4425
Islamic Rural Banks	1037	1666	2108	2581	2799	3172	3773	4359	4826	4704

**Source:** Bank Indonesia, 2014

Based on the table we can see that the number of total office and worker in Islamic commercial banks, Islamic business unit, and Islamic rural banks are increasing during 10 years from 2005-2014.

The increasing number of office will affect Islamic banking total assets. The total asset (Islamic Commercial Banks and Islamic Business Unit) increase (see Table 1.3).

**Table 3.**  
**Islamic Commercial Banks and Islamic Business Unit Total Asset\***

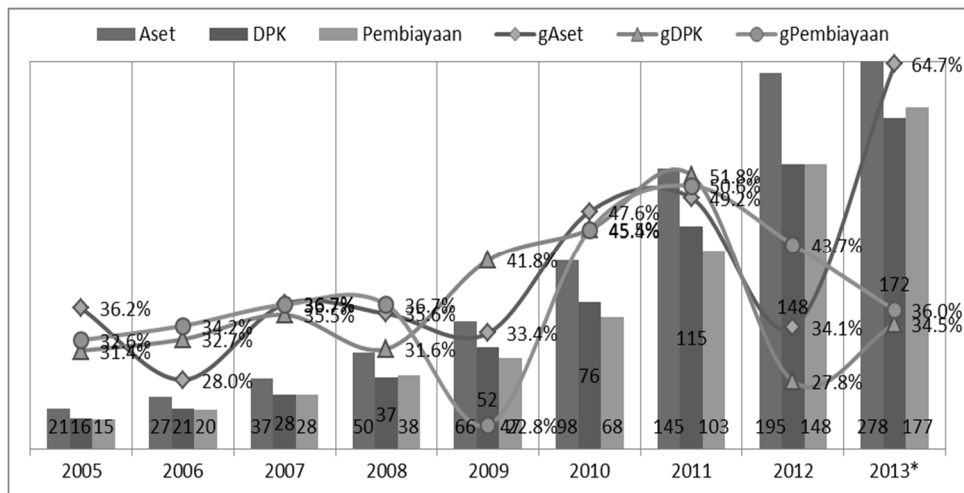
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Assets	20,880	26,722	36,538	49,555	66,090	97,519	145,467	195,018	242,276	272,343

\*In Million IDR

Source: Bank Indonesia, 2014

Islamic bank or sharia bank is a financial institution (bank) which operate without interest, unlike conventional bank. Islamic bank operation is based on profit loss sharing, dictated by the rule of islam, al-qur'an and al hadits. some of convetional banks activities are prohibited by islamic sharia, such as transaction with interest (riba), and give funds to production activities and trade which is forbidden like alcohol, beer, etc (khamr) (Ahmad, 2007). The growth of asset, funding and financing from Islamic banks in Indonesia during nine years can be described as follow :

**Figure 1. The Growth of Asset-Funding and Financing of Islamic Banks**

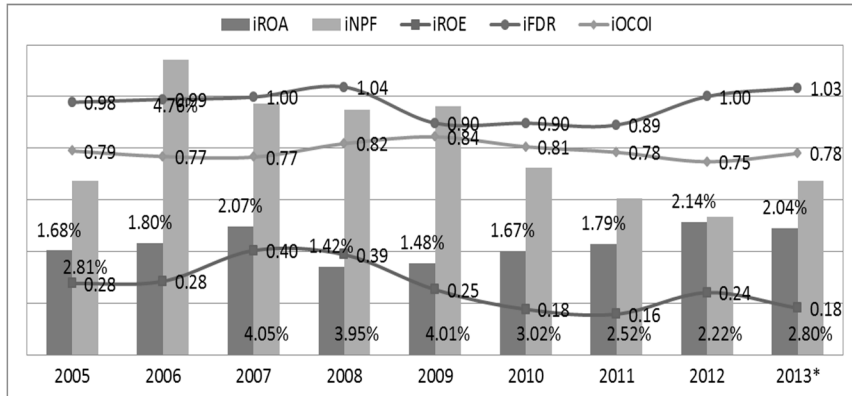


Source: Bank Indonesia, 2014

Islamic banks (commercial banks and rural banks) from the side of the scale is still far less than the conventional banks. Nevertheless, the performance of Islamic banks is better than conventional banks it can be seen from Islamic Banks Performance. Bank Performance is the measurement of

the performance of a bank or a financial institution in achieving its objectives both in terms of owners, employees, debtors, creditors, and consumers. The success of a financial institution is often associated with the analysis of financial statements, the determination of the success is based on three financial ratios that can be used as a benchmark for determining the level of efficiency and effectiveness (Figure 2).

Figure 2. Performance of Islamic Banks



Source: Bank Indonesia, 2014

i ROA = Islamic Return On Assets

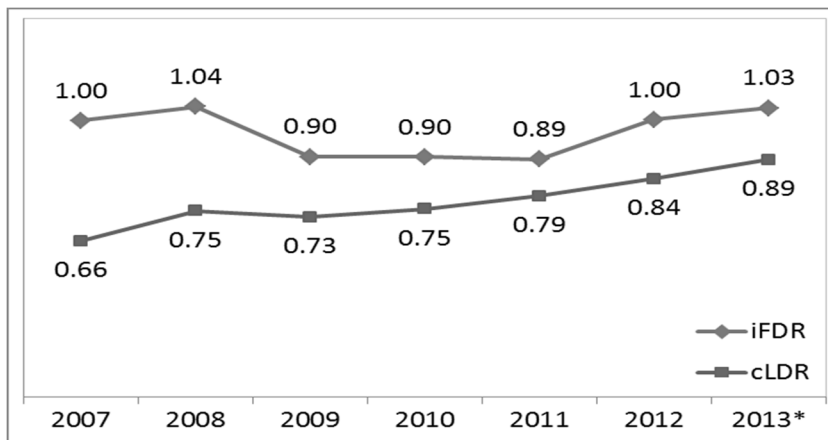
i NPF = Islamic Non Performing Financing

i ROE = Islamic Return On Equity

i FDR = Islamic Financing Deposit Ratio

i OCOI = Islamic Operational Cost and Operational Income Ratio

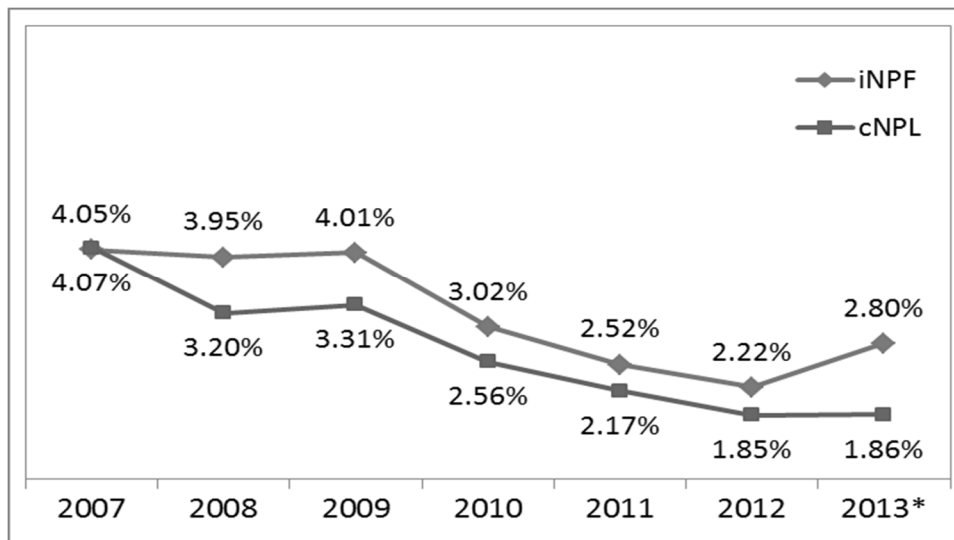
Figure 3. Risk of Islamic and Convetional Banks (FDR/LDR)



Source: Bank Indonesia, 2014

The Loan Deposit Ratio (in conventional banks) or Financing Deposit Ratio (in Islamic banks) during seven years indicate that Islamic banks is better than conventional banks, this mean that Islamic banks more active in lending than conventional banks.

Figure 4. Risk of Islamic and Conventional Banks (NPF/NPL)



Source: Bank Indonesia, 2014

The ratio of Net Performing Loan (in conventional banks) or Net Performing Finance (in Islamic banks) during seven years indicate that Islamic banks more risky than conventional banks where it shows more credits uncollected.

Many of the challenges and problem are faced in the development of Islamic banking, especially in Indonesia. The problems that arise is the lack of public knowledge on Islamic banking primarily due to the dominance of conventional banking. Here are a few obstacles that arise because of the development of Islamic banking (Antonio, 2001).

1. Banking operations regulation have not fully accommodate Islamic banks.
2. Network offices Islamic banks have not been widespread.
3. Limited human resources with expertise in Islamic banks.

This reseach will analyzes the performance of state and private Islamic banks in Indonesia. State Bank is a financial institution that has been

chartered by a state to provide commercial banking. A state bank is not the same as a central or reserve bank because of bank is primarily concerned with influencing government monetary policy. State banks have historically played a major role in the Indonesian financial sector. Private banks offer financial and banking services. Private banks is financial institutions which capital is owned by individuals. Private banks manage investments to address a client's entire financial situation. Service include protecting and growing assets in, providing specialized financing solution, planning retirement and saving wealth for future generations.

## **1.2 Problem Identification**

Based on the background describe, the question will be discuss in this research is whether size and risk influence the profitability simultaneously and partially? And is there any differences between state and private Islamic banks in Indonesia?

## **1.3 Research Objective**

Based on the problem identification, research purpose and objectives are to identify:

1. The influence of size and risk on profitability simultaneously and partially of state and private Islamic banks in Indonesia.
2. The different of the influence of size and risk on profitability of state Islamic banks and private Islamic banks in Indonesia.

## **2. LITERATURE REVIEW**

### **2.1 Theoretical Approach**

#### ***Banks***

The central bank is the government bank that regulates the money supply in order to maintain macroeconomic stability, while the commercial banks are bank conducting conventional operations and Islamic based banks operate with the aim of obtaining profit. Based on National Act #10 year 1998 types of conventional banks include commercial banks and rural banks. Conventional banks are run by applying the system of interest. While bank are runing the Islamic principles called sharia or Islamic bank (Dendawijaya, 2005).

Banks are the financial institutions that accept deposits and make loans, there include such as commercial bank, savings and loans associations, mutual savings bank, and credit unions (Mishkin, 2010).

### *Islamic Banks*

Islamic banks are commercial banks which operate by Islamic principles or Islamic law and provide services in payment traffic activities (National Act #10 year 1998 on the Amendment National Act #7 year 1992 on Banking). Sharia principles used in Islamic banks are inspired from the main philosophy in muamalah sharia that is the philosophy of partnership and solidarity or sharing of profit and risk so as to realize the economic activity that is more just and transparent (Antonio, 2001). An Islamic bank is a financial institution which have same functions as a conventional bank which collects deposits and provide credit loans but there are some differences which explained in Table 2.1

**Table 4.**  
**The Differences between Conventional Banks and Islamic Banks**

<i>Conventional Bank</i>	<i>Islamic Bank</i>
There is time value of money concept	There is no time value of money concept
There is interest rate	There is no interest rate replace by profit loss sharing <sup>1</sup>
There is no sharia supervisory board	There is sharia supervisory board ( <i>Dewan Pengawas Syariah</i> )

Islamic banks are prohibit to conduct business activities that are contrary with Islamic law, such as alcohol, beer (*khamr*) and do a transaction with interest (*riba*). The development of Islamic banking in Indonesia is fast based on the fact that Islamic banking survived when economic crisis happened in 1998 in Indonesia and in 2008 affected by economic crisis in the United States.

### *Profitability*

The profitability measures include the rate of return on asset (ROA). ROA is the most comprehensive accounting measure of a bank performance. It is an indicator of bank efficiency and a measure of the bank ability to earn

<sup>1</sup> See Al-Qur'an surah Ali Imran 130, Al Baqarah 275 and 278- 279



profit from its total asset. Whereas ROA measures profitability from the point of view of the overall efficiency of a bank's use of its total asset, Return On Asset (ROE) captures profitability from the shareholders perspective.

ROE is important indicator to shareholders and potential investors to measure the bank's ability to obtain net income attributed to the dividend payment. The increase in this ratio means that there is an increase in net profit of the bank concerned, the increase will cause a rise in stock prices of banks (Dendawijaya, 2005).

BOPO also affect the profitability earned by bank, this ratio show the efficiency of bank in operating activities. Smaller value of ratio will cause smaller operational cost so bank profitability will increase (Dendawijaya, 2005).

### ***Bank Size***

The size of the company can be proxied by sales or by use total asset. In banking size is more likely to be seen from the total asset, considering the main product is the financing and investment (Dendawijaya, 2005) Bank size is used to see the level of bank's activity in collecting and distributing funds to customers. The larger the bank's assets, the greater the bank's activity.

The size of the bank has a positive influence on bank profits due to the magnitude of bank's expenditures and revenues. If bank's revenues are greater than expenditures bank profit will increas.

The calculation of the size of the bank can be seen from the total asset owned by a bank. Empirical studies show that developed countries with financial systems tend that are stable have large assets in bank. Greater asset is expected to increase the diversity of products of financial services issued by a bank.

In assessing the banking industry, this study tend to analyze the effects of bank size and bank risk on profitability measures. Best performance is almost always indicated by consistent growth in both size (as measured by total asset) and net income (as proxied by its rates of return).

### ***Credit Risk***

Credit risk refers to risks that occur due to the failure of the debtor, which led to unfulfilled obligation to pay the debt or also called bad loans. If the corporation does not manage risk well, it will likely fail to meet the social and financial objectives. Risks that are not managed properly will result in

financial losses, thus investors, lenders, borrowers and savers tend to lose confidence in the corporation which will result in difficulty in raising fund.

The risk in this research will be proxied by Non Performing Assets (NPA) and Non Performing Financing (NPF). Productive assets whose quality is substandard, doubtful, and loss. Non Performing Financing (NPF) is the risk of financing that has been paid but the loan is not returned. NPF can reduce the level of a bank's profits.

Operating Cost and Operating Revenue (OCOR or in bahasa BOPO) is used as a variable control. OCOR often referred to as the efficiency ratio is used to measure the ability of bank management in controlling operational costs. BOPO'S ideal value for bank's efficient is is 70%-80% (Riyadi, 2006) Indonesia sets the value of OCOR  $\geq 80\%$ .

## 2.2 Empirical Study

**Table 5.**  
**Empirical Studies**

No	Author	Title	Variable	Research Objective	Research Result
1	Shaista Wasizzaman and Hanimas-Ayu Bt Ahmad Tarmizi (2010)	Profitability of Islamic Banks in Malaysia: An Empirical Analysis	Dependent variable: Return On Asset (ROA) Independent variables: Net Interest Margin (NIM), Loan loss reserve to gross loans (LLRL), Equity to total Asset (EA), Net loans to total asset (LA), Size bank (logTA), Gross Domestic Products, Inflation rate.	To find out the influence of bank characteristics and macroeconomic indicator on profitability Islamic banks in Malaysia in 2005-2008.	All variables significant influence profitability, except for size, size variable excluded from the model because it is not significant.
2	Abdel-Hameed M. Bashir (1999)	Risk And Profitability Measures In Islamic Banks: The Case Of Two Sudanese Banks	Dependent variables: Return On Asset (ROA) and Return On Equity (ROE), and Return On Deposits (ROD) Independent variables: ln(size) and risk index (RI).	To find out the effect of size on the performance and risk measure of two Islamic banks in Sudan.	Risk have a negative and significant effect on profitability and size have a negative and significant effect on profitability.

Table 5 Contd...

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3	Yap Voon Choong, Chan Kok Thim, and Bermek Talasbek Kyzy (2009)	Performance of Islamic Commercial Banks in Malaysia: An Empirical Study	<p>Dependent variables: Return On Asset (ROA) and Return On Equity (ROE)</p> <p>Independent variables: credit risk (CR), liquidity (LIQ), bank's capital (CAPITAL), economic condition (ECON), and bank's concentration (CONCERN).</p>	To find out some of indicators of overall bank performance in 11 local Islamic Banks in Malaysia in 2006-2009.	CR and LIQ has a negative and significant effect on ROA, CAPITAL, CONCEN, and ECON has positive and insignificant effect on ROA, CR and CONCERN has positive and significant effect on ROE, CAPITAL and ECON has negative and insignificant effect on ROE, and has positive and insignificant effect on ROE.
4	Orchides Anatama (2014)	Analysis the Effect of Bank Characteristic and Inflation Rate to Islamic Banking Profitability in Indonesia Period 2009:1 - 2012:3	<p>Dependent variable: Return On Asset (ROA)</p> <p>Independent variables: Capital Adequacy Ratio (CAR), Size Bank, BOPO, and Inflation rate.</p>	To analyze the factors that influence return on asset of Islamic Commercial Bank and Islamic Business Unit in Indonesia.	capital adequacy ratio has a positive and significant effect, OCOR and size has negative and significant effect, and inflation rate has a negative effect but not significant on ROA.

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### 2.3 Hypothesis

Based on the research framework, the hypothesis in this study is:

There is an influence of size and risk on profitability simultaneously and partially of state and private Islamic banks in Indonesia.

There is a positive or negative relationship between size at the level of profitability and negative correlation between the level of risk to profitability.

### **3. RESEARCH METHODS**

#### **3.1 Methods**

This research intended to obtain a review of the influence of size and risk on profitability of state and private Islamic banks in Indonesia. The method used in this research is descriptive research use secondary data and previous research related to this topic. While quantitative research use panel data regression model because the data is cross section observation and pooling of time series.

#### **3.2 Sources and Data**

This research will be conducted in Indonesia with a population of Islamic Banks amounting to 6 banks, 3 state Islamic Banks and 3 private Islamic Banks. In this research will be focus in Islamic Banks in the form of state companies and private companies that have a good reporting system and allow the obtained time series and cross section data that all required in this research.

In this research the data needed include:

1. Data obtained from the office of the Bank Indonesia related to size, credit risk, and profitability.
2. Data obtained from the each bank financial statement and literature that have connection with this research.

The number of Islamic banks are retrieved data for this study are state Islamic banks namely Bank Syariah Mandiri, Bank Negara Indonesia Syariah, and Bank Rakyat Indonesia Syariah, and private Islamic banks namely Bank Muamalat Indonesia, Bank Mega Syariah, and Bank Bukopin Syariah so that the financial data to be obtained is the data for 7 years from 2008 to 2014 (data per 3 months). From the results of financial data that deserves to be taken are of 6 Islamic Banks during 28 quartely or will be obtained sample data as much 168 data for each indicator or 1008 data for total indicator.

#### **3.3 Research Model**

Specification of the model used was adopted from several studies that have been done before, namely by Shaista Wasiuzzaman (2010) with some adjustments.

Panel regression model is as follows:

$$\text{ROA}_{it} = \alpha_0 + \beta_1 \text{TA}_{it} + \beta_2 \text{NPF}_{it} + \beta_3 \text{OCOR}_{it} + \beta_4 \text{TA}_{it} \text{D}_1 + \beta_5 \text{NPF}_{it} \text{D}_1 + \beta_6 \text{OCOR}_{it} \text{D}_1 e_{it}$$

$$\text{ROE}_{it} = \alpha_0 + \beta_1 \text{TA}_{it} + \beta_2 \text{NPA}_{it} + \beta_3 \text{OCOR}_{it} + \beta_4 \text{TA}_{it} \text{D}_1 + \beta_5 \text{NPA}_{it} \text{D}_1 + \beta_6 \text{OCOR}_{it} \text{D}_1 e_{it}$$

Where:

ROA = Return On Asset

$\alpha_0$  = Intercept/Constanta

TA = Total asset

NPA = Non Performing Asset

NPF = Non Performing Financing

BOPO = Operating Cost and Operating Revenue

$\beta$  (1 ... 6) = regression coefficient of each independent variable

e = Error term

t = Time

i = Islamic Banks

$\text{D}_1$  = Dummy Variable where 1 = state islamic bank and 0 = private islamic bank

### 3.4 Research Variables

#### *Dependent Variables*

**Return On Asset (ROA):** ROA is the ability of the bank's management to generate profit from the management of its asset. This ratio is calculated by comparing the profits received by the bank with total assets of the bank. The greater the ROA of a bank, the greater the level of bank profits and the better the position of banks in terms of asset utilization.

$$\text{ROA} = \text{Profit} / \text{Asset} \times 100\%$$

**Return On Equity (ROE):** Return On Equity (ROE) is one rentability ratio that can be use to measure profitability from the shareholder perspective. ROE is the ratio between bank net profit with capital. Capitalization is defined here as the ratio of capital to total asset. The probability that a bank will fail varies inversely with the bank's capital ratio. This ratio widely observed by the bank's shareholders and investors in the capital market who want to buy shares of the bank concerned.

$$\text{ROE} = \text{Profit} / \text{Equity} \times 100\%$$

### *Independent Variables*

**Total Asset (TA):** A measurement that is commonly used to determine the financial performance of banks in terms of size is the total asset. Total asset is the final amount of all gross investments, cash and equivalents, receivables, and other asset as they are presented on the balance sheet.

$$\text{Total Asset} = \text{Current Asset} + \text{Fixed Asset}$$

**Non Performing Asset (NPA):** Net Performance Asset is a common term used by financial institutions to measure loans that are uncollectible. Once any borrower has failed to pay the interest of the loan or its principal payments for 90 days, the loan is considered to be a Non Performing Asset.

$$\text{NPA} = \text{Bad Debt Losses} / \text{Total Asset} \times 100\%$$

**Non Performing Financing (NPF):** Non Performing Financing (NPF) is the risk of financing that has been paid but the loan is not returned. NPF can reduce the level of a bank's profits. Non Performing Finance (NPF) is the ratio of financing problem in a bank. When financing problems increase, the risk of reduce the level of profitability is high. If the declining in profitability, the bank's ability to do expansion in financing is reduce and financing rate will be down (Mujahidin, 2005).

$$\text{NPF} = \text{Bad Debt Losses} / \text{Total Credit} \times 100\%$$

### *Control Variable*

**Operating Cost and Operating Revenue (OCOR):** BOPO is often referred to as the efficiency ratio is used to measure the ability of bank management in controlling operational costs. Operating cost ratio is used to measure the level of bank efficiency in its activities, this ratio show the efficient bank in operating activities. Smaller value of ratio smaller the operational cost or more efficient, so bank profitability will increase.

$$\text{BOPO} = \text{Operating Cost} / \text{Operating Revenue} \times 100\%$$

### **3.5 Operationalization of Variables**

The research variables that will be used include variables related to Total Asset as a proxy of size and Non Performing Asset, Non Performing Financing, and BOPO as a proxy of risk as independent variable. While Return On Assets and Return On Equity as a proxy of profitability as dependent variables.

**Table 6.**  
**Operationalization of Variables**

No	Variable	Concept	Indicator
1	Dependent variable: Profitability	Financial parameters To measure the ability of bank to get the profitability in a particular period.	Return On Asset (ROA) $ROA = \text{Profit} / \text{Asset} \times 100\%$
2	Profitability	Financial parameters To measure the ability of bank to get the profitability from the shareholders perspective, the ratio between bank net profit with capital.	Return On Equity (ROE) $ROE = \text{Profit} / \text{Equity} \times 100\%$
3	Independent variable: Size	The amount of total asset in a company in a particular period.	Total Asset $\text{Total Asset} = \text{Current Asset} + \text{Fixed Asset}$
4	Credit Risk	A debt obligation where the borrower has not paid any previously agreed upon interest and principal repayments to the designated lender for an extended period of time.	Non Performing Asset (NPA) $\text{Bad Debt Losses} / \text{Total Asset} \times 100\%$
5	Credit Risk	The risk ratio of financing that has been paid but the loan is not returned.	Non Performing Financing (NPF) $\text{Bad Debt Losses} / \text{Total Credit} \times 100\%$
6	Variable Control	The efficiency ratio is used to measure the ability of bank management in controlling operational costs.	Operating Cost and Operating Revenue (OCOR) $\text{Operating Cost} / \text{Operating Revenue} \times 100\%$

### 3.6 Method of Analysis

The design of data analysis with quantitative approach, ie the ratio analysis and multiple regression statistical methods using Eviews panel data, which is based on the type of data collected and its relevance to the research objectives. This research use unbalance data. In panel data model, unbalance

data can be used. Unbalance data is incompleteness of data at a certain point of time.

Data panel is a combination of time series data (time series) and the data cross (cross section). Use panel data in an observation has several benefits. First, the data panel is a combination of two data time series and cross section are able to provide more data that will be generating degree of freedom is greater. Second, combining information from the data time series and cross section can overcome the problems that arise when there is a problem removal variable (omitted-variables, Widarjono, 2009).

Panel data regression model (in matrix notation) is:

$$Y_{it} = \alpha + \beta X_{it} + e_{it} \quad (3.1)$$

Where:

i: 1, 2, ..., N, shows the Islamic banks (cross-sectional data)

t: 1, 2, ..., T, shows the dimensions of time series (quarterly)

$\alpha$ : coefficient of the intercept

$\beta$ : slope coefficient with dimension  $K \times 1$ , where  $K$  is the number of independent variables

$Y_{it}$ : dependent variable for the  $i$  individual units and units of all time  $t$

$X_{it}$ : independent variables for the  $i$  individual units and units of all time  $t$

E: Error terms

The number of units of time in each individual unit characterize whether the panel data is balanced or not. If each individual unit observed in the same time, the data is said to be balanced panel (balanced panel data). If not all the individual units are observed at the same time or it could be due to missing data in an individual unit, said unbalanced panel data (unbalanced panel data). In this study uses panel data is unbalanced approach. To estimate model with panel data approach, there are several techniques :

#### 1. Method of Common Effect (Pooled Ordinary Least Squares / PLS)

In this estimation PLS is restricted model it is assumed that each individual unit has the same intercept and slope (there is no difference in the dimensions of time slices because the data is combination from cross section and time series). In other words, the panel regression of the data generated will be applicable to individual.



## 2. Fixed Effect (Fixed Effect Model / FEM)

In the FEM method, the intercept in the regression can be different between individuals and time because fixed effect model assume there are variables not included in the model equation that allow for not constant intercept.

## 3. Random Effect (Random Effect Model / REM)

If in fixed effect, the different between individuals and or time is reflected by intercept, in random effect that difference reflected by error. Random Effect Model assume that error may correlated along time series and cross section.

### *Selection of Panel Data Regression Models*

There are two test that could be used to decide which specification of panel data should be used:

#### 1. Chow Test

Chow test or Likelihood Ratio Test is to determine whether the FEM model better than PLS model can be done by looking at the significance by testing the F-test.

The chow test hypothesis as follows:

$H_0$ : Pooled Least Squares (PLS)

$H_1$ : Fixed Effect Model (FEM)

Chow test criteria:

$P\text{-value} \leq \alpha$  reject  $H_0$

$P\text{-value} > \alpha$  not reject  $H_0$

#### 2. Hausman Test

To determine whether the FEM model is better than REM model. The Hausman test statistics follow a statistical distribution of chi-square with degrees of freedom as the number of independent variables.

The hausman test hypothesis as follows:

$H_0$ : Random Effect Models (REM)

$H_1$ : Fixed Effect Model (FEM)

Hausman test criteria:

P-value  $\leq \alpha$  reject H<sub>0</sub>

P-value  $> \alpha$  not reject H<sub>0</sub>

### *Hypothesis Testing*

In testing the hypothesis, a sample statistics must be calculated to knowing null hypothesis is rejected or not rejected.

#### 1. Partial Test

In testing the hypothesis partially use t-test statistics. t-test statistics is to testing each independent variable in the model influence dependent variable significantly.

t-test statistics hypothesis as follows:

(a) To determine the effect of size on profitability:

H<sub>0</sub>:  $\beta_1 = 0$  (TA does not affect the ROA/ROE in Islamic banks)

H<sub>1</sub>:  $\beta_1 \neq 0$  (TA affect the ROA/ROE in Islamic banks)

(b) To determine the effect of credit risk on profitability:

H<sub>0</sub>:  $\beta_2 \leq 0$  (NPA does not affect the ROE in Islamic banks)

H<sub>1</sub>:  $\beta_2 > 0$  (NPA affect the ROE in Islamic banks)

H<sub>0</sub>:  $\beta_2 \leq 0$  (NPF does not affect the ROA in Islamic banks)

H<sub>1</sub>:  $\beta_2 > 0$  (NPF affect the ROA in Islamic banks)

(c) To determine the effect of OCOR on profitability:

H<sub>0</sub>:  $\beta_3 \leq 0$  (OCOR does not affect the ROA/ROE in Islamic banks)

H<sub>1</sub>:  $\beta_3 > 0$  (OCOR affect the ROA/ROE in Islamic banks)

#### 2. Simultaneous Test

F-test is going to be used to test whether all of the independent variables in the model significantly influence the dependent variable simultaneously.

F-test hypothesis as follows:

H<sub>0</sub>:  $\beta_1 = \beta_2 = \dots = 0$  (Size and credit risk simultaneously does not affect the probability in Islamic banks)

$H_1: \beta_1 \neq \beta_2 \neq \dots \neq 0$  (Size and credit risk simultaneously affect the probability in Islamic banks)

### 3. R-Squared calculation

To demonstrate the accuracy of the regression model used the coefficient of determination. The coefficient of determination is a number that indicates the amount of degrees the ability of independent variables of the model identifies the dependent variable. Coefficient of determination ranged between 0 and 1, where getting closer to 1, the independent variables in the regression model are increasingly able to explain the dependent variable in the model.

## 3.7 Classical Assumption Testing

### *Multicollinearity*

Multicollinearity is a violation in classical assumption testing in econometric model which state there is no perfect relationship between the independent variables in a regression equation.

Multicollinearity testing can be done by correlation matrix to calculate the correlation between the independent variables. Data have no multicollinearity when coefficient between two independent variables less than 0.8.

## 4. RESEARCH RESULT AND ANALYSIS

### 4.1 Model Specification

Regression models are used to see how bank size and bank risk are supposed to influence the profitability of Islamic banking in Indonesia and to see whether the influence is different between state and private Islamic banks in Indonesia. A panel data is used in the regression model in this study. It is a combination of 28 periods of time series with 6 cross-sectional data.

To decide whether Pooled Least Squares (PLS) or Fixed Effect Model (FEM) is going to be selected for the ROA and ROE model estimations, Chow Test is performed and to decide whether Fixed Effect Model (FEM) or Random Effect Model (REM) is going to be selected for the ROA and ROE model estimations, Hausman Test is performed. The result can be seen from Table 7.

**Table 7.**  
**Panel Data Specification Test**

<i>Model</i>	<i>Chow Test (FEM is redundant)</i>	<i>Hausman Test (REM specification)</i>
ROA	44.140434*** (5)	6.517963*** (3)
ROE	96.310774*** (5)	97.404549*** (3)

**Note:** \*\*\* is significant at 1%, () is degree of freedom

**Source:** data processing

From the Table 4.1 above we can see that the model specification for estimating ROA is better to be estimated using FEM. Similar with ROA model, ROE model is also better be estimated using FEM. There is another possibility for panel data specification: Random Effect Model (REM). We can see that the model specification for estimating ROA is better to be estimated using FEM. Similar with ROA model, ROE model is also better be estimated using FEM.

### *Estimation Results with Fixed Effects Model (FEM)*

Based on the estimation with panel data approach with Fixed Effect method showed the following results:

**Table 8.**  
**Model Estimation Result for ROA**

<i>Variable</i>	<i>Model 1.1</i>	<i>Model 1.2</i>	<i>Model 1.3</i>
C	8.748953*** [18.56638] (0.471226)	9.325667*** [5.031369] (1.853505)	9.729126*** [5.317223] (1.829738)
TA	-9.18E-09 [-1.065116] (8.62E-09)	-	-
LOGTA	-	-0.278461 [-1.509208] (0.184508)	-0.329909* [-1.829348] (0.180342)
NPF	-0.021594 [-0.248054] (0.087052)	-0.023466 [-0.280795] (0.083570)	-0.106466** [-2.061243] (0.051652)
OCOR	-0.109994*** [-9.997650] (0.011002)	-0.114388*** [-10.42043] (0.010977)	-0.114239*** [-10.38454] (0.011001)

Table 8 Contd...

TA.D1	1.45E-08 [1.370873] (1.06E-08)	-	-
LOGTA.D1	-	0.462963** [2.156073] (0.214725)	0.517125 [2.452524] (0.210854)
NPF.D1	-0.132238 [-1.205729] (0.109674)	-0.133942 [-1.261676] (0.106162)	-
OCOR.D1	0.049394*** [4.378942] (0.011280)	0.054249*** [4.821147] (0.011252)	0.053830*** [4.775474] (0.011272)
Fixed Effects (Cross)			
_MANDIRI – C	-2.120819	-5.719126	-6.265611
_BRI – C	-2.045350	-5.530182	-6.064201
_BNI – C	-2.303012	-5.792510	-6.312998
_MUAMALAT – C	2.564827	6.842704	7.556149
_MEGA – C	3.014927	7.103698	7.644244
_BUKOPIN – C	2.359308	7.056282	7.784448
Adjusted R-squared	0.866513	0.869618	0.869042
F-statistic	85.97808***	88.31345***	96.55914***
Durbin-Watson stat	1.571664	1.616929	1.607055
Akaike info criterion	2.009611	1.986077	1.984182
Schwarz criterion	2.255962	2.232427	2.210003
Hannan-Quinn criter.	2.109712	2.086178	2.075940

**Note:** \*\*\* is significant at 1%

**[] is t-Statistic () is Std.Error**

**Source:** data processing

From Table 4.2 we can see the influence of TA, NPF, and OCOR on ROA simultaneously and partially but in model 1.1 TA is not significant so we change the proxy of size from TA in to Log TA (model 1.2). After we change TA variable to Log TA we can see that dummy for NPF is not significant so dummy for NPF is removed from the model (model 1.3).

First F-test is used to know the influence of independent variable to dependent variable simultaneously by comparing the F-statistic value and F table. From the table F-statistic value is 96.55914 and F table with  $N1=5$   $N2=163$  with  $\alpha = 0.05$  is 2.10. So Size and credit risk simultaneously affect the probability of Islamic banks. TA, NPA, and OCOR influence ROA simultaneously. F-test results answer the research objective hypothesis no 1.

Second t-test is used to know the influence of independent variables to dependent variable partially by comparing the t-Statistic values and t-table. t-table value with  $df (n-k) = 162$  with  $\alpha = 0.05$  is 1.645. The result is Total Asset, Non Performing Financing (NPF), and Operating Cost and Operating Revenue (OCOR) influence ROA partially. t-test results answer the research objective hypothesis no 2.

Regression coefficient for Total Asset (TA) has negative sign and significantly influence Return On Asset on 10% that is equal to -0.33. Each increase of 1 million rupiah on total asset with *ceteris paribus* assumption will decrease by 0.33% ROA by assuming the risk of banks (NPF and OCOR) have constant values.

Regression coefficient for Non Performing Financing (NPF) has negative sign and significantly influence Return On Asset on 5% that is equal -0.11. Each increase of 1% on non performing asset with *ceteris paribus* assumption will decrease by 0.11% ROA by assuming TA and OCOR have constant values.

Regression coefficient for OCOR has negative sign and significantly influence Return On Asset (ROA) on 1% that is equal to -0.11. Each increase of 1% on OCOR with *ceteris paribus* assumption will decrease by 0.11% ROA by assuming TA and NPF have constant values.

From Model 1.3 that has been calculated regression models obtained the coefficient of determination ( $R^2$ ) of 0.869042 or 86.9%, for ROA model. Which means the independent variable in this model can explain the dependent variable at 86.9 % and 13.1% explained by other variables outside the model.

**Table 9.**  
**Model Estimation Result for ROE**

<i>Variable</i>	<i>Model 2.1</i>	<i>Model 2.2</i>
C	91.77094*** [9.01494] (10.018038)	94.00043*** [9.271379] (10.13878)
TA	-4.82E-07*** [-2.880013] (1.67E-07)	-5.46E-07*** [-3.342083] (1.64E-07)
NPA	0.286098 [0.193978] (1.474900)	-1.468641 [-1.482541] (0.990624)
OCOR	-1.092117*** [-5.176062] (0.210994)	-1.117742*** [-5.284385] (0.211518)
TA.D1	4.18E-07** [2.001635] (2.09E-07)	5.06E-07** [2.497869] (2.03E-07)
NPA.D1	-3.169095 [-1.598863] (1.982093)	-
OCOR.D1	0.786696*** [3.618404] (0.217415)	0.795722*** [3.641530] (0.218513)
Fixed Effects (Cross)		
_MANDIRI – C	-2.045221	-9.429878
_BRI – C	-48.01604	-53.17868
_BNI – C	-49.72242	-54.07847
_MUAMALAT – C	52.12760	59.45672
_MEGA – C	33.02984	37.67340
_BUKOPIN – C	0.786696	25.39498
Adjusted R-squared	0.728596	0.725663
F-statistic	38.58368	41.73533***
Akaike info criterion	8.016420	8.021235
Schwarz criterion	8.252040	8.237220
Hannan-Quinn criter.	8.112123	8.108964
Variable	Model 1.1	Model 1.2
Durbin-Watson stat	0.940835	0.888435

**Note:** \*\*\* is significant at 1%, \*\* is significant at 5%

[ ] is t-Statistic ( ) is Std.Error

**Source:** data processing

From Table 9 we can see the influence of TA, NPA, and OCOR on ROE simultaneously and partialy but in model 2.1 dummy for NPA is not significant so dummy for NPA is removed from the model (model 2.2).

First F test is used to know the influence of independent variable to dependent variable simultaneously by comparing the F-statistic values and F table. From the table F-statistic value 41.73533 and F table with  $N_1=5$   $N_2=163$  with  $\alpha = 0.05$  is 2.10. So Size and credit risk simultaneously affect the probability in Islamic banks. TA, NPA, and OCOR influence ROE simultaneously. F-test results answer the research objective hypothesis no 1.

Second t-test is used to know the influence of independent variable to dependent variable partialy by comparing the t-Statistic values and t-table. t-table value with  $df (n-k) = 162$  with  $\alpha = 0.05$  is 1.645. The result is Log Total Asset and Operating Cost and Operating Revenue (OCOR) influence ROE partialy, but Non Performing Asset (NPA) doesn't influence ROE even though the sign is consistent with theory. t-test results answer the research objective hypothesis no 2.

Regression coefficient for Total Asset (TA) has negative sign and significantly influence Return On Equity on 1% that is equal to  $-5.46E-07$ . Each increase of 1 million rupiah on total asset with *ceteris paribus* assumption will decrease by 0.0000000546% ROE by assuming the risk of banks (NPA and OCOR) have constant values.

Regression coefficient for Non Performing Asset (NPA) has negative sign and does not influence Return On Equity that is equal to -1.47. Each increase of 1% on non performing asset with *ceteris paribus* assumption will decrease by 1.47% ROE by assuming TA and OCOR have constant value.

Regression coefficient for OCOR has negative sign and significant influence Return On Equity (ROE) on 1% that is equal to -1.12. Each increase of 1% on OCOR with *ceteris paribus* assumption will decrease by 1.12% ROE by assuming TA and NPA have constant values.

From Model 2.2 that has been calculated regression models obtained the coefficient of determination ( $R^2$ ) of 0.7285663 or 72.86%, for ROE model. Which means the independent variable in this model can explain the dependent variable at 72.86% and 27.14% explained by other variables outside the model.



## 4.2 Classical Assumption Testing

### *Multicollinearity*

Multicollinearity shows a correlation between independent variables with the other independent variables or shows a linear relationship between the independent variables in a regression model. Good model is model which there is no relationship between independent variables.

Multicollinearity testing can be done by matrix coefficient correlation between independent variables (Gujarati, 2008). If coefficient correlation value more than 0.8 there is multicollinearity in the model.

**Table 10.**  
**Matrix Correlation**

	TA	LOGTA	NPA	NPF	BOPO
TA	1.000000	0.676827	0.132400	-0.176172	-0.220781
LOGTA	0.676827	1.000000	0.138314	-0.005519	--0.210514
NPA	0.132400	0.138314	1.000000	-0.200772	0.085911
NPF	-0.176172	-0.005519	-0.200772	1.000000	0.186681
BOPO	-0.220781	--0.210514	0.085911	0.186681	1.000000

Source: data processing

From matrix table above we can see that coefficient correlation values do not show number more than 0,8 so this model is does not have multicollinearity problems.

## 4.3 Economic Analysis

This section will describe the analysis of TA, NPA, NPF, and OCOR on ROA and ROE of Islamic bank in Indonesia.

### *Analysis based on model of Return On Asset (model 1)*

This section will describe the analysis of model estimation result for ROA (model 1.3 see table 4.2).

#### 1. Intercept and fix effect

From regression model, the intercept significant in 1% and have coefficient value of 9.73. Without the influence of the independent variables, Return On Asset (ROA) in Islamic banks will have value of 9.73%, *ceteris paribus*.

From the regression model, the average value of fixed effect for Bank Mandiri is 6.26% lower than the average value of Islamic banks. The average value of fixed effect for Bank BRI is 6.06% lower than the average value of Islamic banks. The average value of fixed effect for Bank BNI is 6.31% lower than the average value of Islamic banks. The average value of fixed effect for Bank Muamalat is 7.55% higher than the average value of Islamic banks. The average value of fixed effect for Bank Mega is 7.64% higher than the average value of Islamic banks. The average value of fixed effect for Bank Bukopin is 7.78 % higher than the average value of Islamic banks.

## 2. Total Asset (TA)

Based on model 1.3 estimation this study shows that the increase in total asset will cause decreasing ROA. These results tend to be different from the conditions in conventional banking in general. This is because the Islamic banking in Indonesia is relatively new and has not been efficient in its operations, showed by the high OCOR ratio. This condition causes profitability to be relatively small, so the increase in assets with the low level of profitability, will cause ROA to become smaller.

The small sized bank have higher ROA and higher capital to asset ratio. A higher capital ratio means a lower leverage multiplier and hence a lower return on equity. This result also consistent with research conducted by Wassiu zaman & Tarmizi, (2010).

Based on the dummy in model 1.3, the influence of TA on ROA of state Islamic banks is not different compared to the influence of TA on ROA of private Islamic banks.

## 3. Non Performing Financing (NPF)

Based on model 1.3 estimation this study shows that the increase in NPF will cause decreasing in ROA. Credit risk as measured by the ratio of bad debt to total credit. Higher NPF shows higher credit risk, or the loan is not returned. The level of income of the bank will be reduced due to delays in funds to be distributed. The level of income of bank will be reduced, while the cost is relatively high, which will reduce profitability, so increasing the NPF will cause a decreasing ROA.

Based on the dummy in model 1.3, the influence of NPF on ROA of state Islamic banks is not different compare to the influence of NPF on ROA of private Islamic banks.

#### 4. Operational Cost and Operational Revenue (OCOR)

Based on model 1.3 estimation this study shows that the increase in BOPO will cause decreasing ROA. OCOR is the ratio of the expenses which are related to bank operations. The higher OCOR ratio, the higher operational cost, and profitability in Islamic banks will be lower. And vice versa, The lower OCOR ratio, the lower operational cost, and profitability in Islamic banks will be higher. This research was supported by the results of previous research by Anatama (2014) that proved that OCOR influence on ROA, the higher operational cost, ROA will be lower.

Based on the dummy in model 1.3, the influence of OCOR on ROA of state Islamic banks is statistically different compared to the influence of OCOR on ROA of private Islamic banks. Average values of OCOR is about 9.73%, average values of OCOR in state banks is lower by about 0.11, for an actual average values of OCOR in state banks is 9.67%.

#### *Analysis based on model of Return On Equity (model 2)*

This section will describe the analysis of model estimation result for ROE (model 2.2 see table 4.3).

##### 1. Intercept and fixed effect

From regression model, the intercept significant in 1% and have coefficient value of 94.00043. Without the influence of the independent variables, Return On Equity (ROE) in Islamic banks will have value of 94.00043%, *ceteris paribus*.

From the regression model, the average value of fixed effect for Bank Mandiri is 9.43% lower than the average value of Islamic banks. The average value of fixed effect for Bank BRI is 53.18% lower than the average value of Islamic banks. The average value of fixed effect for Bank BNI is 54.08% lower than the average value of Islamic banks. The average value of fixed effect for Bank Muamalat is 59.46% higher than the average value of Islamic banks. The average value of fixed effect for Bank Mega is 37.67% higher than the average value of Islamic banks. The average value of fixed effect for Bank Bukopin is 25.39% higher than the average value of Islamic banks.

##### 2. Total Asset (TA)

Based on model 2.2 estimation this study showed that the increase in total asset will cause decreasing ROE. This is accordance with the conditions of

Islamic banking in Indonesia which relatively has a small asset. In the conditions of Islamic banking in Indonesia, the management of fund and has not been efficient in its operations, showed by the high BOPO ratio. This condition causes profitability relatively small, so the increase in asset with the level of profitability low, will cause ROA become smaller, as well as the increasing in equity as one of things that affect the increasing in sources of fund will cause ROE decrease.

The effect of bank size (measured in terms of the value of total asset) on its performance measures is documented in many recent papers. This result is consistent with research conducted by Bashir, (1996).

Based on the dummy in model 2.2, the influence of TA on ROE of state Islamic banks is statistically different compared to the influence of TA on ROE of private Islamic banks.

### 3. Non Performing Asset (NPA)

Based on model 2.2 estimation this study showed that the increase in NPA will cause decreasing in ROE. Non Performing Asset show the ratio between bad debt to total asset. In this study show the result that bad debt loss is relatively high, that will cause income decrease, if the income decrease causes the profitability decrease, that will cause the level of return on equity decrease.

Based on the dummy in model 2.2, the influence of NPA on ROE of state Islamic banks is not different compared to the influence of NPA on ROE of private Islamic banks.

### 4. Operational Cost and Operational Revenue (OCOR)

Based on Model 2.2 this study shows that the increase in BOPO will cause decreasing ROE. OCOR is the ratio of the expenses which are related to the bank operation. The higher the OCOR ratio, the higher operational cost, and profitability in Islamic bank will be lower. And vice versa, The lower OCOR ratio, the lower operational cost, and profitability in Islamic bank will be higher.

Based on the dummy in model 2.2, the influence of OCOR on ROE of state Islamic banks is statistically different compared to the influence of OCOR on ROE of private Islamic banks. Average values of OCOR is about 94%, average values of OCOR in state banks is higher by about 0.79, for an actual average values of OCOR in state banks is 94.79%.

## 5. CONCLUSION

This section will discuss the conclusion based on research result that relates and supports the research.

This research aims to look at the effect of TA, NPA, and BOPO on ROA and ROE 6 Islamic banks in Indonesia and to see the difference in performance between the government and private Islamic banks. Based on analysis that has been done , this research concludes:

The influence of size and risk on profitability simultaneously and partially of state and private Islamic Banks in Indonesia are:

Simultaneously, size (TA) and credit risk (NPA, NPF, BOPO) have a significant influence on Islamic banks profitability (ROA and ROE).

Partially, TA, NPF, and BOPO negatively influence the ROA of Islamic banks and statistically significant.

Partially, TA and BOPO negatively influence ROE of Islamic banks and statistically significant but NPA is insignificant, even though the sign is consistent with theory.

The influence of BOPO on ROA and ROE of state Islamic banks is statistically different compared to the influence of BOPO on ROA and ROE of private Islamic banks. On the other hand, the different influence of TA is only on ROE of private and state Islamic banks.

## 6. SUGGESTION

Banks should be more efficient in running operations to have significant advantage with increasing assets. In order to reduce the amount of financing problems (NPA and NPF) in the future, the Islamic banking accounts need to be more stringent and selective in lending. Banks could improved their profitability by decreasing OCOR or increasing efficiency and decreasing NPA and NPF or minimizing risk.

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