

# The Impact of Credit Risk Management, Bank Size and Origin of Bank on Commercial Bank Performance

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## Abstract

The research is study on the determinants of the performance of commercial banks in Malaysia. The main purpose in this research is to determine the impact of credit risk management, bank size and origin of bank on the bank profitability. The researcher used pre-tax ROA and after-tax ROA as proxies of bank profitability. In addition, the level of non-performing loans ratio (NPLR) is the proxy for level of credit risk which related to credit risk management, while the natural logarithm of total assets is an indicator for the bank size. The findings in this study reveal that the level of NPLR does not have any significant impact to the bank profitability. The bank size showed a positive and significant relationship with the bank performance, while the dummy variable, the origin of bank has a significant effect on pre-tax ROA only.

**Keywords:** Bank profitability, Credit risk management, Bank size, NPLR, ROA.

## I. INTRODUCTION

As a result of the economic downturn in 1997, the level of nonperforming loans increased significantly. Asian countries, including Malaysia, have implemented a mechanism to improve their economic conditions. (Isahak, 2010) In Malaysia, the non-performing loans rose from 6% at 1997 to 22% at the end of 1998. Therefore, to overcome the problems caused by the 1997 economic crisis, Danamodal and Danaharta were enacted under the national economic recovery plan to strengthen the Malaysian financial sector. The Malaysian banking system can be divided into two categories: the banking system and the non-bank financial intermediaries. The banking system consists of three categories: commercial banks, financial institutions and investment banks. There is a total of 27 commercial banks in Malaysia, including eight local banks and 19 foreign banks. The foreign banks play a significant role in the market,

and the strength of local banks will be tested. The weaker banks will be expelled from the market by more efficient banks. In other words, the most efficient banks will have a competitive advantage. (Abd Karim et al, 2010) Hence, cross-border information on bank efficiency is important because it allows policy makers to develop appropriate and sound policies to guide their banking.

## II. PROBLEM STATEMENT

The shareholders and stakeholders of the banks are interested in the banks' profitability and risks. These two important dimensions are the expectations of current investors to banks. Risk management in banking considered a benchmark for determining the banks whether can manage and control their risks. (Tadesse, E., 2014) Generally, the main problem is risk is invisible for the banks and investors until they materialize into

losses. The bank managers and regulators would want to compare the estimated future loss to the bank's current level and to ensure whether the bank has sufficient capital to avert failure. The aim of the commercial banks is to balance the profitability and risk, and hence market risk management is a feasible way to minimize the adverse effect on bank performance.

There have been many studies on the determinants of commercial bank performance. It shows that past researchers are interested in studying the effect of determinants on bank profitability. However, the results may be different since most researchers considered the different factors that affect the performance of banks and the research areas are placed in different countries. (Li and Zou, 2014) In addition, fewer researchers have put the research in Malaysia. In this paper, credit risk management, bank size and bank origin are considered the determinants of bank performance. Therefore, this study will fill the research gap on the impact of credit risk management, bank size, and origin of bank to the profitability of commercial banks.

From the further research on literature reviews of this study, the researcher found that all the indicators are not suitable in managing credit risk. It is because there are some indicators did not bring huge significant effects to the bank profitability from the past researches in credit risk management. Kithinji (2010) Therefore, the researcher of this study will choose the NPLR as the benchmark of credit risk management. Also, the researcher need to determine whether this financial ratio can bring any significant effects to the commercial banks which occur in Malaysia, incorporate of the local banks and foreign banks.

A close look to the size of bank issue. The larger banks can bring more profits and hence the larger banks are outperformed than the small banks. However, the problem is too-large-to-fail doctrine still embed in the conception investors. According

to the cases of Lehman Brother, the investors still worried about the recurrence of global financial crisis. Thus, we need a study to investigate whether the larger size of bank will bring down the bank profits. (Ameur and Mhiri, 2013)

### **III. LITERATURE REVIEW**

#### **Bank Performance**

##### **Definition of Bank Performance**

Bank performance can be defined as how adequately a bank can meet the needs of its stockholders and stakeholders such as employees, depositors and other creditors. (Rose and Hudgins, 2013) From the reports of European Central Bank, it stated that bank performance regards to its capacity to generate sustainable profitability. The term of bank performance also is the reflection of bank's status and how well the banks can use the resources to achieve its objectives. In accordance with Olweny T. (2011), the attention to bank performance has grown after the stream of bank experienced financial distress during the great depression. The past researchers Adebisi and Matthew (2012) who stated that the banks are the core of financial sector in developing economies where the capital market is not strong enough. Due to the banks are vital for economic growth, their performances were highly anticipated by the government regulators. They meet regulatory requirements including conduct the business comply with operating policies and liable in protecting the public interest. Besides, commercial banks have the basic financial purpose for maximizing their value and grant the profit to their shareholders. Therefore, it is important to measure and evaluate the performance of bank.

##### **Return on Assets (ROA)**

Generally, the return on total equity (ROE) and return on average total assets (ROA) are widely used to evaluate bank performance. ROE indicates that how efficiently profits are generated by each dollar of equity invested. It is calculated by

dividing the net income to equity of shareholders. In other words, it will show how efficient the bank's management uses the equity (Alkassim 2005). ROA is the ratio of profit margin and average total assets of the banks. It measures the return of each dollar invested in assets. In other words, it implied that how effectively a bank can generate a return on its based of assets.

There are many past researchers used both ROA and ROE as the proxies of the bank profitability. According to Athanasoglou, P. et al (2006), return on assets (ROA) or return on equity (ROE) used to measure the bank profitability. Tafri et al. (2009) indicated that credit risk brings significant effects on the performances of conventional banks and Islamic banks in Malaysia, and they used both ROE and ROA as the proxy of bank profitability. Based on the empirical studies in Europe, the authors Li and Zou (2014) used both ROE and ROA as the measurement of bank profitability.

Regardless of ROA and ROE have been widely used in determining the bank profitability, however there is an argument between the used of ROA and ROE. Some past researchers may prefer to use either one of the ratios for the benchmark of bank performance. According to Hosna, Manzura and Juanjuan (2009), they chose ROE to measure the profitability in their regression analysis. Based on the empirical studies of Ethiopia, the authors found that the impact of credit risk management on ROE is higher than ROA. (Gizaw, Kebede, and Selvaraj, 2015)

On the other hand, San and Heng (2011) argue that return to asset (ROA) is more common tools to measure the bank profitability. Tadesse, E. (2014) also found that the performance of banks can be explained by the quantifiable financial indicators. He used ROA as an indicator of bank profitability, and his findings shows that the ROA closely tied with the determinants of bank performance. Compared to price measures, the

profitability measures (ROA) is a more explainable indicator in expressed banking industry context, because the pricing measures only focusing on stock price and interest rates which are more related to stock market. In this study, the researcher is use ROA as a proxy of bank performance.

The past researcher Demirgüç and Huizinga (2011) used the pre-tax profits divided by total assets as the proxy for bank performance. However, most of the research use the after-tax profits (net profit) divided by total assets as the indicator of bank profitability. Thus, the researcher in this study use both pre-tax ROA and after-tax ROA as the proxies for the performance of the commercial banks in Malaysia.

## **Credit Risk**

### **Definition of Credit Risk**

In the course of business, taking risk is a corollary because risks are inherent in every business. Bank manager's perception of risk is an uncertain event which trigger loss. In other words, banks are exposed to different types of risk and these risks may bring the negative effect on their performance. Financial risk is one of the common risk types and it can be broadly classified into various types such as market risk, credit risk and operational risk. The difference between the financial risk and non-financial risk is financial risk caused bank losses directly. Due to the difference of risk factors will give the impact on the bank performance, thus the bank managers must know the sources of risk to make the right decision. The bank itself need to calculate the risk and take a proper safety measurement to protect the company. In this study, the researcher explored only credit risk and credit risk management as well as how they affect the bank performance.

Credit risk refers to the risk of loss due to a counterparty (bank's borrower) failure to make

payments at any given time. The potential losses of credit risk are caused by a bank borrower or counterparty who unable to meet his obligations. From the aspect of credit risk, the absence of creditworthiness among the corporate borrowers or individuals also incurred default risk. Based on the literature reviews of Kolapo, Ayeni and Oke (2012), the authors found that credit risk is currently the most significant risk to banks and the key to the business success build upon the measurement and management of the credit risk. Credit risk arise from several sources, including loans and advances, cross-border exposures, investment and off-balance-sheet items such as derivatives products. In accordance with the past research of Li and Zou (2014), they found that the credit risk which occurs in the derivatives market also inflict loss on banks. For instance, downgrade in credit rating may be a potential loss on credit derivatives market.

In summary, as the credit risk can arise from a variety of sources, so the researcher of this study will more focus on the credit risk from loans and advances. Also, the credit risk management will be discussed in the next part of literature review section.

### **Credit Risk Management**

Risk management is a tool that used to control and manage the risk. Risk management in banking are defined as the practices and procedures which implemented by banks for identifying risk, in advance for directing and controlling the potential risk. Based on the risk-based policies, they cover the management process required for risk identifying, measuring and analysing. The basic financial purpose of banks is to enhance the risk-return profile of the bank portfolio which maximizing return and minimizing potential adverse effect. Therefore, financial risk management is a necessary management tools to increase the safety and reliability of the banks.

There are many tools and techniques of risk management incorporate of both qualitative and quantitative, to support various level of management process. To determine the level of financial risk, qualitative method will more suitable to in financial risk analysis. In other words, the financial risk materializes in numerical terms (such as financial ratios), thereby the managers can predict the expected losses. Non-performing loan ratio (NPLR) is a proxy that represents the company whether have measure the potential loss when it exposed in credit risk. It also implied that a probability of the borrowers defaulting on the loan.

From the empirical studies of risk management in Ethiopia, the authors found that the measures of credit risk including, non-performing loans, capital adequacy and loan loss provisions resulting in profitability of Ethiopia banks. NPLR represents the ratio of default loans or being default to total gross loans. The levels of NPLR indicates how efficient the credit risk management employed by the banks. The higher the ratio, the lower the efficiency of credit risk management. (Tadesse, E., 2014) According to Isahak (2010), he indicated that there is an inverse relationship between NPLs and profitability of Nigerian banks. If the ratio of non-performing loan to actual performing loans is lower which means that the bank has lower opportunity exposed in credit risk. By maintaining the lower credit risk exposures, the bank should ensure the borrowers repay the loans at specific periods whereas they can earn a return from the loans.

In summary, the empirical evidences above showed a positive relationship between credit risk management and commercial bank performance. If the banks employ the credit risk management efficiently, it benefits the commercial bank performance. The researcher of this study will discuss further details on NPL in the next part of literature review and comparing the empirical evidence of NPL and CAR.

Non-performing Loan Ratio (NPLR)

### Credit risk in problem loans

Loans that are unsettled on specific due dates are non-performing loans. The mature period of loans usually varies 30-day, 90-day or sometimes 180-day. According to the New Capital Accord of Basel II, the loans which in arrear for exceed 90 days considered as non-performing loans. (Isahak, 2010) By identifying the loans in a non-performing state, the bank conscious of the problems loans. As aforementioned in the part of credit risk, the maturity period will bring impact on the degree of credit risk which incurred default risk. Therefore, it is important to determine the level of NPLR before the bank exposure in default risk.

There are some researchers found a positive relationship between the level of NPLR and the bank profitability. Based the empirical results of Alshatti, A.S. (2015), the past researcher found that the level of NPLR has a positive relationship with banks financial performance as measured by return on assets (ROA). This variable is statically significant to the bank performance. This result is in line with the past researchers Abiola and Olausi (2014) who found that the level of NPLR is positively affected the bank performance, while the p-value of NPLR is significant at 1%. However, in theoretically, the level of non-performing loan ratio has an inverse relationship with the bank profitability.

For the formula of non-performing ratio (NPLR), it represents as non-performing loans (NPLs) divided by total gross loans (TLs). (Tadesse, 2014) Based on the empirical studies in Sweden, the authors used both NPLR and capital adequacy ratio (CAR) as the indicators of credit risk management. The level of NPLR has negatively effect on the bank performance. Moreover, they found that NPLR bring more significant effects to bank profitability than CAR. (Hosna, Manzura, and Juanjuan,2009) Due to the absence of significant relationship between CAR and ROA, thus the researcher of this study will choose NPLRs as the proxy of credit risk

management. By estimating the relationship between NPLs and bank profitability, it can be determined whether the bank profits will decrease if an increase in problem loans. Therefore, this study has developed the hypothesis as below:

#### Hypothesis 1

H<sub>0</sub>: There is no significant relationship between the level of NPLR and pre-tax ROA.

H<sub>1</sub>: There is a significant relationship between the level of NPLR and pre-tax ROA.

#### Hypothesis 2

H<sub>0</sub>: There is no significant relationship between the level of NPLR and after-tax ROA.

H<sub>1</sub>: There is a significant relationship between the level of NPLR and after-tax ROA.

### **Bank Size**

Bank size considered a factor of bank performance. Based on several research studies, top-earning banks have the medium or large in company size. Medium-size or larger banks can take advantages from lower overall operating costs and outstanding operating efficiency. When banks have a sound and effective management system, the banks can shape a larger size of company. The past researcher Alshatti A.S. (2015) used the natural logarithm of total assets (LNTA) as the proxy of bank size, he concluded that the past researchers including Havrylchyk(2006), Kosmidou et al, (2007), Chiou (2009) and Sufian (2009) also used the same proxy in explaining the size of bank. In this study, the researcher used natural log of total assets as the proxy of bank size.

According to Al-Khoury (2011), the author evaluated the financial risks including credit risk, capital risk and liquidity risk; and their impact on Gulf Cooperation Council (GCG) banking industry performance. The author indicated that there is a positive relationship between credit risk and ROA as well as the size of banks has a significant impact on bank profitability (ROA). Furthermore, Al Khatib (2009) found that the size

of Palestinian Commercial Banks has a positive correlation with ROA. Additionally, the researcher expected the bank size has positively effect on the bank performance.

However, there are some empirical studies which concluded that the bank size has negatively impact on the bank profitability. Ameer and Mhiri (2013) found that the size of bank has negative and significant effect on the performance of commercial banks. Besides that, the Buyinza (2010) also found that there is a negative relationship between the bank size and bank profitability. The empirical results showed a statistically significant effect of the size of bank on the bank performance. Therefore, this study has developed the hypothesis as below:

#### Hypothesis 3

H<sub>0</sub>: There is no significant relationship between the bank size and pre-tax ROA.

H<sub>1</sub>: There is a significant relationship between the bank size and pre-tax ROA.

#### Hypothesis 4

H<sub>0</sub>: There is no significant relationship between the bank size and after-tax ROA.

H<sub>1</sub>: There is a significant relationship between the bank size and after-tax ROA.

### **Origin of Bank and Dummy Variables**

In this study, origin of bank is a dummy variable, whether the bank is local in Malaysia or considered as foreign bank. This is the proxy that help to determine origin of bank. In the multiple regression model, the dummy variable may affect the dependent variable. Normally, dummy variable takes only two values 1 and 0, 1 represents presence; 0 represents absence. Thus, the researcher uses this indicator variable to compare the efficiency of foreign banks and domestic banks on the bank performance.

According to Heffernan, S. (2008), the authors use three dummy variables in the multiple regression model for determining bank

performance in China. These dummy variables are listing of a bank's shares, bank reform, and type of bank. The authors expected the listed bank is stronger than non-listed bank in bank performance. Besides, the authors believe that if the bank had reformed, such bank considered more efficiency in its performance. The authors also differ four types of bank, the Big4, national joint stocks, city commercials and rural commercials.

In Malaysia, there is a total of 27 commercial banks which includes eight domestic banks and 19 foreign banks and these banks hold licenses issued by the BNM. (Bnm.gov.my, 2013) Refers to several studies, domestic banks and foreign banks provides efficiency which will give a significant impact on the economics of whole nation. The entry of foreign banks may bring a positive impact to the domestic economy, because they compete with domestic banks by strengthen the availability as well as providing high-quality financial services to customers.

In accordance to O.T. San (2011), the author has compare the efficiency between the foreign bank and domestic bank in Malaysia. He stated that the impact of foreign bank entry has both positive and negative effect. Under the competitive pressures, more modern banking skills and technology of foreign banks may be bringing into the domestic banking industry. Thus, it may bring down the performance of domestic bank. Despite of foreign banks have the strong banking skills, but the long-established domestic banks have the benefits of strong and robustness banking system.

Due to the foreign banks have a huge impact in the market, in the case of competitive effect, the strength of local banks will be put to a test. In contrast, as the local banks are better informed about the locals need, the foreign banks manned themselves to withstand an ordeal. Thus, it is important to investigate the efficiency of domestic bank and foreign bank. According to Abd Karim, Sok and Hassan (2010), they stated that the banks which lost competitive strengths

will be driven out of the market by the efficient banks. In other words, the strong bank will have the competitive advantage. In this study, the researcher expected that the performance of domestic bank is more satisfied than the foreign banks. Therefore, this study has developed the hypothesis as below:

Hypothesis 5

H<sub>0</sub>: There is no significant relationship between the origin of bank and pre-tax ROA.

H<sub>1</sub>: There is a significant relationship between the origin of bank and pre-tax ROA.

Hypothesis 6

H<sub>0</sub>: There is no significant relationship between the origin of bank and after-tax ROA.

H<sub>1</sub>: There is a significant relationship between the origin of bank and after-tax ROA.

**IV. RESEARCH METHODOLOGY**  
**Research Framework**  
*Conceptual Framework*

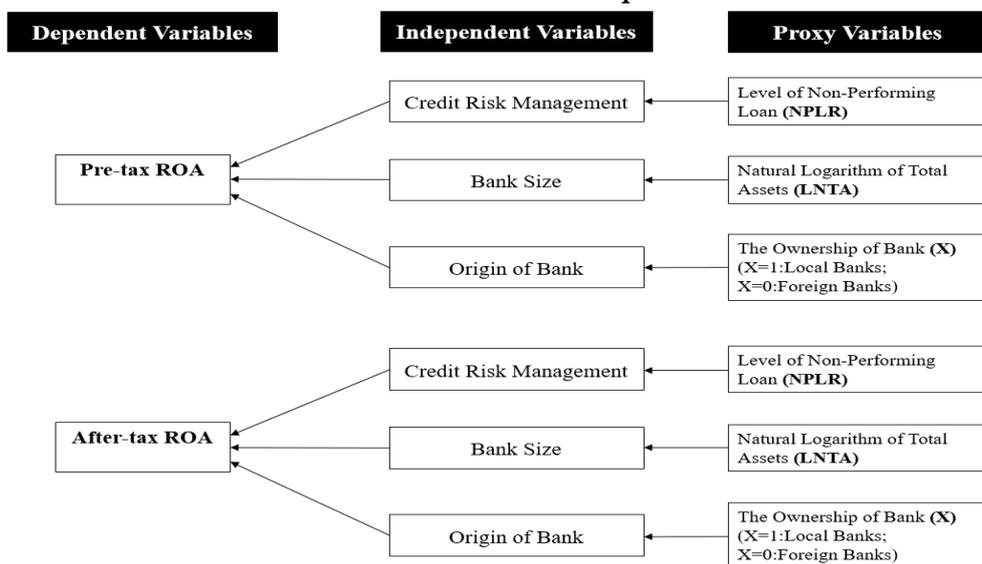


Figure 1: Conceptual Framework

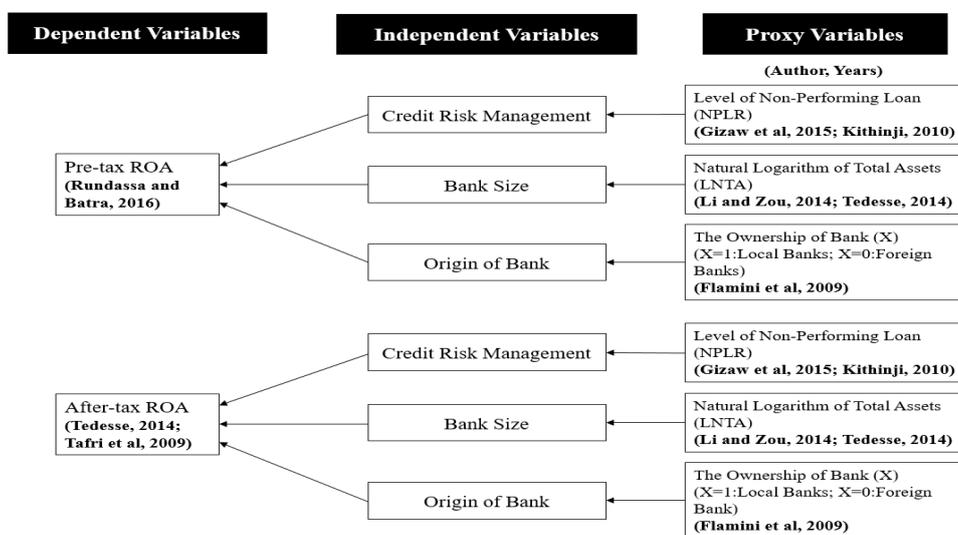


Figure 2: Theoretical Framework

## V. EMPIRICAL RESULTS

### Data Collection

The annual reports of 20 commercial banks in Malaysia were used for data collection, including 8 local banks and 12 foreign banks that operating in Malaysia (refer to Table 3). The relevant data used to compute the calculation of the dependent variable (ROA) and independent variables (NPLR and bank size) are extracted from banks' balance sheets and income statements. Most of the annual reports of banks are obtained from the official website or Bursa Malaysia, and

the data used are Group's data for a period of ten years (2006-2015).

Due to the panel data (cross-sectional time series data) cannot be analyzed by SPSS analysis software, therefore the analysis data will be changed to use cross-sectional data and the time series data for each bank will take an average value. However, the average data does not necessarily have the same number of samples (number of years), as the official website of some banks only provides a few years of annual report.

LOCAL BANKS	Abbr.	FOREIGN BANKS	Abbr.
Affin Bank Berhad	AFFIN	Bangkok Bank Berhad	BKK
Alliance Bank Malaysia Berhad	ALLIANCE	Bank of America Malaysia Berhad	BOA
AmBank (M) Berhad	AMMB	Bank of China (Malaysia) Berhad	BOC
CIMB Bank Berhad	CIMB	Bank of Tokyo-Mitsubishi UFJ (Malaysia) Berhad	MUFJ
Hong Leong Bank Berhad	HLB	Citibank Berhad	CITI
Malayan Banking Berhad	MBB	Deutsche Bank (Malaysia) Berhad	DB
Public Bank Berhad	PBB	HSBC Bank Malaysia Berhad	HSBC
RHB Bank Berhad	RHB	OCBC Bank (Malaysia) Berhad	OCBC
		Standard Chartered Bank Malaysia Berhad	SCB
		The Bank of Nova Scotia Berhad	BNS
		The Royal Bank of Scotland Berhad	RBS
		United Overseas Bank (Malaysia) Bhd.	UOB

Table 1: List of 20 Commercial Banks in Malaysia

### Dependent Variable – ROA

#### *Return on Assets*

Return on Assets (ROA) is a common financial ratio that measures the bank performance in terms of its profitability. It indicates that how efficiently the bank can generate return based on its assets. ROA is the ratio of profit margin and average total assets and it displayed as a

percentage. The general formula of ROA is shown as below:

$$\text{Return on Assets (ROA)} = \frac{\text{Net Profit}}{\text{Average of Total Assets}}$$

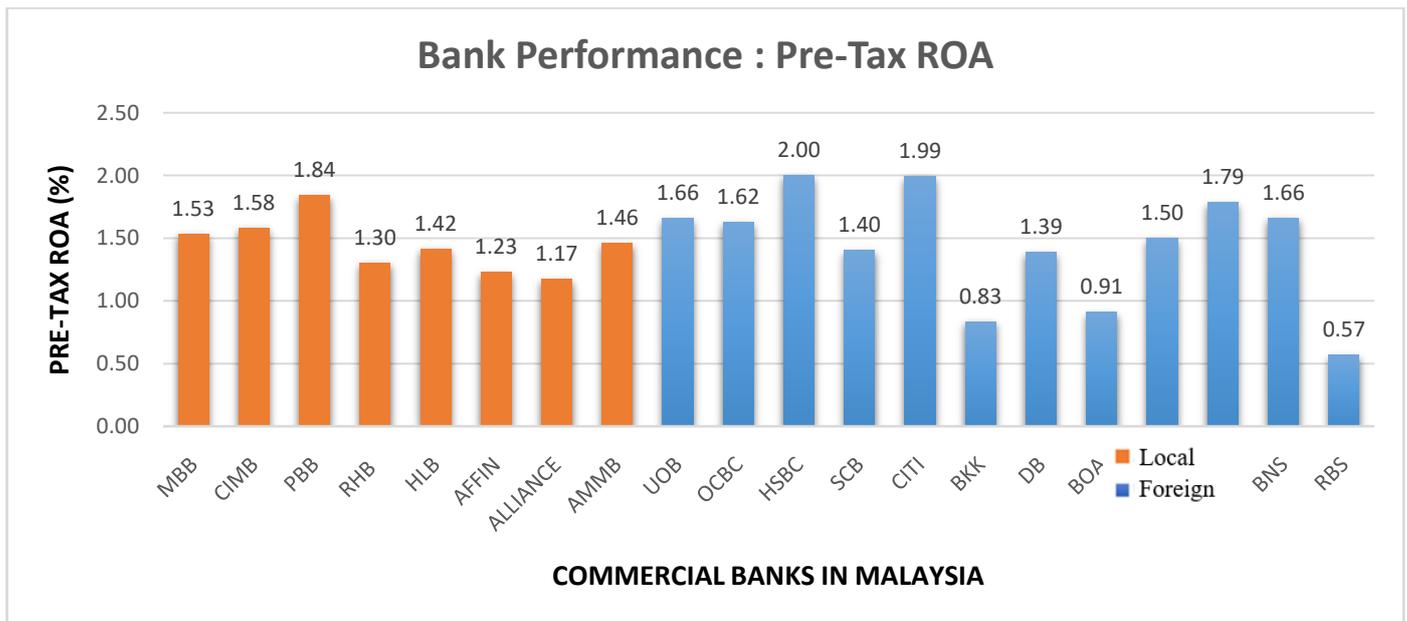
However, ROA can be computed on the different basis, including pre-tax basis and after-tax basis. In the past researches, both pre-tax and after-tax basis were used to computing the return

on assets of banks. For pre-tax ROA, the formula can be expressed as profit before taxation divided by average total assets. On the other hand, the calculation of after-tax ROA is basically same as the general one. In this study, the researcher will use both methods for the measurement of bank profitability.

**PRE-TAX ROA**

The pre-tax ROA of commercial banks were calculated as:

$$Pre - TaxROA = \frac{Profitbeforetaxationandzakat}{AverageofTotalAssets}$$



**Figure 3: Pre-Tax Return on Assets of Commercial Banks**

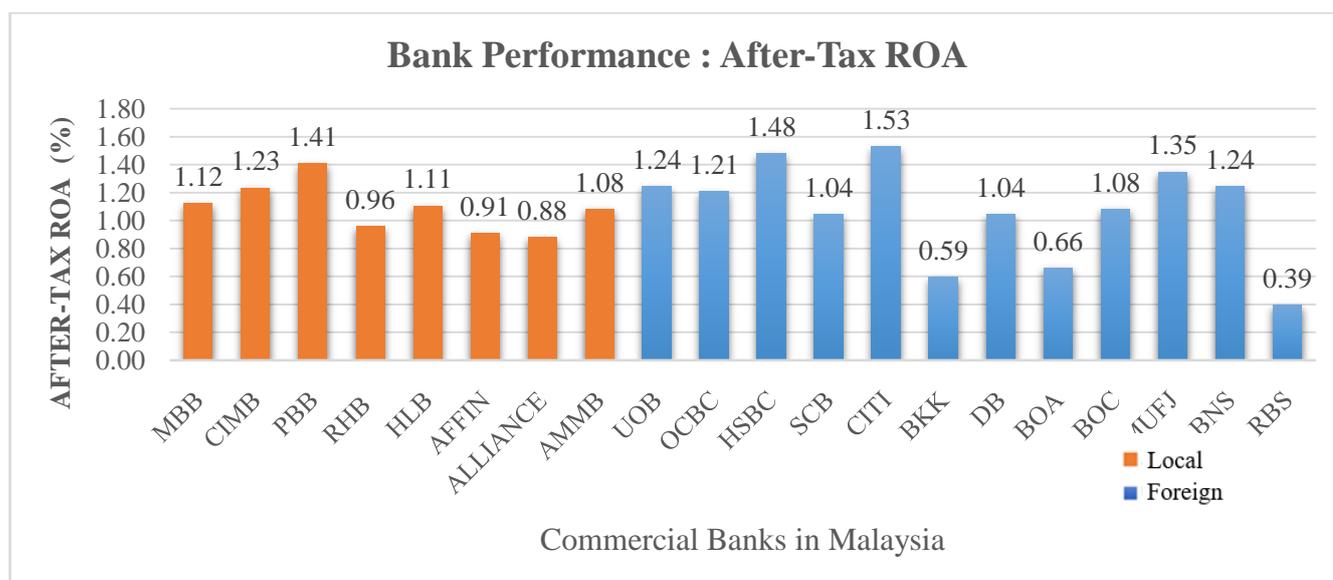
The bar chart above illustrates the profitability of commercial banks in Malaysia in terms of pre-tax return on assets. Based on the overall performance of the banks, all commercial banks had the positive pre-tax ROA which indicated that most of them were effectively managing their assets to generate greater returns. HSBC and Citibank with the highest pre-tax ROA of 2.00% and 1.99% respectively, followed by Public Bank’s pre-tax ROA of 1.84%. For the moderate performance of pre-tax ROA, the local banks were based on the range of 1.17-1.53%,

while the foreign banks were between 1.39-1.79%. There are three foreign banks with pre-tax ROA of less than 1.00%, including BOA 0.91%, BKK 0.83% and RBS 0.57%.

**AFTER-TAX ROA**

The after-tax ROA of commercial banks were calculated as:

$$After - TaxROA = \frac{Profitaftertaxationandzakat}{AverageofTotalAssets}$$



**Figure 4: After-Tax Return on Assets of Commercial Banks**

From the Figure 5, we can see that the level of after-tax ROA is significantly lower than the pre-tax ROA since the taxation and zakat will reduce the bank profit. HSBC has the highest after-tax return on assets of 1.53%, followed by Citibank and Public Bank were 1.48% and 1.41% respectively. For the moderate level of after-tax ROA, the local banks were based on the range of 1.08-1.23%, while the foreign banks were between 1.04-1.35%. There are six commercial banks with less than 1% after-tax profits, including three local banks and three foreign banks. They were RHB 0.96%, Affin 0.91%, Alliance 0.88%, BOA 0.66%, BKK 0.59% and RBS 0.39%.

In summary, HSBC and Citibank both foreign banks have the strong profitability in Malaysia despite their assets size are much lesser than the local banks. Throughout the performance of local banks, their ROA performances are quite average and close to each other, while Public Bank has the strongest profitability among the local ones. On the contrary, there is a disparity in foreign banks performance. The strong ones are efficiently in managing their assets and thereby increasing the profitability, and the banks with low profitability which indicated that their profit margins have fallen or are negative.

#### Independent Variable – NPLR, BANK SIZE Non-Performing Loan Ratio

Non-performing loan ratio (NPLR) is an indicator that the banks used to determine the potential losses from default loans. The reason for determining the level of non-performing loans is to understand whether the bank is exposed to credit risk. A higher NPLR implies that the banks have low efficiency in credit risk management. In this study, the researcher refers to the method for computing the NPLR of each bank and then selects the most commonly used calculation method.

The non-performing loan ratio of commercial banks were calculated as:

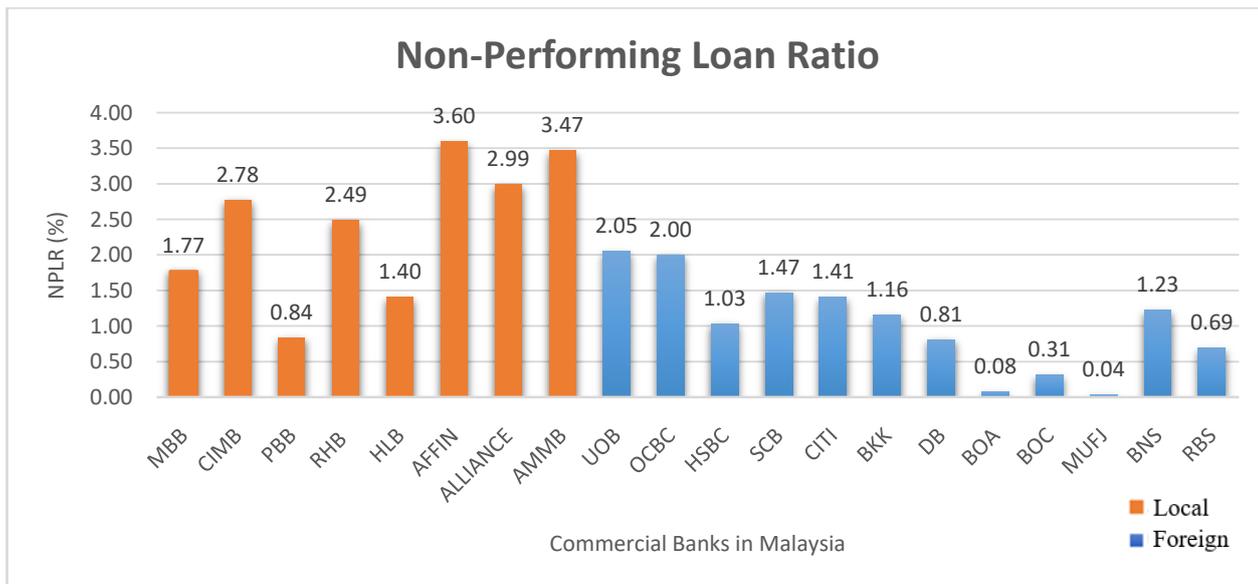
$$\text{Non - Performing Loan Ratio (NPLR)} = \frac{\text{Non - Performing Loans (NPLs)}}{\text{Total Gross Loans (TLs)}}$$

*NPLs*

= *Gross impaired loans, advances and financing – Individual Allowance \**

*TLs = Gross loans, advances and financing – Individual Allowance \**

\*Individual allowance is formerly known as specific allowance



**Figure 5: Non-Performing Loan Ratio of Commercial Banks**

Based on the bar chart above, it illustrates the performance of non-performing loan ratio for both local and foreign banks in Malaysia. The NPLR of local banks is relatively high, compared with the low ratio of foreign banks' non-performing loan. The main reason is that the total loan size of local banks is far greater than the foreign bank, so the local banks face a higher probability of default loans. From the performance of local banking industry, despite some of the local banks such as Public Bank, Maybank and Hong Leong Bank have the large total loan size, but their NPLRs (PBB-0.84%, HLB-1.40% and MBB-1.77%) are relatively low in the industry.

The other five domestic banks which including AFFIN, AMMB, ALLIANCE, CIMB and RHB have the highest NPLR among the 20 commercial banks in Malaysia, their NPLRs were 3.60%, 3.47%, 2.99%, 2.78% and 2.49% respectively. From the performance of foreign banking sector, the MUFJ, BOA, BOC's NPLRs are much lower compared to their competitors, their NPLRs are between 0.04% to 0.31%. This implied that these banks can easily manage their non-performing loans based on smaller total loan

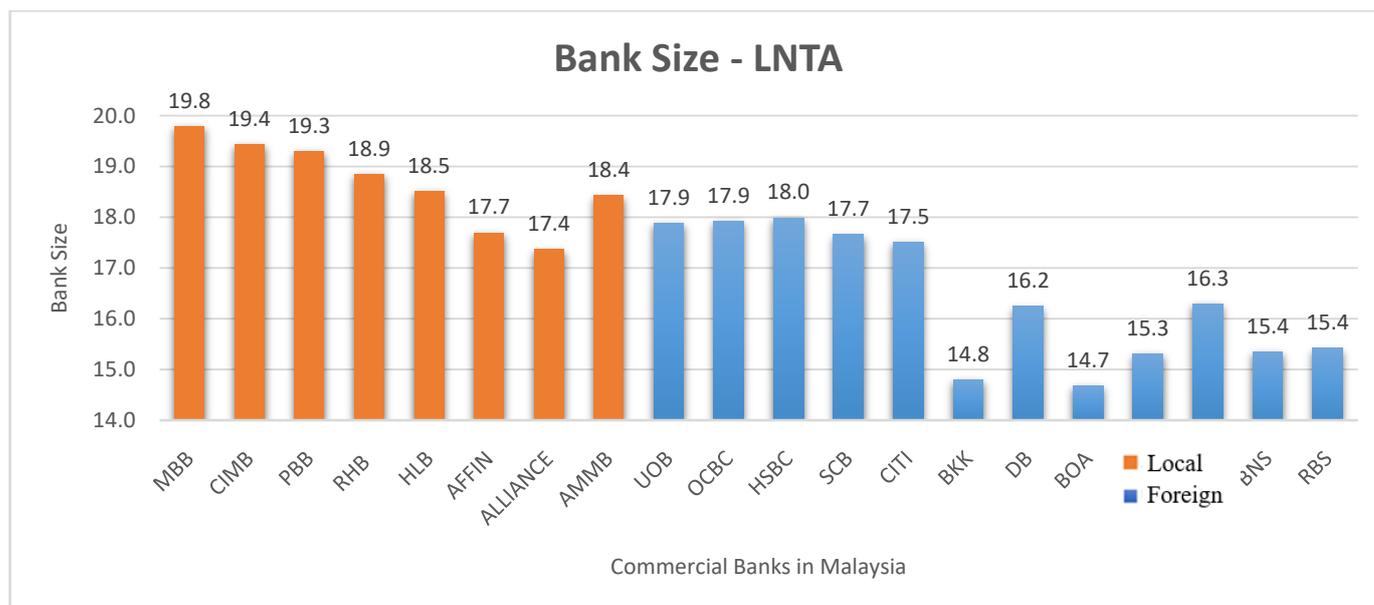
size. In addition, the NPLRs of the other nine foreign banks are at a moderate level which ranging from 0.69% to 2.05%.

**Bank Size**

With the presence of foreign banks in the local market, the interbank competitions are becoming intensely, while the banks also face new and higher costs to implement complex new regulations. The essence of bank competitiveness allows the banks to maintain the good development capacity and improving profitability is the driving force for further development. The size of bank and profitability are relevant, the larger the bank scale, the greater the profitability to achieve economies of scale. By calculating the size of Malaysian commercial banks, researchers can see if local banks have a local advantage over foreign banks or whether foreign banks threaten the local ones.

The bank size of commercial banks were calculated as:

$$\begin{aligned}
 & \textit{Bank Size} \\
 & = \textit{Natural Logarithm of Total Assets} \\
 & = \textit{Ln (Total Assets)}
 \end{aligned}$$



**Figure 6: The Bank Size of Commercial Banks**

From the bar chart above, we can see that the bank size of local banks is relatively high compared to foreign banks. There are six local banks including MBB, CIMB, PBB, RHB, HLB and AMMB have the largest scale among their competitors, where the bank size is in the range from 18.4 to 19.8 (total assets size: RM103.8 bil to RM425.3 bil). The bank size of other two local banks such as AFFIN and ALLIANCE are at the moderate level, with 17.7 (RM49.9 bil) and 17.4 (RM36.2 bil) respectively. There are five foreign banks have the moderate scale of business in the local market, the bank size in between 17.5 to 18.0 (RM40.5 bil to RM67.1 bil). On the other hand, the size of other foreign banks is smaller than local ones, probably because of the less demand for foreign banks in the local market.

**Descriptive Statistics**

Descriptive Statistics in SPSS software is the common tool that helps the researcher to organize and summarize data. When the researchers first view the dataset, descriptive statistics provide a quick summary so that they can get an idea what the data shows. In this study, the key outputs of descriptive statistics are mean, minimum and maximum levels, standard deviation and numbers of observations (N). The mean shows the average of data; standard deviation is used to measure the dispersion. In other words, the standard deviation is an indicator helps to determine the data spread out from the mean.

Bank Origin	Particulars	Mean	Minimum	Maximum	Std. Deviation	N
<b>Local Banks</b>	NPLR (%)	2.417	0.836	3.598	0.993	8
	LNTA	18.68	17.37	19.79	0.844	8
	Pre-Tax ROA (%)	1.442	1.171	1.841	0.216	8
	After-Tax ROA (%)	1.087	0.880	1.409	0.176	8
<b>Foreign Banks</b>	NPLR (%)	1.022	0.038	2.051	0.671	12
	LNTA	16.43	14.69	17.99	1.301	12
	Pre-Tax ROA (%)	1.444	0.567	2.002	0.456	12
	After-Tax ROA (%)	1.070	0.392	1.526	0.355	12

All Banks	NPLR (%)	1.58	0.038	3.598	1.056	20
	LNTA	17.33	14.69	19.79	1.588	20
	Pre-Tax ROA (%)	1.443	0.567	2.002	0.371	20
	After-Tax ROA (%)	1.077	0.392	1.526	0.291	20

Table 2: Summary Output of Descriptive Statistics

From the table 2 as shown above, the overall average of NPLR for all commercial banks is 1.58%. The local banks have the highest mean of NPLR with the value of 2.417% compared to the foreign banks with the average value of 1.022%. This is because the local banks have the larger total loans size which indicated that there is a higher probability to incur default loans risk. Furthermore, we can see that the NPLR of the banks is placed at the minimum level 0.038%, while the maximum level of NPLR with approximately 3.6%. The standard deviation of NPLR for all commercial banks is 1.056%, this low standard deviation shows that the data are close to the average.

The overall average is equals to 17.33 throughout the size of commercial banks in Malaysia. As the total assets size of local banks are larger, therefore the local banks have the higher mean of bank size with 18.68, while the foreign banks have the lower mean with 16.43. The size of commercial banks is based on the range from 14.69 to 19.79. The standard deviation of bank size for all banks is equals to 1.588% which is higher than the standard deviation of NPLR. This indicated that there are more data spread out from the mean.

Moreover, the average of pre-tax ROA for both local banks and foreign banks are close to 1.44%. Additionally, the difference between the

average of after-tax ROA for local banks and foreign banks merely 0.01%. The pre-tax ROA of foreign banks are in the larger range of 0.567% to 2.002%, while the local ones are in the lower range of 1.171% to 1.841% which demonstrate that the profitability efficiency of local banks are more stable than the foreign competitors. Similarly, the after-tax ROA of local banks were in between 0.88% to 1.409% (difference of 0.529%-smaller range) and the foreign ones were in between 0.392% to 1.526% (difference of 1.134%- larger range). Lastly, the standard deviation of pre-tax ROA and after-tax ROA are quite low and it implied most of the data are clustered to the average.

### Multiple Regression Model

$$\text{Model 1} \quad : \quad \text{Pre-TaxROA} = \alpha + \beta_1 \text{NPLR} + \beta_2 \text{LNTA} + \beta_3 X + \varepsilon$$

$$\text{Model 2} \quad : \quad \text{After-TaxROA} = \alpha + \beta_1 \text{NPLR} + \beta_2 \text{LNTA} + \beta_3 X + \varepsilon$$

Return on Assets is expressed as ROA which represents the profitability of the commercial banks. LNTA is an indicator of the bank size which represents the natural logarithm of total assets. Due to the number of bank size is a very huge number, so we find the natural logarithm of the number. The dummy variable denoted as X which is a proxy for bank origin, where X= 0 represents foreign bank in Malaysia, X= 1 represents domestic bank in Malaysia.

### Result of Multiple Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.708 <sup>a</sup>	.502	.408	.00285527
2	.708 <sup>a</sup>	.501	.408	.00223643

a. Predictors: (Constant), NPLR, LNTA, X

Table 3: Model Summary

From the summary output, it shows the R square for both models are quite similar which equal to 0.502 and 0.501 respectively. For the interpretation of R square, the more numbers of predictors in the model, the higher the R square value, which is the so-called over-fitting model. The R square may be misleading in predicting the accuracy of the regression model. And yet, the adjusted R square helps to prevent the overfit

model problem, therefore the adjusted R square has more explanatory power than the R square. In this study, the adjusted R square for both models are 0.408 which indicate that about 40.8% of variations in this model. In other words, there are 40.8% of the dependent variables (pre-tax ROA and after-tax ROA) are explained by the independent variables (the determinants of bank performance).

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.000131	3	.000044	5.366	.009 <sup>b</sup>
	Residual	.000130	16	.000008		
	Total	.000262	19			
2	Regression	.000080	3	.000027	5.364	.009 <sup>b</sup>
	Residual	.000080	16	.000005		
	Total	.000161	19			

a. Dependent Variable: (1) PreTaxROA; (2) AfterTaxROA

b. Predictors: (Constant), NPLR, LNTA, X

**Table 4: ANOVA**

In simply, the F-test in the regression analysis helps to assess more than one regression coefficients at the same time. The significant level (p-value) of F-test is used to determine whether the linear relationship of the regression equation is significant. According to Frost. J (2015), he explained that the F-test of the overall significance is used to compare a model without predictors (intercept-only model) and model specified with predictors.

The null hypothesis is stated as the model specified with predictors equals to the intercept-only model, while the alternative hypothesis at

least one coefficient can be found in the regression model. The null hypothesis represents the model specified with predictors equals to the intercept-only model, while the alternative hypothesis is represented as at least one of the coefficients in the regression model is not equals to zero. In general, the significance level is 0.05. From the table above, the significance F (or the p-value of F-test) is 0.009 which means that the null hypothesis can be rejected. Therefore, the F-tests shows that both models in this study provides a better fit than intercept-only model.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.024	.010		-2.498	.024
	NPLR	-.063	.084	-.179	-.748	.465
	LNTA	.002	.001	1.026	4.012	.001
	X	-.005	.002	-.614	-2.183	.044
2	(Constant)	-.020	.008		-2.568	.021
	NPLR	-.053	.066	-.192	-.801	.435
	LNTA	.002	.000	1.025	4.008	.001
	X	-.003	.002	-.574	-2.039	.058

a. Dependent Variable: (1) PreTaxROA; (2) AfterTaxROA

**Table 5: Coefficients**

Based on the regression results above, the multiple regression models evolve into the following equations after including the coefficients and the dummy variables.

Model 1:

$$Pre - TaxROA = -0.024 - 0.063 * NPLR + 0.002 * LNTA - 0.005 * X$$

Model 2:

$$After - TaxROA = -0.020 - 0.053 * NPLR + 0.002 * LNTA - 0.003 * X$$

where X= 1 represents the local banks, and X= 0 represents the foreign banks

**For Model 1:**

$$\begin{aligned} \text{Pre-Tax ROA of local banks} &= - 0.024 - 0.063 * NPLR + 0.002 * LNTA - 0.005 (1) \\ &= - 0.029 - 0.063 * NPLR + 0.002 * LNTA \end{aligned}$$

$$\begin{aligned} \text{Pre-Tax ROA of foreign banks} &= - 0.024 - 0.063 * NPLR + 0.002 * LNTA - 0.005 (0) \\ &= - 0.024 - 0.063 * NPLR + 0.002 * LNTA \end{aligned}$$

**For Model 2:**

$$\begin{aligned} \text{After-Tax ROA of local banks} &= - 0.020 - 0.053 * NPLR + 0.002 * LNTA - 0.003 (1) \\ &= - 0.023 - 0.053 * NPLR + 0.002 * LNTA \end{aligned}$$

$$\begin{aligned} \text{After-Tax ROA of foreign banks} &= - 0.020 - 0.053 * NPLR + 0.002 * LNTA - 0.003 (0) \\ &= - 0.020 - 0.053 * NPLR + 0.002 * LNTA \end{aligned}$$

From the analysis results of model 1, the coefficient for the non-performing loans ratio (NPLR) is -0.063. However, this independent variable is insignificant because the significance level is 0.465 which is not under the conditions of 0.05 of critical level. As this variable is not significant to the pre-tax ROA, so it indicated that there is no significant relationship between the level of NPLR and pre-tax ROA. Besides that, the size of commercial banks showed a positive effect to pre-tax ROA as the coefficient of bank size equals to 0.002. It indicated that as the bank size increase, the pre-tax ROA also will also increase. From the analysis output, the bank size is statistically significant to bank performance because the p-value is 0.001 which is below the 0.05 of significant level. For model 1, the p-value

of the dummy variable is 0.044 which indicated that this dummy variable has the significant effect to the pre-tax ROA, since this variable is significant at 5%. If the dummy variable is significant, so the ownership has a significant impact on the bank profitability. Compared to local banks, the foreign banks (denoted as X=0) which have less impact on pre-tax ROA. It is because this dummy variable become 0 in the regression equation, so only the effects of the constants, NPLR and bank size will be considered in the model. Hence, the equation showed that the foreign bank has a term lesser than local bank.

From the analysis results of model 2, the coefficient of NPLR is -0.053 which has a negative effect on after-tax ROA. Yet, the significance level of NPLR in this model is above

0.05, where the p-value equals to 0.435, so there was a statistically insignificant effect of NPLR on bank performance in aspect of after-tax ROA. In addition, the coefficient of bank size is 0.002, where this positive coefficient showed that when the bank size increased by 1%, after-tax ROA will increase by 0.2%. The p-value of bank size is 0.001 which below 0.05 critical level, therefore there was a significantly effect of bank size on

after-tax ROA. Lastly, the coefficient of the dummy variables is -0.003 which implied that the local banks (denoted as X=1) are negatively affected the bank performance that is reducing the after-tax ROA. The p-value of the dummy variable is 0.058 which is not significant at 5%, so there was a statistically insignificant impact of bank origin on after-tax return on assets

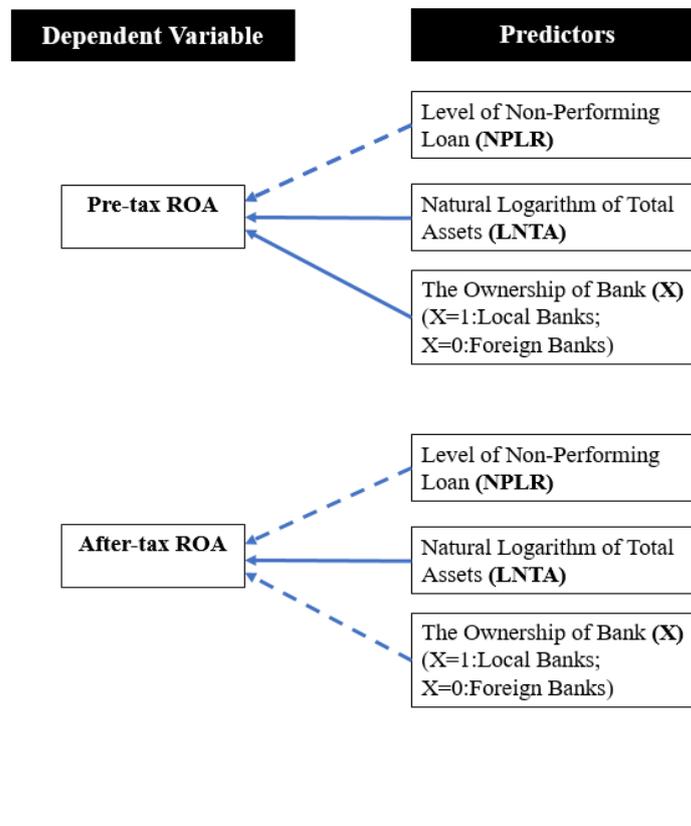


Figure 7: Summary Diagram of Regression Results

## VI. RESEARCH FINDINGS

Research Objectives	Research Hypothesis	Decision
<u>Research Objective 1:</u> To determine the relationship between the level of NPLR and bank profitability.	<u>Hypothesis 1:</u> H <sub>0</sub> : There is no significant relationship between level of NPLR and pre-tax ROA. H <sub>1</sub> : There is a significant relationship between level of NPLR and pre-tax ROA.	Accept H <sub>0</sub> (p>0.05)
	<u>Hypothesis 2:</u> H <sub>0</sub> : There is no significant relationship between level of NPLR and after-tax ROA.	Accept H <sub>0</sub> (p>0.05)

	H <sub>1</sub> : There is a significant relationship between level of NPLR and after-tax ROA.	
<u>Research Objective 2:</u> To determine the relationship between the bank size and bank profitability.	<u>Hypothesis 3:</u> H <sub>0</sub> : There is no significant relationship between level of NPLR and pre-tax ROA. H <sub>1</sub> : There is a significant relationship between level of NPLR and pre-tax ROA.	Reject H <sub>0</sub> (p<0.05)
	<u>Hypothesis 4:</u> H <sub>0</sub> : There is no significant relationship between level of NPLR and after-tax ROA. H <sub>1</sub> : There is a significant relationship between level of NPLR and after-tax ROA.	Reject H <sub>0</sub> (p<0.05)
<u>Research Objective 3:</u> To determine the relationship between the origin of bank and bank profitability.	<u>Hypothesis 5:</u> H <sub>0</sub> : There is no significant relationship between level of NPLR and pre-tax ROA. H <sub>1</sub> : There is a significant relationship between level of NPLR and pre-tax ROA.	Reject H <sub>0</sub> (p<0.05)
	<u>Hypothesis 6:</u> H <sub>0</sub> : There is no significant relationship between level of NPLR and after-tax ROA. H <sub>1</sub> : There is a significant relationship between level of NPLR and after-tax ROA.	Accept H <sub>0</sub> (p>0.05)

**Table 6: Summary of Research Objectives and Hypothesis**

Discussion of Research Findings

**Non-Performing Ratio**

This research aims at determining the relationship between the level of NPLR and bank profitability. From the analysis results of multiple regression models, the researcher found that the level of non-performing loan ratio is negatively affected the bank financial performance in terms of both pre-tax and after-tax return on assets. In addition, this variable was statistically insignificant in explaining the effect of non-performing loan ratio on the return on assets of commercial banks in Malaysia as the p-value of the level of NPLR is not significant at 5%.

Therefore, the both null hypotheses cannot be rejected in this study.

The result in this study is supported by the past researcher Kithinji (2010) who found a negative relationship between the level of non-performing loans (NPLNs) and bank profits (ROTA). Based on the results of the study, it showed that the level of NPLNs has no significant effect on the profits of commercial banks. It implied that the amount of credit and non-performing loans is not a major factor affecting the profits of commercial banks. Besides that, the result in this study is consistent with the study of Rufai (2013) who aimed at determining the

relationship between the level of credit risk (NPL/TL) and the profitability of Union Bank plc. He found that the non-performing loan to total loans has a negative effect on the bank profitability (ROA). Yet, the p-value of non-performing loan to total loans is not significant at 5%. It indicated that the level of credit risk has no significant effect on the bank profitability.

However, there are some empirical studies are inconsistent with the results of this study. The past researcher Tadesse (2014) aimed to examine the impact of credit risk on the performance of Ethiopian commercial banks. Based on his research findings, he found that the level of provision to total loan (PRTL) has a negative relationship with the bank profitability (ROA). Also, this independent variable showed a statically significant effect to the return on assets. This study finding is in line with the findings Felix and Claudine (2008), which claimed that the ratio of non-performing loan to total loan has the negative effect on bank profitability. The higher the level of NPLR, the lower the return of commercial banks, since the high accumulation of unpaid loans leads to high credit risk.

Moreover, the past researchers Gizaw, Kebede, and Selvaraj (2015) who also investigated the relationship between credit risk management and the profitability of commercial banks in Ethiopia. Based on the regression results, the authors found that non-performing loan has a significant negative effect to profitability in aspects of ROA and ROE. Similarly, a previous study by Li and Zou (2014) examined the impact of credit risk management on the performance of 47 largest commercial banks in Europe. It showed that the relationship between NPLR and ROA and between NPLR and ROE was statistically significant in their empirical findings.

Despite most of the past empirical studies given that the non-performing loans ratio has a significant impact on the bank profitability, but

the empirical results of this study showed that there is no significant relationship between the level of non-performing loan ratio and the profitability of the commercial banks in Malaysia. An insignificant p-value suggests that changes in the independent variables (predictors) are not associated with changes in the dependent variable. (Frost. J, 2013) In this study, the researcher found that the profitability of the banking industry in Malaysia does not change with the levels of the non-performing loans ratio.

The level of non-performing loan ratio which mainly measures the level of credit risk, where the high level of NPLR indicates that the commercial bank has the greater probability exposed to credit risk. In this study, the level of NPLR is an indicator of credit risk management for the commercial banks in Malaysia. The researcher expected that the level of NPLR has a significant impact on bank profitability (ROA), but the empirical results shows that there is no significant relationship between the level of NPLR and bank profitability. It is not to say that the non-performing loans would not affect the bank performance, but rather to say that the fluctuations of the NPLR level is not in line with the changes in bank profitability. For example, the increase in non-performing loan ratio does not mean that the banks' profitability will reduced. In summary, the non-performing loans is not the major determinant of bank performance for commercial banks in Malaysia.

### **Bank Size**

In this study, the researcher aims at determining the relationship between the bank size and bank profitability. From the analysis results of multiple regression models, the researcher found that the bank size is positively affected the bank financial performance in terms of both pre-tax and after-tax return on assets. In addition, this variable was statistically significant in explaining the effect of the bank size on the

return on assets of commercial banks in Malaysia as the p-value of the level of NPLR is significant at 5%. Therefore, the both null hypotheses should be rejected in this study.

Most of the empirical studies are related to the determinants of bank performance, and the bank size is a common factor for researchers to investigate the relationship between this variable and the bank profitability. The past researchers Ayadi and Boujelbene (2012) aimed at identifying the influence of bank size on the bank profitability of twelve Tunisian Deposit Banks. They found that the size of bank has the significant positively relationship with the return on assets (ROA), their empirical result is consistent with the results of this study. Based on the empirical studies in Europe, Li and Zou (2014) found that there is a positive and significant relationship between LNTA and ROA of European commercial banks, where the p-value of LNTA is significant at 5%.

However, the result in this study is contrary to Ameer and Mhiri (2013) who found that the larger banks have the negative effect on bank profitability. This results is supported by the past researcher Buyinza (2010) who found that the negative relationship between the bank size and the profitability of commercial banks in Sub-Saharan Africa. The empirical results showed a statically significant impact of bank size on the bank profitability. The reason for this negative relationship is that the larger banks have more agency costs, the cost of bureaucratic procedures and other costs associated with managing large corporations. In addition, the past researcher Said and Tumin (2011) found that the bank size has no any significant impact on the performance of commercial banks in both countries China and Malaysia.

In conclusion, the researcher found that the bank size has a positive and significant effect on bank profitability of commercial banks in

Malaysia. Most of the local banks in Malaysia have the larger size in assets, therefore they have the higher ability to generate greater returns from their assets. This empirical results is in line with the past researcher Sinkey (1991) who found that the large-scale commercial banks are more profitable than small-scale ones. The positive coefficient of the bank size indicated that the increase in bank size, the greater the market power to achieve economies of scale, and thereby the increase in the bank profitability. (Flamini et al, 2009) The local banks have a local advantage over the foreign ones as they can achieve higher returns. Hence, it can be said that the impact of bank size on profitability can be anticipated theoretically.

### **Dummy variables**

In this study, the researcher aims at determining the relationship between the origin of bank and bank profitability. From the analysis results of multiple regression model 1, the researcher found that the dummy variable is negatively affected the local banks financial performance in terms of pre-tax return on assets. The p-value of the dummy variable is 0.044 which is significant at 5%. There is a significant relationship between the origin of bank and pre-tax ROA. So, the null hypothesis (for H5) cannot be rejected. For model 2, the empirical results showed that the dummy variable is not significant at 5% which means that the ownership of the banks (either local banks or foreign banks) has no significant effect on the after-tax ROA. Therefore, the null hypothesis (for H6) cannot be rejected.

If the dummy variable is significant, so the ownership has a significant impact on the dependent variable. Since the p-value of the dummy variable has the significant effect on pre-tax ROA, therefore it can be interpreted as the ownership of banks has more explanatory power to pre-tax ROA. From the empirical results of model 1, the equation showed that the foreign bank has a term lesser than the local bank, as the

foreign bank equals to 0 in the equation. In other words, the foreign bank may perform better than the local ones.

The results in this study is consistent with the empirical results of past researcher Flamini et al (2009) who also used a dummy for the ownership of banks. The past researcher found that the foreign banks may have the advantages of technological and efficiency. Additionally, the past researcher expected that the foreign banks may have a higher profitability if these advantages offset with the informational advantages of domestic banks. Moreover, the foreign banks can achieve a higher profitability, if they are not operating in the competitive environment and these advantages can be able to translate into returns. However, the result of this study is contrary with the past researcher Heffernaan S. (2008) who found that there is no relationship between the ownership of banks and the bank profitability.

In this study, the performance of the foreign banks is relatively high because of many reasons which caused by the independent variables. From the perspectives of independent variables, the total loans size of foreign banks are relatively smaller than the local banks which indicated that the foreign banks has the low probability exposed to credit risk, therefore the foreign banks can maintain in a low level of NPLR. As a result, the pre-tax ROA of foreign bank is higher than the local bank.

## **VII. CONCLUSION**

### **Summary of Research Findings and Recommendations**

In the beginning of this study, the researcher aimed at determining the impact of credit risk management, bank size and origin of bank on the profitability of commercial banks in Malaysia. This was done by collecting the data from the annual reports of 20 commercial banks,

including eight local banks and 12 foreign banks in Malaysia. In this research, the researcher constructed two multiple regression models for determining whether the IVs (level of NPLR, bank size and origin of bank) have bring any significant effect on the DVs (pre-tax ROA and after-tax ROA).

Based on the empirical results, there is a negative relationship between the level of non-performing loans ratio and the bank profitability in terms of both pre-tax ROA and after-tax ROA. Additionally, the level of NPLR is statistically insignificant to the bank profitability. It shows that the bank profitability will not depends on the changes in level of NPLR. Secondly, the bank size has a positive and significant relationship with the bank profitability which implied that the larger the bank size, the higher the bank profitability. Lastly, the ownership of banks has significant effect on the pre-tax ROA but it is not significant to after-tax ROA. It can be concluded as the origin of banks has more explanatory power to pre-tax ROA.

The researcher expected that the level of NPLR is negatively significant to the bank profitability, but the empirical findings shows that the level of credit risk will not affect the bank performance significantly. Therefore, the researcher suggested that the commercial banks in Malaysia including the local banks and the foreign banks can focus on other factors which primarily affect the bank performance. For instance, to determine whether the internal factors such as customer deposits, capital adequacy and or otherwise the external factors such as the level of GDP or inflation rates, are the determinants of bank profitability. From the perspectives of risk management, banks can also determine whether there is a significant relationship between other risk factors (such as liquidity risk, market risk or operational risk) and bank performance. However, it does not mean that managing credit risk is not important. The credit risk management is an

important aspect of managing and preventing the losses from non-performing loans or default loans, so it should be given high attention too.

In addition, the researcher concluded that the bank size is a major determinants of bank profitability. As the increase in bank size, the profitability of commercial banks will also increase. From the bar chart analysis, most of the local banks dominant in size except for AFFIN and ALLIANCE. Besides, there are several foreign banks in Malaysia gradually climb to the height as their strengths threaten the local banking industry progressively. Hence, local banks should focus on maintaining and enhancing their strengths and increasing the size of firms so that they can generate greater returns based on the large amounts of assets. On the other hand, the foreign banks should strengthen managerial capabilities, therefore the banks can form a larger scale in Malaysia.

### **Implications of Studies**

#### ***Theoretical contributions***

The researcher managed to fill a research gap on the impact of credit risk management, bank size and the ownership of banks to the profitability of commercial banks. From a theoretical perspective, this study would help the future researchers and academicians who are interested in the determinants of the profitability of commercial banks in Malaysia or other related topics because they may use this study as a reference and it will further become the basis for the future research. Moreover, the future researcher may discover the problem or weakness about this study in explaining the effect of credit risk management, bank size and origin of banks on bank performance. Consequently, they can contribute a more comprehensive research model and thereby considered more influential factors which produce the more significant relationship.

### **Practical contributions**

For the practical contributions, this study will be very beneficial to Malaysia' commercial banking industry. This study provides the local banks and foreign banks in Malaysia would be able to understand the impact of credit risk management on the bank performance. Based on this research, the banks will able to know the bank profitability does not depends on the changes in the level of credit risk. This means that the banks with high profitability will also be exposed to high or low credit risk. Therefore, they are supposed to develop a rigor credit risk management framework to manage their non-performing loans, thereby minimizing the level of credit risk.

In addition, this study not only benefit the banks, but also will be useful to investors and regulators. The researcher found that the bank size has a positive and significant relationship the profitability of commercial bank in Malaysia. From this study, the investors can determine that the larger bank has the higher ability to generate the returns based on the large number of total assets. Moreover, from the perspectives of regulators, they can expect that the larger bank has the good performance over the smaller ones. Since the bank size has significantly affected the profitability of the Malaysian banking sector, it is the responsibility of regulatory entities to understand the banking situation and to help them (whether strong or weak) operate more effectively.

### **Limitations for the Research**

One of the limitations of this research is the data sources are limited. The researcher intends to focus on all the commercial banks in Malaysia. However, there are some foreign banks in Malaysia that are not included in this study because the researcher cannot find their annual reports from the internet or official website. Moreover, many foreign banks only provide annual reports in recent years, therefore the data used in this research is not necessarily a 10-year

time series data. Therefore, the researcher faced the difficulties in collecting the data, and it may be incurred the bias to the estimates.

Secondly, there are too fewer indicators in this study. In the multiple regression models, there only have two independent variables and one dummy variable (or indicator variable). If one of the independent variables is not significant, the whole model may readily not significant in the research. Additionally, the two dependent variables (pre-tax ROA and after-tax ROA) are too similar, therefore the regression results of the two models are likely the same when the researcher use the same predictors to analyse the model.

### Recommendations for Further Research

Under the conditions of inefficient data, the future researcher may compare the commercial banks based on the size of commercial banks to make the models more accuracy. For instance, the banks with the large scale of assets should compare with the similar ones. As the strongest and weakest bank compare at the same time may lead to inaccuracy in the model, the results of multiple regression models will not be far worse if the future researchers compare with banks based on their nature and size. In addition, the recommendations that can be done to the further research is to include more indicators. Ray. S (2015) recommends that having more data is always a good idea because it will reduce the difficulty of limited data sets. Thus, the researcher suggested that to include more indicators to test the relationship between IV and DV in the further research. At the same time, it can help the researchers to improve the accuracy of the research model with the most appropriate variables.

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