THE INFLUENCE OF SHADOW BANKING, BANK SIZE, CREDIT RISK, AND MACROECONOMICS FACTORS ON RETURN: THE CASE OF BANKS IN MALAYSIA

BY

CHAN CHI JING
H'NG SHIANG YIH
LEM RUI SEAN
LIM KAI KIANG
NG JIA YING

A final year project submitted in partial fulfillment of the requirement for the degree of

BACHELOR OF BUSINESS ADMINISTRATION (HONS) BANKING AND FINANCE

UNIVERSITI TUNKU ABDUL RAHMAN

APRIL 2019

DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

(4) The word count of this research report is 16902 words.

Name of Student:	Student ID:	Signature:
1. CHAN CHI JING	15ABB02155	_____
2. H'NG SHIANG YIH	15ABB03711	_____
3. LEM RUI SEAN	15ABB03569	_____
4. LIM KAI KIANG	15ABB05269	_____
5. NG JIA YING	15ABB06550	_____

Date: 1 April 2019

ACKNOWLEDGEMENT

We are glad that able to obtain assistance from few authorities to complete this final year project. We would like to give our highest appreciation to all of them.

First of all, we would like to thank our supervisor, Mr Hoon Hui. Without him, this project cannot be completed on time. He always guide and help us so that we can improve the quality of our research. Other than that, he encourages and motivates us when we face difficulties in completing our final year project. His friendly advice enables us to overcome various issues arising from data analysis.

Lastly, our appreciations go to all the individuals who have helped out directly and indirectly in doing this project.

TABLE OF CONTENTS

CHAPTER 2 LITERATURE REVIEW

CHAPTER 3: METHODOLOGY

List of Table

List of Figures

List of Abbreviations

BNM	Bank Negara Malaysia
BS	Bank Size
CLT	Central Limit Theorem
CPI	Consumer Price Index
CR	Credit Risk
E-View	Electronic View
FDI	Foreign Direct Investment
FEM	Fixed Effect Model
GDP Growth	Gross Domestic Product Growth
GMM	Generalized Method of Momentum
i	Cross-Sectional
IMF	International Monetary Funds
INF	Inflation
JB Test	Jarque-Bera Test
NIM	Net Interest Margin
NPL	Non-performing Loan
Pooled OLS Model	Pooled Ordinary Least Square Model
ROA	Return of Assets
ROE	Return on Equity
SB	Shadow Banking
SSA	Sub-Saharan Africa
t	Time-series

List of Appendices

DEDICATION

First of all, we would like to dedicate to our research paper's supervisor, Mr. Hoon Hui, who have guided and supported us throughout the process of completing this research paper.

Furthermore, thanks for his sincere and patient in advising us and guiding us to the correct path.

In addition, we would like to dedicate this successful research paper to our parents and friends as an appreciation to them in giving support to us throughout the whole process in completing this research paper.

Last but not least, we would like to dedicate to the future researchers whose have interest to carry out further research and study on this title. We hope that this research paper will help them in the future.

PREFACE

This research project is submitted as partly to fulfil the requirement of the course of Bachelor of Business Administration (HONS) Banking and Finance, we having Mr Hoon Hui as the project supervisor. The topic chosen was "The Influence of Shadow Banking, Bank Size, Credit Risk, and Macroeconomics Factors on Return: The Case of Banks in Malaysia". This project was written solely by the authors with supporting facts from research by others which are quoted with reference.

This topic was chosen as we found that there was less researches studied on the bank profitability. The Malaysian banking system is developing rapidly and has been acted as one of the critical driving forces of economy growth of the country. Increasing competition among commercial banks have drew the intention of conducting this research in order to have a deeper understanding on the determinants of profitability of commercial banks in Malaysia. Thus, they might be more beneficial and successful in the future.

This research was considered a success as this research could give contribution to the future studies on bank profitability. In this research, the determinants of bank profitability have been categorized into bank-specific determinants (internal factor) and macroeconomic determinants (external factor). The bank-specific determinants are shadow banking, credit risk and bank size. Whereas macroeconomic determinants are inflation and gross domestic product. The research could allow future researchers to have better understanding about the determinants of bank profitability in the future.

ABSTRACT

The aim of this research was to examine the factors on bank profitability in all Malaysian commercial banks over the study periods between 2003 and 2017. The selected bank-specific determinants are shadow banking, credit risk and bank size. Whereas macroeconomic determinants are inflation and gross domestic product. Fixed Effect Model (FEM) and Ordinary Least Square (OLS) were used in this research to determine the significance relationship among the bank profitability and independent variables. The empirical results concluded that credit risk, gross domestic product and shadow banking had statistically significant positive influence on bank profitability whereas bank size had found out a significant negative impact on bank profitability. However, inflation has no relationship with the bank profitability.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

In first chapter, 8 sessions will discussed in order to deliver a basic overview about the purpose of this research. Starting from the huge picture narrowing down into the field of this research. First of all, macro and micro view and trend of bank profitability of Malaysian commercial banking sector will be identified in background of study to know how it works in Malaysia. Following are the problem identification and research questions to address the main research problems, and 3 sessions which starting from research objectives, general objectives to specific objectives about why this research is being undertaken. Consequently, research scope and significance of findings is formulated to identify the newness of this research and what is the general contribution made by this research. Lastly, conclusion will be taken into account as a summarization for Chapter 1 and as a connection to Chapter 2.

1.1 Research Background

The study of the factors that influence on bank's return in Malaysia is always a popular topic to examine and investigate by the researchers. Banks play a very important role and responsibility as act a financial intermediary in order to provide fund to borrower and from lender in Malaysia and around the world (Zolkifli, Uda & Janor, 2018). It is necessary to have a high and stable profitability in banking system in a country due to high profitability of the banking system indicates that a

good financial stability of the economic and financial system in a country. It is because high profit of a bank means that the bank has provided many loans to their customers, so they gain more profit by charging interest to the borrower. Providing more loans will definitely increase the growth of the economy and financial development of Malaysia (Minghui & Xin'ge, 2018).

History of Banking System in Malaysia

During 1900s, Malaysian economy has promptly developed and growth due to the rubber plantation and tin industry were developed quickly (San & Heng, 2013). Thus, encouraged the formation of banking system. The banking system has steadily growing that created the need to establish BNM in order to supervise and control the banking activities. The commodity shock in 1985 and Asian financial crisis in 1997 had significantly damaged and influenced the bank profitability in Malaysian banking system. Therefore, BNM restructured and consolidated the financial institutions in 2003. Table 1.1 below showed that Malaysia has total 8 domestic banks and 19 foreign banks in 2017 (BNM, 2017).

Table 1.1 List of Local Banks and Foreign Banks in Malaysia

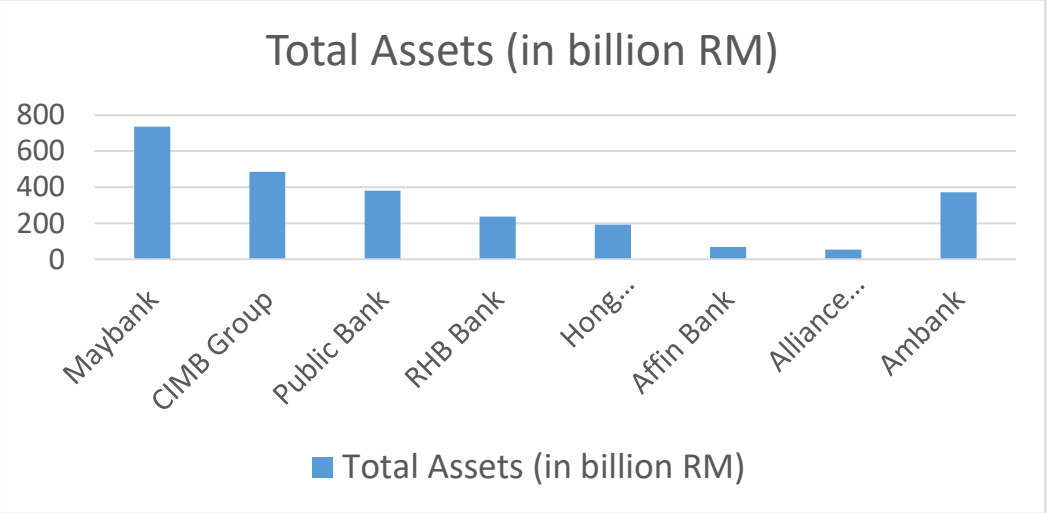
	Commercial Banks		Foreign Banks
1	Affin Bank Berhad	1	BNP Paribas Malaysia Berhad
2	Alliance Bank Malaysia Berhad	2	Bangkok Bank Berhad
3	AmBank (M) Berhad	3	Bank of America Malaysia Berhad
4	CIMB Bank Berhad	4	Bank of China (Malaysia) Berhad
5	Hong Leong Bank Berhad	5	Bank of Tokyo-Mitsubishi UFJ (Malaysia) Berhad
6	Malayan Banking Berhad	6	China Construction Bank (Malaysia) Berhad
7	Public Bank Berhad	7	Citibank Berhad
8	RHB Bank Berhad	8	Deutsche Bank (Malaysia) Berhad
		9	HSBC Bank Malaysia Berhad
		10	India International Bank (Malaysia) Berhad

11	Industrial and Commercial Bank of China (Malaysia) Berhad
12	J.P. Morgan Chase Bank Berhad
13	Mizuho Bank (Malaysia) Berhad
14	National Bank of Abu Dhabi Malaysia Berhad
15	OCBC Bank (Malaysia) Berhad
16	Standard Chartered Bank Malaysia Berhad
17	Sumitomo Mitsui Banking Corporation Malaysia Berhad
18	The Bank of Nova Scotia Berhad
19	United Overseas Bank (Malaysia) Bhd.

Source: Bank Negara Malaysia, 2017

Fundamentally, the banking system in Malaysia are divided into commercials banks, Islamic banks and investment banks. Commercial banks are the major and most important fund provider since they are the leading players in banking system in Malaysia. They have nearly RM2, 450 trillion in total assets in 2017 and it indicates that they are the largest banks between Islamic banks and investment banks (The Statistics Portal, 2017). Therefore, the commercial banks have been used in this study to examine the factors on bank profitability.

Table 1.2 Total Assets of Commercial Banks in Malaysia

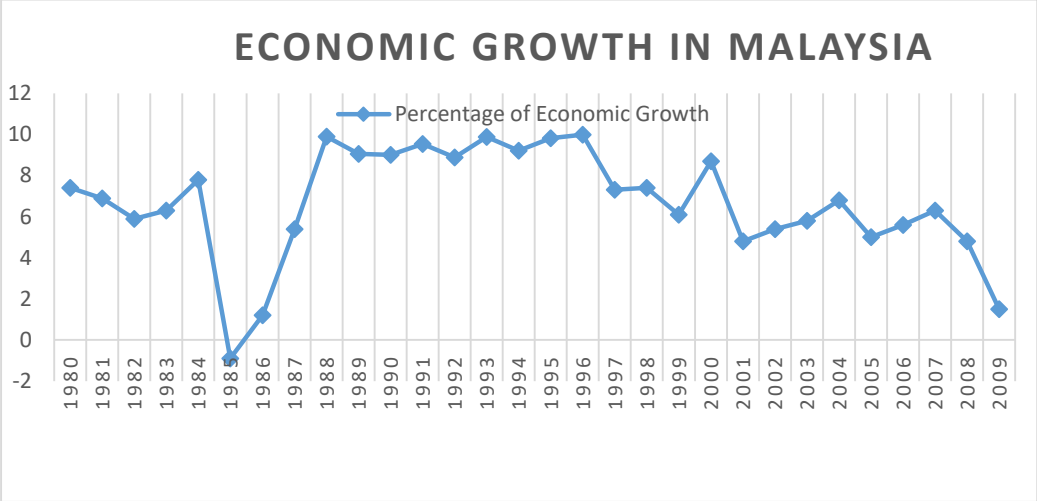


Source: The Statistics Portal, 2017

Financial Crisis in year 1985, 1997, 2007 and 2008

A poor performance of banking system lead to the financial crisis for any financial system in any country. Based on the table 1.3, in year between 1988 and 1996, the economic and financial development had experienced a rapid growth in Malaysia with the average growth rate of 9% (BNM, 2014). But in year 1985, 1997, 2007 and 2008, Malaysia had suffered from several financial crisis in these four years and lead to a low economic growth thus damaged the banking system, especially in 1985, the economic growth has dropped to -0.9% and in 2009, has declined to 1.5%.

Table 1.3 Average Economic Growth in Malaysia between 1980 and 2008



Source: The World Bank, 2017

Commodity Shock in 1985

There was an economic downturn in year 1985 in Malaysia due to the economic depression of property market in United States. It had damaged the profitability of the banking system of Malaysia due to the export price index of Malaysia has experienced a dramatic declined by 30% in palm oil and tin prices in 1984 until 1986. In 1989, Malaysian economy had returned due to the export-oriented Japanese companies have invested production factory in Malaysia due to Malaysian low wages, low political risk and more quality facility (Yang, Kolari, & Min, 2003). It had led to high net FDI inflows and encouraged economic growth in Malaysia.

Asian Financial Crisis in 1997

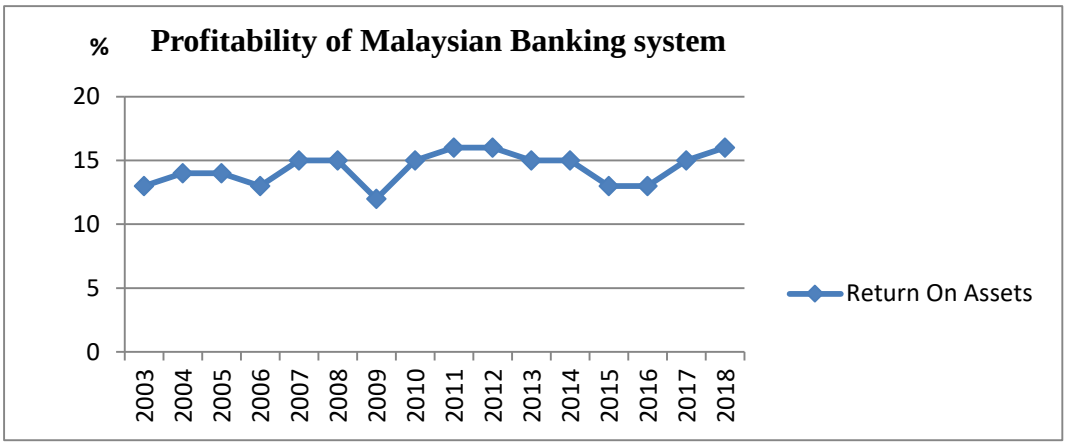
In July 1997, the financial disaster began in Thailand due to Thai bath depreciated. Many Asian countries, especially Malaysian economy and their banking system has affected and collapsed significantly (Khoon, & Lim, 2010). Malaysian government had restructured banking and financial system and also was helped by the International Monetary Funds (IMF). The roles of IMF is to provide financial aid and bailout to the financial crisis-affected countries to avoid

credit default and bankruptcy of the banks. It was because many foreign investors withdrew their credit from the crisis nation to protect their money. Due to the less lender provided credit to the bank, the borrower was unable to borrow money from the bank. It has led to many economic issues such as high unemployment and low financial development in Malaysia (Ghazali & Weetman, 2016).

United States Subprime Mortgage Crisis in 2007 and Global Financial Crisis in 2008

In December 2007, the mortgage crisis in United States had contributed to the global financial crisis in 2008. Mortgage crisis was because of the property prices extended an unmaintainable level after the quick growing in the market values and after that unexpectedly experienced a large decline (Edison & Reinhart, 2015). Different nations have been influenced in a different way, according to the environment of their financial connections with other countries and also based on their financial institution's quality and economic policies. For Malaysia, the stock prices have decreased gradually by 20% within 2007 and 2009 (Sundaram, 2016). Fortunately, the fallen stock price shock was absorbed well by the financial institution in Malaysia. The actions taken and monetary policy imposed by Malaysia government helped to recover the stock price stock faster. Therefore, the global financial crisis has a slightly effect on the bank's profitability and the Malaysian economy was not much influenced by financial disaster in 2008. To see the effect of financial crisis in 2008 on the bank profitability in Malaysia, table 1.4 displays the profitability movement which is measured by return on asset. Based on the table below, it illustrated that the bank profitability movement was sustaining at a steady level between 1.3-1.5% exempt for the little decreasing to 1.2% in 2009 because of the financial disaster in global, it can be said that it only have a less influence on return on asset of banks.

Table 1.4 Profitability Movement of Malaysian Banking System between 2003 and 2018



Source: Bank Negara Malaysia, 2018

Movement of Macroeconomic Variable

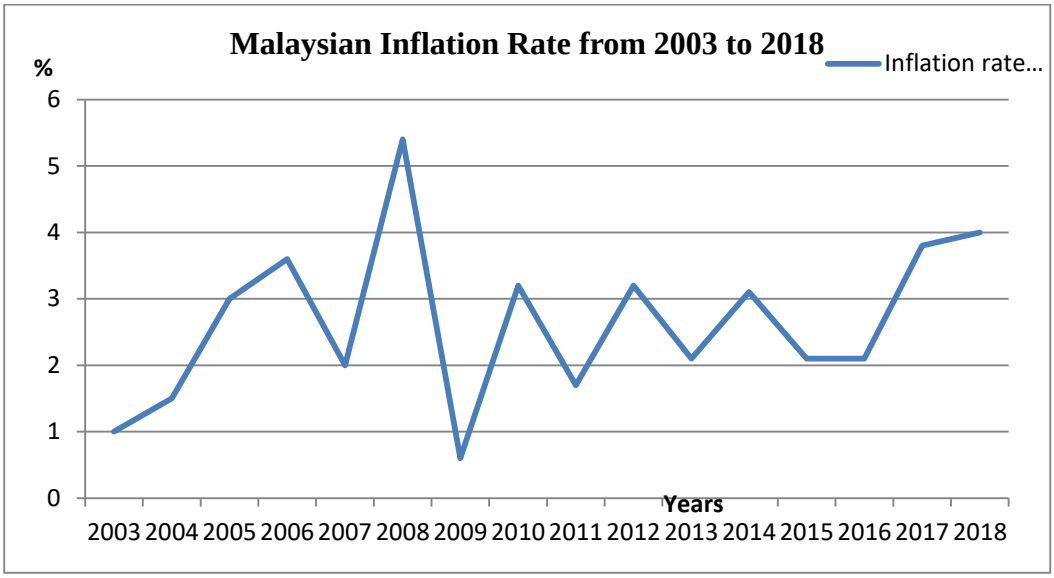
To illustrate the effect of financial disaster on annual Gross Domestic Product (GDP) growth, table 1.5 shows the movement of the annual GDP growth between 2003 and 2018. Based on the diagram below, the trend showed that the global financial crisis influenced the Malaysian GDP growth declined to negative in 2009, from 3.3% in 2008 to -2.5%. Then, the growth rate started to increase in 2010.

Table 1.5 Average Annual GDP Growth from 2003 to 2018 in Malaysia

Source: World Bank Data, 2018

To have a clear picture about the inflation rate towards the global financial crisis in 2008, table 1.6 below displays the annual average inflation rate within 2003 to 2018 in Malaysia. The inflation rate is calculated by the consumer price index (CPI). Based on the diagram, it illustrated that the inflation rate dropped dramatically to 0.6% in 2009 from 5.4% in 2008 due to the financial disaster. From 2010 to 2017, the inflation rate was constant and under the world-wide inflation rate, especially for the inflation rate of 2017, it was increased to 3.8%.

Table 1.6 Average Annual Inflation Rate within 2003 to 2018 in Malaysia



Source: World Bank Data, 2018

The gap of this study is shadow banking because it has risen in securitization of assets and the combination of banking activities after the financial crisis in 2008. The function of shadow banking is to carry out basic banking activities and relocate traditional credit activities into security activities (Adrian and Ashcraft, 2015; Gennaioli, 2015; Metrick, 2014). Based on Adrian and Shin (2013), they defined that traditional bank that provide loan and keep deposit from their customer, also act as security dealer and shadow banks. Commercial banks started to collect pools of loan and sell them as securities in order to minimize the risk of keeping customer loan. Moreover, banks can earn servicing fees by providing various shadow banking services. According to Al-Awawdeh and Al-Sakini (2017), they stated that the banks and non-bank financial intermediaries have no clear distinction because different methods has been implemented in describing the non-bank financial intermediaries in Malaysia. Due to the revenue of shadow banking activities are involved net fees and commission, the shadow banking is measured by the net fees and commissions divided by total revenue (Tang and Wang, 2015).

In conclusion, this study is examined to explore the gap and determinations on bank profitability of all eight local commercial banks in Malaysia during 2003-2017. To maintain and stable the health of banking system, it is necessary to examine the internal and external factors on the bank profitability, therefore BNM and banks can take an advantage to rise their profit by controlling the important factors.

1.2 Problem Statement

Malaysia views banking system as the most significant players to improve economy and financial development. The economy condition of a country is highly connected with the health of the banking system. Therefore, if banks do not have enough profit to provide funds to numerous industries, the economy and financial development will not develop and grow (Athanasoglou, Brissimis, & Delis, 2015). A poorer performance of financial institution for any country is easy leading to a financial crisis for any financial system. It is because the lower bank profitability will increase the probability of bank failure and also decrease the economic growth and development. The issues of bank failure can be seen as a very critical problem in Malaysia and also around the world. Since bank failure will lead to many significant economic issues for any country. Therefore, acquire a strong banking system in a country is comparatively critical so the study on factors of bank profitability is very essential to the country. So there is enormous of literature review studying the bank profitability in Western countries and fewer study done by researchers in Asian country. Also from the period of 2003 to 2017, there is less researcher done the research of bank-characteristic factors and macroeconomic factors on bank profitability, so it can bring to a new trend of bank bankruptcy (Demirgüç-Kunt & Huizinga, 2015). Therefore, this study investigates the factors of Malaysian commercial banks' profitability from 2003-2017.

Malaysian banking system experienced enormous structural changes due to the financial disaster in 1985, 1997 and 2008. Today, the worldwide economy is not completely recovered from these financial crisis and still suffering. The financial disaster in 1985 and 1997, Malaysian banking system has suffered from it and it has led the BNM to change the structure of the financial institutions in 2003 to strengthen the banking system. However, the profitability movement of Malaysian banks can be seen as stable and strong because it did not have much influenced by the financial crisis in 2008. It was because the financial intuitions were able to response quickly towards the fallen stock price. So, the banking system in Malaysia plays a very significant role to avoid the country from suffering the global financial crisis. Since Malaysia economy was less affected by the financial crisis in 2008, we use two models which are Pooled OLS model and Fixed Effect model to compute data in this study as we assume there is no time effect of financial crisis during 2003-2017 in bank profitability in Malaysia. It indicates that the factors that used to investigate in this study will not be influenced by the financial disaster.

Malaysia has a very low GDP growth rate which is -2.5% in 2009 due to the financial crisis in 2008. A low GDP growth rate indicates that the banks are unable to have enough fund to lend to their customer so unable to foster the financial development and economic growth in the country (Tan & Floros, 2014). Therefore, low GDP growth has led to a low bank profitability. Therefore, enhancement of GDP growth lead to a higher bank profitability because banks have more retained earnings so definitely have more money to provide loan to the borrowers. By implementing fiscal and monetary policy, the growth rate started to increase at the beginning of 2009. Besides that, Malaysian inflation rate has a huge declined to 0.6% in 2009 because the economy situation around the world in June 2008, brought to a fragile international demand and led to a significantly decrease of worldwide commodity value, mainly crude oil values. The movement between bank profitability and inflation showed it has a positive relationship, low inflation has led to a low bank return in 2009. Through the efforts made by financial institutions in following the implementation that imposed by BNM, the Malaysian inflation rate started to increase in 2010. It can be concluded that

having a good and strong banking system is very essential for a country to avoid country economic disturbed from financial disaster (Anbar & Alper, 2011). The bank in Malaysia, regardless local banks or foreign banks is required to follow some restrictions implemented by BNM to strengthen the country banking system in order to increase the country GDP growth rate and inflation rate. Malaysian financial institution can be seen to be well prepared and take full responsibility for stabilizing the banking system.

Moreover, based on the previous literature reviews proved that the internal factors such as credit risk, bank size and external factors such as GDP growth and inflation will influence significantly towards bank profitability. Therefore, we re-investigate these factors that proposed by previous research because the determinants of bank profitability will be different in different country. There is an ongoing debate about optimal bank size after the financial crisis 2008. On the one hand, some institutions claimed to be larger than absolute size, but on the other, a need to grow larger in order to achieve higher profitability. Rahim (2015) reveals that the Malaysia bank size is not large enough to capture the advantages of economies of scale, while it is difficult for the large banks to achieve efficient in scale. It has been argued that the large banks result in lower bank profitability because of higher start-up costs, research and development costs and political costs are involved. On the contrary, Adusei (2015) claimed that the large banks take advantage of economies of scale and lead to an increment in profitability. Therefore, this study aims to understand the relevance of the profitability and the size of commercial banks in Malaysia.

Poor credits was claimed to be the major cause of bank failure in the world's banking crisis (Saeed and Zahid, 2016). To capture the lessons learned from the financial crisis of 2008, there is a need to pay particular attention in improving credit risk management system to optimize profitability (Trofimov et al., 2018). Credit risk poses a serious threat to the bank profitability as the commercial banks' major source of income is derived from granting credit. Sufian (2009) investigated domestic and foreign commercial banks in Malaysia during the

period of 2000-2004. The findings suggest that credit risk has negative impact on bank profitability. Therefore, it is crucial to understand the extent to which the credit risk affect the Malaysia commercial bank profitability.

Combey and Togbenou (2017) stated that bank's profit increases as the GDP growth rate increases in the period of economic upswing and profit declines during the economic slowdown. GDP growth is expected to have a positive impact on bank profitability. An increase in GDP growth rate causes an increase in bank deposits and loans that would boost bank's net interest income and reduce loan losses, in turn increase bank profitability. On the other hand, lower GDP growth rate may incur a higher cost in collecting the loan during the unfavorable economic conditions (Bolt et al., 2012). As Malaysia GDP growth rate has always been showing an upward trend, so this study examine the effect of GDP growth on the profitability of the Malaysian banks.

Inflation causing the world markets less competitive and also generally weaken nearly all kinds of economic activities, especially for banking activities, as it would reduce the gain from investment. Also, inflation has an adverse effect of eroding customers' purchasing power but it is not a critical issue as the bank normally dealing financial instruments with reference to maturity and interest rate. The bank is still able to resist the impact of inflation over the short run. However, they are unable to withstand the impact of inflation in the long run where the inflation grows (Umar et al., 2014). On the other hand, inflation can also have positive effect on the bank profitability as if the bank able to foresee future inflation rate. Potential to realize higher profit by adjusting the rate of interest. Hence, this study seeks to identify the actual impact of inflation on Malaysian bank profitability.

The shadow banking as the gap of this research have been discussed less in numerous literature studies about this topic. According to the diversification concept, it can be said that carrying out shadow banking and traditional banking

services minimize the risk and lead to rise the bank profitability at the same time. However, Calmes and Liu (2015) stated that the shadow banking activities are unstable to increase bank profit due to the fluctuation. Moreover, Karim, Abd and Gee (2015) indicate that there is no relationship between shadow banking and bank profitability because there is less connection between ROA ratio and non-interest revenue.

1.3 Research Questions

In order to gain an insight and understanding regarding the determinants of bank profitability in case of domestic commercial banks in Malaysia, some of the questions are carried on as below:

i. Whether there is a significant relationship between bank size and bank profitability in domestic commercial banks of Malaysia?
ii. Whether there is a significant relationship between credit risk and bank profitability in domestic commercial banks of Malaysia?
iii. Whether there is a significant relationship between GDP growth and bank profitability in domestic commercial banks of Malaysia?
iv. Whether there is a significant relationship between inflation and bank's profitability in domestic commercial banks of Malaysia?
v. Whether there is a significant relationship between shadow banking and bank profitability in domestic commercial bank of Malaysia?

1.4 Research Objectives

Research objectives identify as the purposes and goals of this research and it should be reached at the end of this research. There are two types of research objectives which includes general and specific objectives as listed below in this research.

1.4.1 General Objective

The general objective is to examine the impact of bank size, credit risk, GDP growth, inflation and shadow banking on bank profitability in domestic commercial banks of Malaysia.

1.4.2 Specific Objectives

i. To investigate the significant relationship between bank size and bank profitability in domestic commercial banks of Malaysia.
ii. To investigate the significant relationship between credit risk and bank profitability in domestic commercial banks of Malaysia.
iii. To investigate the significant relationship between GDP growth and bank profitability in domestic commercial banks of Malaysia.
iv. To investigate the significant relationship between inflation and bank profitability in domestic commercial banks of Malaysia.

v. To investigate the significant relationship between shadow banking and bank profitability in domestic commercial banks of Malaysia.

1.5 Hypothesis of Study

1.5.1 Bank Size

H_0 : There is no significant relationship between bank size and bank profitability.

H_1 : There is a significant relationship between bank size and bank profitability.

1.5.2 Credit Risk

H_0 : There is no significant relationship between credit risk and bank profitability.

H_1 : There is a significant relationship between credit risk and bank profitability.

1.5.3 GDP Growth

H_0 : There is no significant relationship between GDP growth and bank profitability.

H_1 : There is a significant relationship between GDP growth and bank profitability.

1.5.4 Inflation

H_0 : There is no significant relationship between inflation and bank profitability.

H_1 : There is a significant relationship between inflation and bank profitability.

1.5.5 Shadow Banking

H_0 : There is no significant relationship between shadow banking and bank profitability.

H_1 : There is a significant relationship between shadow banking and bank profitability.

1.6 Scope of Study

This research merely focus on the impact of macroeconomic and bank-specific factors on domestic bank profitability in Malaysia. The factors of bank-specific includes bank size, credit risk and shadow banking; whereas inflation and GDP growth will be applied as macroeconomics variables. It is important to determine the direct relationship between these factors and bank profitability to ensure the stability of economic growth in a country. The application of panel data in this research have a total 120 observations which is derived from 8 commercial banks in Malaysia and 15-year study periods, from 2003 to 2017. The banks which have been carried out in this research are Public Bank, Maybank, Hong Leong Bank, CIMB Bank, AmBank, RHB Bank, Affin Bank and Alliance Bank Malaysia. Country analysis has been carried out in the developed country which is in Malaysia.

1.7 Significance of Study

From this research, we can understand and gain knowledge about the relationship between our independent variables which are (1) bank size, (2) credit risk, (3) GDP growth, (4) inflation and (5) shadow banking and our dependent variable which is return on asset of all banks in Malaysia between 2003 and 2017. Our newness is adding the shadow banking as one of our independent variable that effect bank profitability. It is because less banking and finance researchers do not considered that the shadow banking business affect the return of the bank in Malaysia. However, the trend of shadow banking business has increased and expand recent years in Malaysia, so it becomes our gap in this study.

This study benefits internally and externally as it gives a clear direction to boost bank profit. The independent variables we have been used in this research, some are macroeconomic variables which are GDP growth and inflation, indicating these two explanatory variables can influence the country's economy significantly and lead to impact the bank profitability. Apart from the impact to the economy and bank profitability, this study also give a better understanding and knowledge to the related parties and industries, for examples, Bank Negara Malaysia, Bursa Malaysia, government, regulators and also investors. They are able to make a better and precise decision in order to increase bank return in the future to obtain a greater advantage.

Moreover, the policy makers and government such as BNM can construct suitable policies to strengthen and stable the bank's profitability in the long run. Furthermore, BNM can regulate and adjust the performance of the banks to develop and increase their profit growth level. It is because we have included some important bank-characteristic variables such as bank size, credit risk and shadow banking and also macroeconomic variables like GDP growth and inflation. BNM and the Malaysian government can affect the Malaysia's banking system environment through the monetary policy and fiscal policy.

In short, by conducting this study, we will reveal whether the bank size, credit risk, GDP growth, inflation and shadow banking have an impact in influencing the banks' return in Malaysia and therefore, the appropriate policies can be implemented in order to enhance bank profitability growth in Malaysia.

1.8 Chapter Layout

The first chapter of this study is introducing the profitability trend of Malaysian banking sector through research background. It provides the basic outline of this

research through problem statement, research questions, research objectives, research hypothesis, research significance and scope of the study.

The second chapter of this study will further investigate this study topic through theoretical and literature review for all chosen variables to examine the significance or insignificance relationship between bank profitability. It contains theoretical and conceptual framework in this chapter.

The third chapter of this study is mainly focus on research methodology. This chapter covers research design, collection and processing of data and also the methods and tests to use for accurate data analysis following by conclusion.

The fourth chapter in this study will be presenting the findings and discussion of the results obtained in previous chapter. It consists of interpretation and analysis of different diagnosis tests.

The last chapter is this study will be cover major findings of all variables. Next, implementations of policies will be suggested based on the final result. Limitations of this study will also be revealed provided with several recommendations to relevant parties within Malaysia context for future studies.

1.9 Conclusion

As a summarization, this chapter provides a basic insight about the outline of this research through research background, problem statement, research questions, research objectives, research hypothesis, research significance and scope of the

study. Research background contains profitability trend of Malaysian banking sector, GDP growth rate, and inflation rate and structure of Malaysia banking system to build up the concept of this research. Problem statement contains the mixed result that explored by previous researchers in details to become an inspiration to discover this research topic. The remaining sessions will be taken as a fundamental for readers about the main purpose of carrying out this topic. Following chapter will further investigate this research topic through theoretical and literature review for each relevant variable to examine the significance or insignificance relationship between bank profitability.

CHAPTER 2 LITERATURE REVIEW

2.0 Introduction

In this chapter, it gives a review on the purpose to understand the determinants of bank profitability in Malaysia. In the process of the study, past literature research related to bank profitability and the factors has been reviewed. This study will be focused on the bank size, credit risk, GDP growth, inflation and shadow banking. This research examine the determinants of bank profitability in Malaysia from 2003 to 2017 for eight domestic commercial banks. Furthermore, the relationships between the bank profitability and its determinants are being studied as well as the new framework is formulated in this chapter.

2.1 Theoretical Review

2.1.1 Financial Innovation Theory

For financial innovation theory, shadow banking function as the form of financial innovation, can reduce the taxes and transaction costs and hence increase return (Schwarcz, 2012). A view from Chinese scholar Ba (2012) said that shadow banking as the form of financial innovation, using bypassing regulation and information to earn higher profit. For instance,

shadow banking will conduct adverse selection for the information asymmetry between the banks and fund providers in order to maximize its profit. In addition, shadow banking has a benefit of bypassing the regulation which can enhance the return of banks by approaching to extra loan resources. Furthermore, shadow banking as financial innovation can increase their fund resources by converting the illiquid asset to liquid asset and hence improve the profits for banks (Tang & Wang, 2016).

On the other hand, since the return is higher and the demand will be more sophisticated, innovation attracts the clients who are more strategic to demand the shadow banking services. Hence, the higher the income gain from shadow banking, the higher the return and risk-adjusted return and thus the higher the bank profitability (Tang & Wang, 2016).

2.2 Literature Review

2.2.1 Return on Assets (ROA)

Bank profitability is the net earnings or the net after-tax income of a bank and it can be measured by various ways. Financial ratios are the most common used methods to measure bank profitability performance as it helps to clarify and evaluate the bank data and accounting information. In addition, the most important reason of using financial ratios methods is because it can be served as the benchmark for different sized of commercial banks for comparison purpose. Therefore, the individual bank ratio can be compared with others banks with their industry average (Ong and Teh, 2013).

Based on the previous studies, the most general used indicator of financial ratios methods to measure bank profitability are Return on Assets (ROA) and Return on Equity (ROE). In this study, ROA is used as the indicator to calculate the bank profitability as it is supported by few previous studies such as Vejzagic and Zarafat (2014), Petria, Capraru and Ihnatov (2015) and Sheefeni (2015). ROA is defined as the comprehensive financial ratio which used to measure the overall performance of the domestic commercial banks. The measurement of ROA is total income divided by total assets of banks. ROA can help to indicate the efficiency of bank management by taking into account the amount of management able to generate income from the assets. Higher ROA is more preferable as it proved that the management is able to utilize the assets to gain high profits and thus the bank profitability is in good performance (Mbekomize & Mapharing, 2017).

On the other hand, ROE is not been used as the indicator for this study because it only takes into account the profitability from shareholder's perspective. For instance, it only shows how effectively the bank management in handling the shareholders' funds to generate the revenue for them which is mostly take advantage from the capital investment of bank. Whereas NIM is only calculate the asset quality of the banks since this indicator is measured by the net interest profit over the total assets. In contrast, ROA is the best indicator to measure the bank profitability performance as it takes into account the leverage risk which play an important role in bank profitability ratio. There is one drawback for ROA which is the existence of the off-balance-sheet activities may misleading the result of the model (Petria, Capraru, Ihnatov, 2015).

In nutshell, ROA had been chosen as the indicator to measure the commercial bank profitability performance in this study.

2.2.2 Bank Size

Bank size is termed bank specific factor on bank profitability. Studies has been conducted in an attempt to explore whether bank profitability is maximized due to the factor of bank size. Based on past research in finance, bank's total assets is deployed as proxy to measure bank size. According to the researches done by Mbekomize and Mapharing (2017); Tariq et al (2014); Ally (2014); Saeed (2014), the relationship that is positively and significantly affecting bank profitability. Mbekomize and Mapharing (2017) conducted their empirical analysis applying Ordinary Least Square regression model on a total of 64 observations covering period from July 2011 until October 2016, investigating the relationship of size-profitability in Botswana. The findings suggest that bank size has positive and significant relationship with bank profitability. Besides, Tariq et al (2014) employed the techniques of polled regression, fixed and random effect estimator to test the influence of bank determinants, over the period 2004-2010, on the 17 commercial bank profitability in Pakistan. The results showed a significant positive relationship as large banks are more profitable in terms of the amount of deposits compared to banks that are smaller in size. The same is reaffirmed by Saeed (2014) studied the determinants on bank profitability in United Kingdom over the period 2006-2012 by conducting regression and correlation analyses on 73 commercial banks. Results revealed a significant positive relationship exists between size-profitability where expanding operations could drive profits to banks as the shareholder's equity increases. Moreover, the same technique of fixed effect estimation employed by Ally (2014) on the panel data of the 23 banks in Tanzania for the years from 2009 up to 2013. The authors pointed out that the asset size is consistent with the concept of economies of scale and the results was in line with the study done by Tariq et al (2014).

In contrary, some researchers found that bank size variable significant and negatively influences the bank profitability (Aladwan, 2015; Almazari, 2014). Aladwan (2015) using two-sample t-test in measuring the influence of bank size on Jordanian listed commercial banks' profitability over the period of 2007 to 2012. The findings indicate a negative relationship between two variables as when the bank's assets decreasing in size. Almazari (2014) studied banks profitability on 23 banks in Saudi and Jordanian across wide range of investigation of 2005-2011, to learn the differences and similarities with regression analysis and descriptive analysis of variance. The result is in line with Aladwan (2015), size of bank has a negative and significant impact on bank profitability. The growing bank has declining average profits where by the diseconomies of scale occurs.

Others, such as Dawood (2014) used ordinary least square (OLS) method to analyse 23 commercial banks' profitability in Pakistan from 2009 to 2012. Results revealed size of the bank had an insignificant positive impact on bank profitability. The bank size does not contribute to the profitability of the commercial banks in Pakistan. Also, Samad (2015) confirmed an insignificant positive relationship between size-profitability by employing same method that is Panel Ordinary least square (OLS) with panel data for the period 2009-2011 to Bangladesh banking industry.

2.2.3 Credit Risk

Credit risk can be defined as possibility of a bank creditor or borrower unable to fulfill their debt obligations within a predetermined deadline that might push bank into case of insolvency. There are several proxies supported by previous researchers in measuring credit risk. The work by

Isanzu (2017) used four indicators, which are non-performing loans, capital adequacy ratio, loan impairment charges and impaired loan reserve respectively to measure credit risk impact on Chinese bank's performance. The paper by Menicucci & Paolucci (2016) used asset quality ratio, derived from loan loss provisions / total loans to measure the credit risk impact in the case of European banks. A high ratio of credit risk indicates lower bank profitability because incapability in maintaining credit quality. Meanwhile, the paper by Ebenezer & Omar (2016) used debt / asset ratio, debt / equity ratio and non-performing loans ratio as proxies of credit risk in his research conduct on commercial banks in Nigeria, reasons of using debt/ equity ratio is because of it can reveals how much revenue that firm earned compare to total number of shareholders equity found from their balance sheet.

To reflect the positively significantly relationship of credit risk towards bank profitability, Alshatti (2015) employed credit risk management indicators (Non-performing loans/Total loans, Provision for facilities loss/Net facilities, leverage ratio) measured by return on asset (ROA) and return on equity (ROE) from Jordanian commercial banks. The result implies that the higher the cost used to make provision for the bad loans, the higher the profitability. The study by Saeed and Zahid (2016) considered impairments and non-performing loans as the two variables impact on ROA and ROE conducted in UK agreed the result of positive and significant. This means that UK banks can still benefiting from interest rates, commissions even they are underlying credit risk from 2008 credit crisis. The same findings was supported by Kutum (2017) that used non-performing loans/ total gross loans as measured by ROA within five banks listed on Palestine Exchange. The author concluded that although credit risk is often seen as a negative impact to bank stability, but it improves profitability by allowing bank to charge higher interest rates to take on risk. Moreover, banks announced to provide more preferential credit for small and medium-sized enterprises after undertaking risky projects can

encourage bank growth, as the further support of higher credit risk to higher ROA (Panta, 2018).

On the other hand, recent studies (Poudel, 2018; Noman, Pervin, Chowdhury, & Banna, 2015) that covered under Nepal and Bangladesh claimed that credit risk will bring negative significant impact to the bank financial achievement. NPL ratio as the proxy and Fixed Effect Model (FEM) as the major tool for data analysis in the case of Nepal whereas all credit risk indicators has a negative significant effect on NIM, ROA and ROE in the case of Bangladesh by using unbalanced panel data. Olalekan, Olumide, and Irom (2018) highlighted the consistent findings on studied banks in Nigeria banking performance by using NPL/ total loan to ROA. From the multiple regression result, it showed that every 1% increase in credit risk will led to 29% of bank profitability to deteriorate. Together with Muriithi, Waweru, and Muturi (2016) and Menicucci & Paolucci (2016), the authors supported the same significant negative result of credit risk on Kenyan (2005 to 2014) and European (2006 to 2015) bank profitability respectively. This result implies that the higher bank's credit risk exposure resulted poor asset quality, hence lower the bank profitability, vice versa.

In other result, a negative and insignificant result were emphasized by Veizi, Mano, and Kociu (2016) by using NPL ratio as credit risk indicator to both return on equity (ROE) and return on asset (ROA) conducted as profitability indicators in the case for 16 Albania's commercial banks from 2008 to 2015. The insignificant result indicated that NPL ratio was not suitable to consider as influencing factor towards bank profitability. The similar findings followed by Duraj and Moci (2015), by using same measurement of credit risk with the former to determine the impact on bank profitability in Albania. The results from multi regression model show that credit risk has no significant effect on bank financial performance. The reason is because the decline in the amount of credits in

the economy recent years, combined with increase deposits, has led to high liquidity, and the impact of credit risk had been offset.

In the conclusion, lower credit risk brings higher profit and lower volatility for banks because it represents a strong and stable growth. Therefore, a better grasp and management on credit risk and loan facilities regulation will contribute to the better operation and circulation to banking system (Ekinci, 2016). It is also undeniable that a good monetary policy and lower non-performing loan will bring better financial performance. However, this conclusion obtained relies on various case of covered countries economy and cannot be generalized universally to all countries bank determinants.

2.2.4 Gross Domestic Product (GDP) Growth

Gross Domestic Product (GDP) is a macroeconomic indicator that measure the bank profitability for most of the previous studies. GDP is used to indicate the economic growth of a country by taking into account the income generated by production and output. According to Ong and Teh (2013), the state of economic cycle is reflected by GDP. For any country, the impact of GDP growth rate on the bank's profitability is depend on the economic conditions in that country. Besides, GDP is predicted to have a direct impact on the customer's demand and supply of deposits and bank loans that lead to change in the profit level and cash flows for domestic commercial banks during favourable or unfavourable economic condition (Obamuyi, 2013). Hence, the bank can earn higher profit when the business opportunities in economy increase during economic booms due to the higher GDP. This explained that when the business opportunity increases, the demand of credits will increase, therefore enhanced the

lending activities of the bank. On the other hand, the demand of credits will reduce whereas nonperforming loan will increase when the GDP growth slows down during economic recession in a country as result of the nature of business cycle. In consequences, the bank profitability will decrease since the demand of loan reduced and increase of nonperforming loan for certain banks (Ong & Teh, 2013). In order to determine the economy condition in Malaysia, annual GDP growth rate is used as a proxy measure for GDP.

Based on the previous study, some of the researcher found that GDP and bank profitability has positive and significant relationship. The positive and significant result supported by Ebenezer, Omar and Kamil (2017), who has carried out a research in Nigeria by using balanced panel data to investigate the determinant of 16 commercial banks profitability over period of 2010 to 2015. In addition, the impact of GDP is significant and positive to commercial banks profitability in Turkey for 43 periods which from January 2005 to September 2015 (Topak & Talu, 2017). It also proved by the study of Curak, Popsoki and Pepur (2015) which use the dynamic panel analysis to investigate the macroeconomic determinants of bank profitability based on 16 banks in the Macedonian banking system from 2005 to 2010. As expected, when the economic activities growth, the demand for banking service will increase and lead to improvement in bank profitability. For better understanding, when GDP is increasing, more citizen will make a loan with bank and hence the revenue of bank will increase since the interest of loan is the profit for the bank (Curak et al, 2015). Vejzagic and Zarafat (2014) stated that real GDP has influenced the bank profitability significantly and positively with confidence level of 1% and 5% in their findings for seven of the commercial banks in Malaysia for the period 1995 to 2011. Based on their study, when economic growth going upward, the demand for business loans will increase, thus generate higher returns to the banks and finally enhance the profits to the commercial banks.

In contrast, some studies carry out that there has a significant negative relationship between GDP growth and bank profitability. For instance, Combey and Togbenou (2017) found that GDP affect the bank's profitability significant negatively measured by ROA during long run period from 2006 to 2015 in Togo. Based on research of Yakubu (2016), he had used the ordinary least square regression model to examine the macroeconomic factors on five commercial banks profitability over the period 2010 to 2015 in Ghana. The result show that GDP growth have a negative and insignificant sign with bank profitability in his study. This may be as a result of non-performing loan during the unfavourable economic condition, so that the banks have to write off the non-performing loans which may reduce the profit of bank. Another prove from Jodanian banks, the outcome demonstrated a negative relationship between GDP and bank's profitability (Alkhazaleh & Almsafir, 2014). Besides that, the outcome in line with the finding is carried out in 42 Sub- Saharan countries from 1999 to 2006 as banking sector need to handle the loans originate and loan losses during the GDP expansion period (Francis, 2013). The instinct is that with economic growth, barriers to entry are decreased and hence increase the number of investors from foreign country. The increasing number of investors will lead to improvement of business environment that result to higher competition in that country and finally decrease profitability.

On the other hand, the result is different with the other studies in which based on Sheefeni (2015) findings, they found that GDP growth did not have any impact on bank profitability as external environment will not influence the commercial bank's profitability in Nimibia from 2001 to 2014. In different macroeconomic environment, the distinguish of macroeconomic determinant will affect how the bank operate in a country. It also obtain the same result which GDP do not influence the bank profitability. In Nigeria, a similar study is carried out during the period 1980 to 2010, and the result show that GDP is not to be the determinant of profitability for the first bank (Ayanda, Christopher, Mudashiru, 2013).

According to Weersainghe and Perera (2013), they expected that GDP will has a positive relationship with ROA in their study, but the result show that GDP does not significantly impact the profit of banks. Lastly, Ong and Teh (2013) found that GDP do not influence bank's profitability measured by ROA in Malaysia.

2.2.5 Inflation

Inflation is the price of goods and services increase which will cause the purchasing power drop (Khan, Shahid, Bari, Anam, Shehzad & Siddique, 2014). Rabiul, Ahmad, Emil and Narmatha (2017) explained that inflation will cause the quality of the lifestyle to reduce due to people need to spend more money to purchase the same amount of goods or services than the previous bought. The proxy of the inflation is the consumer price index (CPI), which found the value of annual percentage change in Malaysia on the World Bank.

The authors which are Aaron and Floros (2012) supported that the inflation increased in 1 unit, the banks' profitability will raise at least RM 1 in China from 2003 to 2009. The authors applied the two-step Generalized Method of Momentum (GMM) to examine the Chinese banking industry. Besides that, Tariq, Usman, Mir, Aman and Ali (2014) supported that the inflation occurred is the chance to increase the interest rate in order to adjust the revenue higher than the cost. Thus, inflation happened will lead the bank's profitability increase from adjusting on the interest rate. Ali (2015) examined the positive significant relationship between inflation and ROA in Pakistan by using the panel data from 2009 to 2013. During the inflation, the bank can charge with the high-interest

rate on the loan which can covert the loss during inflation and makes the profit as well (Akin, 2016).

On the other hand, Yao, Haris and Tariq (2018) tested that the effects of variables included bank, industry and macroeconomic on banks performance in Pakistan from 2007 to 2016. It is used two-step Generalized Method of Momentum (GMM) with the 28 banks panel data. The inflation is negatively significant influence on the banks performance in Pakistan. If the high inflation with unexpected rate, it may force the costs are larger than the revenue of the bank. It will be caused by the bank performance drop when the bank need a large amount to cover the cost itself (Yao, Haris & Tariq, 2018). Umar, Maijama and Adamu (2014) found that if the inflation raise in 1 unit which may cause the banks' profitability to drop at least RM 1. It is because when the inflation rate increases will force the volume of lending decreases. The bank performance will drop due to the decreases in the volume of lending. There has the paper to examine the impact of economic factors on bank performance in Rwanda from 2010 to 2015. It used the qualitative and quantitative method to analyse the result of the negative significant relationship between inflation and bank performance. The high inflation will cause strictly on borrowing to the borrowers. Thus, the less of the loan will be provided to the public and the bank performance will go down at the same time (Khan et al., 2014; Nshimiyimana & Zubeda, 2017). Moreover, Hooshyari and Moghanloo (2015) proved that the inflation will have a negative impact on the bank's profitability because of the effect of credit market. It causes the reduction on offer the asset which is loan that would directly influence on bank's profitability.

However, there has some authors argue that there has an insignificant between inflation and bank profitability. Combey and Togbenou (2017) examined that the relationship between the macroeconomic factors and the profitability of the bank in Togo. It is applied Pool Mean Group estimator

to category into two types of relationships which are short-run and long-run between 2006 and 2015. It showed that in the long run, if the inflation increase in 1 unit, the banks' profitability would be unchanged in Togo. There has proved that the short-run would not affect any macroeconomic factors. Therefore, inflation would not affect the banks' profitability in long-run and short-run. Besides that, Scott and Ovuefeyen (2014) examined the impacts of economic openness and inflation on profitability of commercial bank in Nigeria from 2005 to 2012. It used the panel date and 14 as sample from the commercial bank in Nigeria. The result of the Hausman test proved that the inflation and bank return has no relationship. There was an argument supported by Kiganda (2014) that the inflation is insignificantly but positive relationship on banks' profitability of the bank in Sub-Saharan Africa (SSA). According to their research, it found that the macroeconomic is no related to affect the bank profitability. The effect of factors on bank's profitability is the internal factors. It showed that the inflation would not highly affect the bank's profitability.

2.2.6 Shadow Banking

In enormous of literature that highlights on the bank profitability, there is still a lack of scholars studying to determine whether the shadow banking ratio influence to the banks' profitability in Malaysia. They includes forward exchange contracts, guarantees, revolving credits and other lines of credits and financing obligations. Shadow banking can be explained as a type of financial innovation. Shadow banks' functions are similar with any traditional banks, they facilitate and provide liquidity and credit to people within an economy of a country. Although shadow banks involve main commercial bank activities such as lending and deposit activities, however the main objective of shadow banks is to transfer traditional banking

activities into securitized credit such as short-term funding and credit cards (Adrian and Ashcraft, 2015; Gennaioli, 2015; Metrick, 2014). Moreover, one of the characteristics of the shadow bank is they cannot borrow money from the central bank or government when they are in financial distress, which is unlike with the traditional banks because the government will act as a last resort of lender for them. There are several proxies have been used in previous research to measure the shadow banking ratio. For instance, Tang and Wang (2015) denoted the percentage of Net fees and commission's income/ Total revenue as the measurement of shadow banking ratio in their study of selected Chinese commercial banks. While Al-Awawdeh and Al-Sakini (2017) measured shadow banking ratio by percentage of Off-balance items/ Total asset in Jordon banking industry because of all non-traditional activities are included in off-balance sheet items. Most of the researches such as Calmes and Theoret (2011) and Huang (2011) calculated non-interest income as the proxy of shadow banking ratio. As it has revealed that fee-based income is a better proxy to measure shadow banks' business.

In their influential paper, Tang and Wang (2015) examined the effect of shadow banking ratio on risk-adjusted return which measured by the sharp ratio, has a positive and significant relationship in selected Chinese commercial banks. Positive relationship indicates that banks operate more shadow banking business will generate higher return on asset. The combination of running shadow banking and traditional banking activities together reduce risk through diversification and at the same time, increase the profit of the banks. Since the shadow banking is a financial innovation therefore it is regulated by less government regulatory system and also can satisfy the various complicated demand of the customers, thus attract more strategic clients and earn more shadow banking income (Tang & Wang, 2015). Moreover, Meeks, Nelson and Alessandri (2014) and Swain and Panda (2017) further added that it is a positive and significant relationship between shadow banking ratio and return on bank. Since shadow banking as a financial innovation help bank reducing transaction costs and taxes,

improving operation efficiency and therefore increasing return on bank. The study of Busch and Kick (2015) in a sample of 13 commercial banks in German supported that shadow banking is significantly and positively related to bank's return which is measured by ROA. Due to shadow banking lead to information asymmetry by making financial product and transaction in a more difficult and complex way to understand and disclose. So it can maximize the bank's profitability by conducting adverse selection. Based on the reasons above, it can conclude that the bank enjoy more profit as increase in non-traditional activities by carrying out shadow banking business.

In contrast, there are some past studies found a negative and significant relationship between shadow banking ratio and return on bank. For example, in the study by Calmès and Liu (2015) aimed to determine the shadow banking ratio which is measured by non-interest income on the risk-adjusted profit in Canadian financial system. The evidence showed that the non-interest income is more fluctuate than interest income, so lead to increase the instability of bank's revenue. Therefore, the shadow banking business do not increase the income rate. Although banks do not get advantage of running shadow banking but in order to maintain the bank's competitiveness and survival in the long term. Hirtle and Stiroh (2015) also supported that shadow banking ratio and bank's profit has a negative and statistically significant relationship in their research on America banking industry. Based on the evidence, an increase in percentage of shadow banking ratio will gain more volatility on risk-adjusted return, thus reducing return. Due to the banks expand their business from bank branch towards electronic banking such as electronic delivery and automated teller machines (ATMs), the fluctuation of non-interest income becomes more severe which lead to offset revenue from shadow banking business, thus risk-adjusted return does not increase. Furthermore, the research done by Mndeme (2015) in a sample of 25 banks in Tanzania found a negative and significant relationship. It indicates that the banks do not obtain benefit through diversification

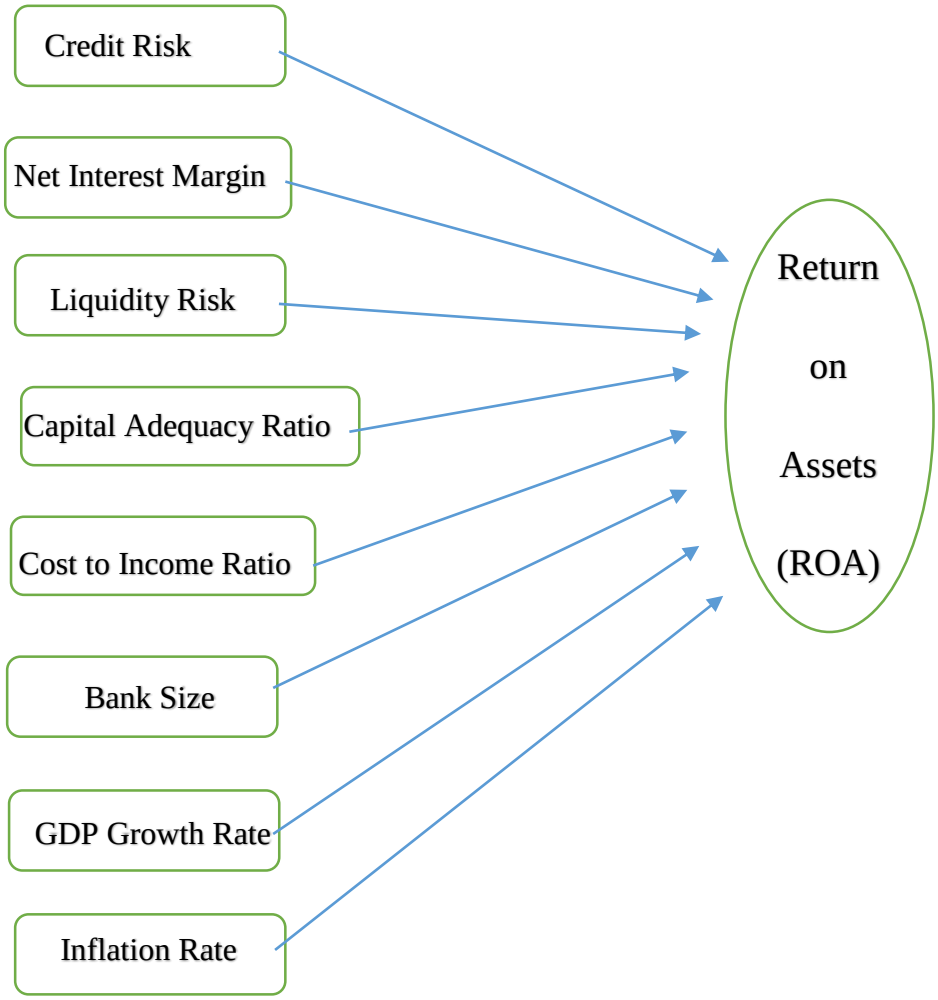
outside their traditional loan activities and cannot manage well in doing shadow banking business due to less experience, thus lead to lower average profitability. Mercieca, Schaeck and Wolfe (2015) examined the impact of shadow banking ratio in Europe banking structure give the similar conclusion.

However, some researcher claimed that the shadow banking ratio is not statistically significant to the bank's profitability. For example, Karim, Abd and Gee (2015) reported that the shadow banking ratio has statistically insignificant to the bank's profitability in Malaysia banking area. Similarly, William (2016) found that shadow banking ratio has insignificant relationship on bank return. The non-interest income is more instability than the net-interest income, although there is a less correlation between growth rate and non-interest income. However, in the end there is no relationship between shadow banking ratio and return on asset.

2.3 Theoretical and Conceptual Framework

2.3.1 Previous Theoretical Framework

Figure 2.1 Determinants of Bank Profitability: A Comparative Study of Indian Banks

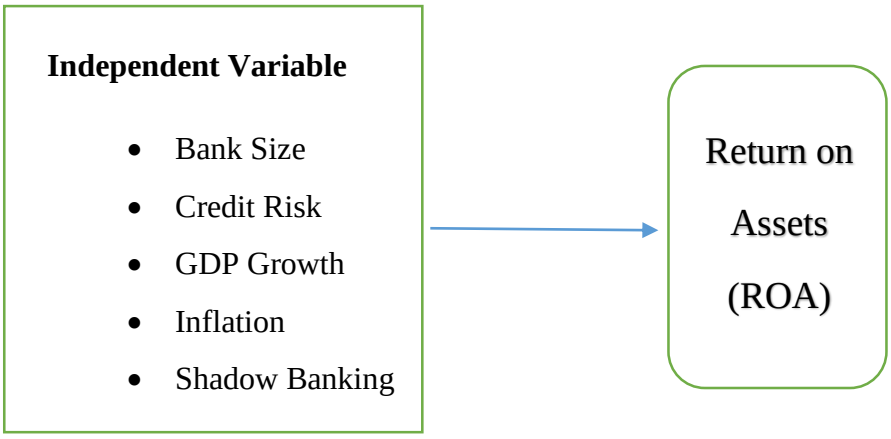


Adapted from "Determinants of Bank Profitability: A Comparative Study of Indian Banks" by Boateng (2018). The researchers examined the external and internal factors of bank return in India, the independent

variables are credit risk, net interest margin, liquidity risk, capital adequacy ratio, and cost to income ratio, bank size, GDP growth rate and inflation rate. Ten Indian banks have been investigated in this research for the period of seven years. Multiple regression have been used to examine the significant relationship between each independent variable and dependent variable.

2.3.2 Proposed Conceptual Framework

Figure 2.2 Influence of Shadow Banking, Bank Size, Credit Risk, and Macroeconomics Factors on Return: The Case of Banks in Malaysia



2.4 Conclusion

This chapter includes the review of previous studies and relevant theoretical models as the guidelines for this study. The independent variables comprise of bank-specific determinants (bank size, credit risk, shadow banking) and

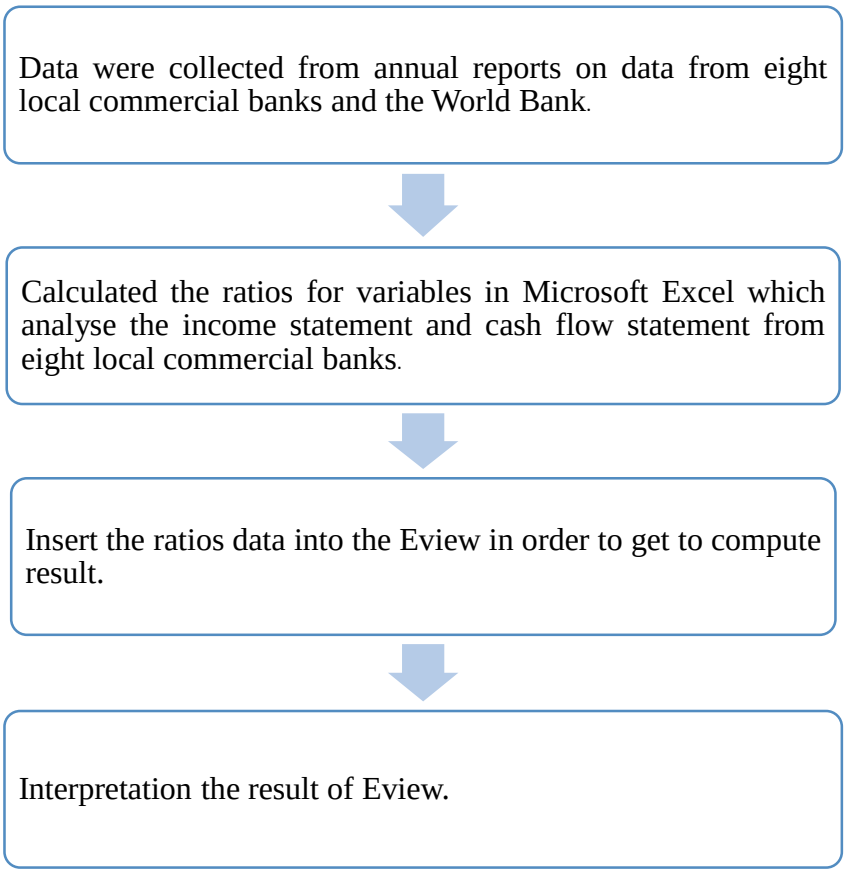
macroeconomic variables (GDP growth, inflation). The observational data will be collected from trustworthy database and will discuss in the next chapters.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter will discuss various subtopics including the research design, source of data, definition of variable, model estimation, types of tests with hypothesis, and analysis method. The research objective is to investigate the impact of bank size, credit risk, GDP growth, inflation and shadow banking on bank's profitability using a measure of Return on Asset (ROA) represent return. A secondary data sets from annual reports of banks and World Bank Data are used to conduct a quantitative research. The sample design of bank specific factors is made up of eight banks in Malaysia over sampling period of 2003-2017. In terms of source of data, the unit of measurement used to display the data which supported by other researches are specified. Last but not least, this chapter also include a preview of types of quantitative tests for next chapter and also the analysis method associated with the secondary data collected.

3.1 Data Processing



3.2 Research Design

Research design acts as an essential guidelines for researchers to study a research. This research adopts the method of quantitative research to describe, test and examine the causal relationships between bank-specific and macroeconomic variables in long-term and short-term profitability of Malaysia's commercial banks. At the same time, exploratory research is adopted for unclear research questions. For instance, there is lack of literatures support that whether Shadow

Banking will bring a significant influence on the Malaysia's commercial bank profitability.

Return on Assets (ROA) was used as research independent variable whereas Credit Risk (CR), Inflation (INF), Bank Size (BS), Gross Domestic Product (GDP), and Shadow Banking (SB) were used as research dependent variables. Among the explanatory variables, CR, BS and SB role as bank-specific independent variables while INF and GDP role as macroeconomic independent variables. In line with previous studies on bank profitability, ROA is defined as the ratio of net profits to total assets. The estimation model by Boateng (2018) was includes to verify data behavior and to see the signs of correlations between the independent variables and dependent variables. The author claimed that commercial banks profitability are determined by credit risk, net interest margin, liquidity risk, capital adequacy ratio, cost to income ratio, bank size, GDP growth rate and inflation rate. A research framework will be derived from the estimation model in order to obtain valid and unbiased results.

Since all independent and dependent variables involves quantitative measures, therefore this research collect 15 years' quantitative data from World Bank and Annual Reports based on eight commercial banks in Malaysia from year 2003 until 2017. Based on this study, panel data was used and it is known as the grouping of cross-sectional data and time series data. Therefore, the sample size of panel data is 120 (8 local commercial banks ×15 years period). After that all proxies were calculated based on the data collected. The reason why 120 sample sizes were selected is that the greater the sample size, the higher the chances to achieve normal distribution.

3.3 Source of data

In this research, secondary data analysis is involved in an attempt to examine impact of various variables on bank profitability. The bank-specific variables and macroeconomic variables are obtained from different sources to form a secondary data set. For bank-specific variables, this research reviewed the annual reports of eight banks in Malaysia which are Public Bank, Maybank, Hong Leong bank, CIMB Bank, Ambank, RHB Bank, Affin bank, and Alliance Bank Malaysia for the year 2003-2017. The commercial banks' annual report is accessed at respective bank official website and also Bursa Malaysia's website where only the audited annual reports are taken into account thereby the data reliability is ensured. The data for this study are built based on the figure acquired on income statement and statement of financial position in the annual report of the bank. The secondary data set computed by applying standardized unit measurement and technique for each of the variable to ensure the consistency. On the other hand, data for macroeconomic variables in this study has been acquired from World Bank covering period from 2003 to 2017. The data computed in Excel worksheet is then being imported into and making analysis with EViews. The list of variables, proxy, data sources and references are shown in following:

	Variables	**Proxy for variables**	**Data sources**	**References**
Dependent variable	Return on Assets	Total Income / Total Asset	Annual reports	Tan (2016)
Independent variables	Bank Size	Logarithm of Total Asset	Annual reports	Tan (2016)
	Credit Risk	Non-Performing loan / Total Loan	Annual reports	Sohaib and Qazi (2016)

	GDP	GDP Growth Rate	World Bank Data	Tan (2016); Rifat (2016)
	Inflation	Consumer Price Index	World Bank Data	Tan (2016)
	Shadow Banking Ratio	Non-Interest Income	Annual reports	Tang and Wang (2015); Calmes and Theoret (2011)

3.4 Definition of Variables

3.4.1 Return on Assets

Return on assets refers to the measurement of the entire of banks' profitability. It is measured by total income divided by total assets of the banks. When the banks are good in management or efficiency to manage their assets which will force the high ROA result. It indicates that the good management of the banks when the assets which able to transfer into revenue. Moreover, there has proved that the ROA is the best indicator to measure the banks' profitability as compared to return on equity (ROE) and net interest margin (NIM). ROA measures the ability of the banks by using the assets to earn the profit and will not be affected by the high

equity multiplier. ROE is not preferable due to the profit is more likely on shareholders perspective (Ong & Teh, 2013). Another reason is the high ROE does not mean that high profit, but ROA is suitable because of total assets have merged liabilities and equity's components (Saeed & Zahid, 2016). While NIM is the calculated the profit on the interest loan, financial trade and overdraft which some of these have included in total assets itself. When the NIM decrease means that the quality of the assets will drop as well (Ong & Teh, 2013).

$$\text{Return on Assets} = \frac{Total\ Income}{Total\ Assets}$$

3.4.2 Bank Size

Bank size is the important cause that would affect the bank profitability. Commonly, the bank size is larger which may have the influence on the profitability of bank such as the loan, deposit, investments, intangible assets and equipment. (Ong & Teh, 2013). The expected relationship between bank size and bank profitability is positive. The more assets of the bank have, the more profit the bank gains such as the loan. Moreover, there has a negative relationship due to the complexity of the larger bank which could not manage well their management in order to reduce their profit at the same time. Bank size is also included as an independent variable to explain diseconomies or economies of scale (Sehrish, Irshad & Zaman, 2011). While the amount of total assets is huge, which may have the problem of the data analysis. Therefore, the proxy of the bank size is the natural logarithm of total assets in the bank (Tan, 2016).

$$\text{Bank Size} = \text{Log (Total Assets)}$$

3.4.3 Credit Risk

Credit risk is also called default risk. Credit risk using the internal data to examine the quality of the loan (Saeed & Zahid, 2016). It is the largest risk to influence the bank's profitability when the third party unable to pay back the interest payment or principal. The bank establish the management of credit risk to control the internal process in order to reduce the credit risk. The higher of non-performing loan represent that the higher credit risk of the bank has. Non-performing loan is the borrower unable to repay the repayment of obligation which considered the losses for the bank (Veizi, Mano & Kociu, 2016). According to Saeed and Zahid, the researchers showed that the mainly affected on credit risk is non-performing loan. The influence on non-performing loan is based on market, ratio of capital, bank size, raise of GDP growth and other. Thus, the proxy of the credit risk is non-performing loan divided by total loan for each bank.

$$\text{Credit Risk} = \frac{\text{Non performing Loan}}{\text{Total Loan}}$$

3.4.4 GDP Growth

GDP growth is an indicator of economic growth in a country. It measures a country's economic output. It has divided into four components which are personal consumption, business investment, government spending and net trade (Amadeo, 2018). GDP growth has positive impact on the bank profitability. When the higher of GDP growth rate will influence the net interest rate of the bank make and improve the loan losses. Besides that, the higher of GDP growth also means that the reduction on unemployment

and the income of consumer increased. Thus, the consumer would have the ability to repay the loan which affect the bank profitability to increase (Combey & Togbenou, 2017).

$$\text{GDP Growth} = \text{GDP Growth Rate (annual \%)}$$

3.4.5 Inflation

Inflation refers to the rate that increasing in price levels on the goods and services in economy over the time. The measurement of the inflation is consumer price index (CPI) by referring the World Bank which has showed the annual percentage change in Malaysia. CPI is based on the price changes of fixed market basket on consumer goods and services that spending pattern of all households in Malaysia. The relationship of inflation and bank profitability could be in positive and negative which is depends on the expected or unexpected on inflation rate. When there is a positive impact on banks' profitability is due to the expected inflation rate increases which the bank changing the interest rate on loan to ensure that the can absorb the loss from inflation (Tariq et al, 2014). While the negative impact is due to the unexpected rate for inflation increase will influence the cost is larger than the revenue the banks have earned (Yao et al, 2018).

$$\text{Inflation} = \text{Consumer Price Index (annual \%)}$$

3.4.6 Shadow Banking

Shadow banking is defined as non-traditional banking activities. It involves process of selling loan into securitization. It helped to minimize the risk of bank for holding customer loan. There has few proxies to measure the shadow banking includes off-balance sheet items, net non-interest incomes and net fees and commissions. In this research, this study will use net fees and commissions divided by total revenue to compute shadow banking. It is because Tang and Wang (2016), stated that the component of shadow banking is included in net fees and commissions.

$$\text{Shadow Banking} = \frac{Net\ Fees\ and\ Commissions}{Total\ Revenue}$$

3.5 Data Analysis

3.5.1 Pooled OLS Model

This study is using Pooled OLS regression due to the panel data from eight banks in Malaysia. Pooled OLS regression is also called as 'Constant Coefficient Model'. It is one of a panel data models type. Before to use the Pooled OLS regression, it must fulfil three of the expectations that had set for this regression. There are the intercepts and slopes of this model are constant across banks, and time-invariant. Besides that, there have two situations to show that when to use the Pooled OLS method. The first

condition is the all the objects are uniformity. It has the same characteristic and no time effect. While the second condition is uncorrelated among the independent variables with the error term. It means that the assumption in the error term is independently and identically in order to get valid in normality distribution. Moreover, there also assumed that the regressors are the unidirectional relationship. Thus, the independent variables can be influenced dependent variable but the dependent variable does not affect to independent variables (Gujarati & Porter, 2009).

3.5.2 Fixed Effect Model

This research is using Fixed Effect Model to estimate the model. When use fixed effect model to estimate, there is two conditions must be fulfilled. First condition is the error terms and the independent variables are correlated. Second condition is the model must have different characteristics and there is no time invariant between years. The fixed effect model assumes that the slopes are fixed across banks and there is no time effect. However, there has a different intercept between banks. This fixed effect model assumes that the cross sectional or individual-specific error component is random or not constant. Besides that, the combination between time series (*t*) and cross-sectional (*i)* error component is assumed has normally distributed. Moreover, the fixed effect model has distinguish between the various observation in term of effect and characteristic across periods, therefore the estimated parameter values will become biased, efficient and consistent (Gujarati & Porter, 2009).

3.6 Econometric Diagnosis Tests

3.6.1 Poolibility Test

Poolibility test is used to decide whether pooled OLS model or fixed effect model is more accurate to estimate the panel regression model. The null hypothesis for the model is pooled OLS model is more preferable while the alternative hypothesis is fixed effect model is more preferable. If the result for the testing is reject the null hypothesis, it means that there is no common intercept on all the banks and hence fixed effect model is more preferable to be used for the panel data regression model (Gujarati & Porter, 2009).

3.6.2 Hausman Test

Hausman test is a classical test to decide whether the panel regression model is with fixed effect model or random fixed model or a test for model misspecification. Before the test is carrying out, the predictor variables have to be endogenous. The null hypothesis is the random effect model is consistent and efficient while the alternative hypothesis is the random effect model is inconsistent and inefficient. It also known as the fixed effect model will be always consistent. When the null hypothesis is rejected, it implies that the fixed effect model is more suitable than random effect model in the panel data regression model (Nwakuya & Ijomah, 2017).

3.6.3 Multicollinearity

Multicollinearity exists when there is an exact linear relationship in a regression model among some or all explanatory variables. If the multicollinearity problem exist, the regression model is unable to recognize the influence of the independent variable on the dependent variable. There is no specific method to detect multicollinearity problem or measure the extent. However, there are some suggested rule of thumb. Firstly, model with high R^2 but few significant *t* ratio. In general, the hypothesis will be rejected as the partial slope coefficient is simultaneously equal to zero in the contest of model with high R^2 (more than 0.8). Secondly, pair wise correlations among regressors is high. High pair wise (more than 0.8) is an indicator of the existence of serious multicollinearity problem in a model (Gujarati & Porter, 2009).

3.6.4 Normality Distribution

Normality is a test to ensure results of hypothesis testing retains the validity. When the model result does not shows normality, it will forces the hypothesis testing cannot be trusted. The reasons why this research follows normality assumption are that researchers hope there has the small influence on these omitted variables and at the best random. When the assumptions do not taken into account, it is impossible to retain the accurate and reliable conclusions consistent with reality. The statistics of the central limit theorem (CLT) can prove that, if there are a large number of independent and identically distributed random variables, the distribution of these variables tends to be normal as the number of them increases (Gujarati & Porter, 2009). When the sample size is large enough (more than 40), it can be assumed that the violation of the normality assumption will not bring major problems. This result that researchers can

use parameterization even when the data are not normally distributed (Ghasemi & Zahediasl, 2012).

The probability distribution of Ordinary Least Square (OLS) estimators can be easily derived because of a normal distribution of any linear function itself. It makes the task of hypothesis testing very straightforward. Finally, if the observation is small or limited sample size which is less than 100 observations, the normality distribution assumes a key role. One of the main tests for the assessment of normality is Jarque-Bera (JB) test. The skewness and kurtosis are needed before to test the JB test. These are the two main elements that will be show in the result whether the error term has the normality or not (Gujarati & Porter, 2009).

3.6.5 Unit Root Test

The unit root test is the stability test has been widely used in the past few years such as the unchanged of mean, variance, and covariance. For unit root test, there is using the 10% of significant level to test the data.

H_0 = The model is no stationarity.

H_1 = The model is stationarity.

Decision rule: Reject H_0. When the p-value is less than significant level. Otherwise, do not reject H_0.

Decision making: Reject H_0, since the p-value is less than the 10% of significant level.

Conclusion: There is sufficient evidence to conclude that the model is stationarity.

3.7 Conclusion

In conclusion, this chapter covering the research design, collection and processing of data and also the methods and tests to use for accurate data analysis. The data computed in Excel worksheet is then being imported into and making analysis with E-view. In the following chapter 4 will be presenting the findings and discussion of the results obtained.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

This chapter is computed the data through the E-view and interpret the results of the data analysis for the factors that influence on bank's profitability of eight local banks in Malaysia from 2003 to 2017. This chapter have analysed two types of model which are Pooled Ordinary Least Square (Pooled OLS) Model and Fixed Effect Model (FEM) in order to test which one is more suitable. Besides that, there also have tested the significance of independent variables and the whole model by using the result from E-view. For the diagnostic section, there will check the Poolibility test, Hausman test, Unit Root test, multicollinearity, and normality test.

4.1 Pooled OLS Model

Based on the e-view result, the Pooled OLS Model is stated as below:

ROAit = 0.009037-3.18E-16 BSit -0.006143 CRit + 0.026760 GDPit + 0.005240 INFit +2.50E-13 SBit

Table 4.1 E-view result – Pooled OLS Model

Variable	Coefficient	Standard Error	t-statistic	Probability
BS	-3.18E-16	1.65E-15	-0.192679	0.8477
CR	-0.006143	0.021717	-0.22874	0.7781

GDP	0.026760	0.012933	2.069186	0.0420
INF	0.005240	0.025311	0.207035	0.8366
SB	2.50E-13	1.21E-13	2.067703	0.0422

4.2 Fixed Effect Model

Based on the e-view result, the FEM is stated as below:

ROAit = 0.007326 -0.001034 AFFIN + 4.89E-05 ALL -0.005098 AMBANK - 0.000626 CIMB+ 0.001938 HL+ 0.000900 MAYBANK + 0.004843 PUBLIC – 0.001035 RHB -7.02E-15 BSit + 0.065708 CRit + 0.034046 GDPit + 0.000957 INFit + 9.93E-13 SBit

Table 4.2 E-view result – Fixed Effect Model (FEM)

Variable	Coefficient	Standard Error	t-statistic	Probability
BS	-7.02E-15	3.28E-15	-1.837193	0.0707
CR	0.065708	0.031620	2.078012	0.0416
GDP	0.034046	0.011664	2.918979	0.0048
INF	0.000957	0.021900	0.043695	0.9653
SB	9.93E-13	5.34E-13	1.858283	0.0676

Interpretation of Intercept:

$\beta_{1\ AFFIN}$ = 0.007326 + (-0.001034) = 0.006292

Without the bank size, credit risk, GDP growth, inflation, and shadow banking, on average, the bank's profitability (ROA) for Affin bank is RM 0.006292.

$\beta_{1\ ALL}$ = 0.007326 + (0.0000489) = 0.0073749

Without the bank size, credit risk, GDP growth, inflation, and shadow banking, on average, the bank's profitability (ROA) for Alliance bank is RM 0.0073749.

$\beta_{1\ AMBANK}$ = 0.007326 + (-0.005098) = 0.002228

Without the bank size, credit risk, GDP growth, inflation, and shadow banking, on average, the bank's profitability (ROA) for Ambank is RM 0.002228.

$\beta_{1\ CIMB}$ = 0.007326 + (-0.000626) = 0.0067

Without the bank size, credit risk, GDP growth, inflation, and shadow banking, on average, the bank's profitability (ROA) for CIMB bank is RM 0.0067.

$\beta_{1\ HL}$ = 0.007326 + (0.001938) = 0.009264

Without the bank size, credit risk, GDP growth, inflation, and shadow banking, on average, the bank's profitability (ROA) for Hong Leong bank is RM 0.009264.

$\beta_{1\ MAY}$ = 0.007326 + (0.0009) = 0.008226

Without the bank size, credit risk, GDP growth, inflation, and shadow banking, on average, the bank's profitability (ROA) for Maybank is RM 0.008226.

$\beta_{1\ PUBLIC}$ = 0.007326 + (0.004843) = 0.012169

Without the bank size, credit risk, GDP growth, inflation, and shadow banking, on average, the bank's profitability (ROA) for Public bank is RM 0.012169.

$\beta_{1\ RHB}$ = 0.007326 + (-0.001035) = 0.006291

Without the bank size, credit risk, GDP growth, inflation, and shadow banking, on average, the bank's profitability (ROA) for RHB bank is RM 0.006291.

4.3 Significance of Independent Variables

4.3.1 Bank Size

H_0: $\beta_2 = 0$

H_1: $\beta_2 \neq 0$

Significant level: 0.10

Decision rule: Reject H_0. If the p-value is less than significant level (0.10). Otherwise, do not reject H_0.

P-value: 0.0707

Decision making: Reject H_0, since the p-value (0.0707) is less than critical value (0.10).

Conclusion: There is sufficient evidence to conclude that has relationship between bank size and bank's profitability in Malaysia at 10% significant level.

Interpretation: If the ROA increases by RM 1,000,000,000, on average, the bank size for each bank will decrease by 0.0000702, ceteris paribus.

4.3.2 Credit Risk

H_0: $\beta_3 = 0$

H_1: $\beta_3 \neq 0$

Significant level: 0.10

Decision rule: Reject H_0. If the p-value is less than significant level (0.10). Otherwise, do not reject H_0.

P-value: 0.0416

Decision making: Reject H_0, since the p-value (0.0416) is less than critical value (0.10).

Conclusion: There is sufficient evidence to conclude that has relationship between credit risk and bank's profitability in Malaysia at 10% significant level.

Interpretation: If the ROA increases by RM 1,000, on average, the credit risk for each bank will increase by 65.708, ceteris paribus.

4.3.3 GDP Growth

H_0: $\beta_4 = 0$

H_1: $\beta_4 \neq 0$

Significant level: 0.10

Decision rule: Reject H_0. If the p-value is less than significant level (0.10). Otherwise, do not reject H_0.

P-value: 0.0048

Decision making: Reject H_0, since the p-value (0.0048) is less than critical value (0.10).

Conclusion: There is sufficient evidence to conclude that has relationship between GDP growth and bank's profitability in Malaysia at 10% significant level.

Interpretation: If the ROA increases by RM 1,000, on average, the GDP growth for each bank will increase by 34.046%, ceteris paribus.

4.3.4 Inflation

$H_0: \beta_5 = 0$

$H_1: \beta_5 \neq 0$

Significant level: 0.10

Decision rule: Reject H_0. If the p-value is less than significant level (0.10). Otherwise, do not reject H_0.

P-value: 0.9653

Decision making: Do not reject H_0, since the p-value (0.9653) is more than critical value (0.10).

Conclusion: There is sufficient evidence to conclude that has no relationship between inflation and bank's profitability in Malaysia at 10% significant level.

Interpretation: If the ROA increases by RM 1,000, on average, the inflation for each bank will increase by 0.957%, ceteris paribus.

4.3.5 Shadow Banking

H_0: $\beta_6 = 0$

H_1: $\beta_6 \neq 0$

Significant level: 0.10

Decision rule: Reject H_0. If the p-value is less than significant level (0.10). Otherwise, do not reject H_0.

P-value: 0.0676

Decision making: Reject H_0, since the p-value (0.0676) is less than critical value (0.10).

Conclusion: There is sufficient evidence to conclude that has relationship between shadow banking and bank's profitability in Malaysia at 10% significant level.

Interpretation: If the ROA increases by RM 1,000,000,000, on average, the shadow banking for each bank will increase by 0.00993, ceteris paribus.

4.3.6 Significance of Whole Model

H_0: The whole model is no significance.

H_1: The whole model is significance.

Significant level: 0.10

Decision rule: Reject H_0. If the p-value is less than significant level (0.10). Otherwise, do not reject H_0.

P-value: 0.000020

Decision making: Reject H_0, since the p-value (0.000020) is less than critical value (0.10).

Conclusion: There is sufficient evidence to conclude that the whole model is significant at 10% significant level.

4.4 R-Squares

R^2 = 0.557752

It is about 55.78% of variation in bank's profitability (ROA) can be explained by variation in all independent variables which are bank size, credit risk, GDP growth, inflation, and shadow banking.

The remaining 44.22% of the variation of bank's profitability is explained by the other factors.

4.5 Poolibility Test

Table 4.3 Result of Poolibility Test

Effects Test	Statistic	Degree of Freedom	Probability
Cross-section F	5.3929	(7,67)	0.0001

H_0: Pooled OLS Model is better.

H_1: Fixed Effect Model is better.

Significant level: 0.10

Decision Rule: Reject H_0 if the p-value is less than significant level. Otherwise, do

not reject H_0.

P-value = 0.0001

Decision: Reject H_0 since p-value (0.0001) is smaller than the significance level of

10%.

Conclusion: There is no commom intercept on all the banks. Therefore, Fixed Effect Model is better at the significant level of 10%.

4.6 Hausman Test

Table 4.4 Result of Hausman Test

Test Summary	Chi-Square Statistic	Chi-Square Degree of Freedom	Probability
Cross-section Random	9.8546	5	0.04751

H_0: Random Effect Model is consistent and efficient.

H_1: Fixed Effect Model is consistent and efficient.

Significant level: 0.10

Decision Rule: Reject H_0 if the p-value is less than significant level. Otherwise, do

not reject H_0.

p-value = 0.04751

Decision: Reject H_0 since p-value (0.04751) is smaller than the significance level of

10%.

Conclusion: It can be concluded that the Fixed Effect Model is better at the significant level of 10%.

4.7 Multicollinearity

Table 4.5 Correlation between all independent variables

Correlation	LOG BANK SIZE	CREDIT RISK	GDP GROWTH	INFLATION	SHADOW BANKING
LOG BANK SIZE	1.000000	-0.044743	0.144667	-0.032783	0.188502
CREDIT RISK	-0.044743	1.000000	-0.137924	-0.041369	0.086998
GDP GROWTH	0.144667	-0.137924	1.000000	0.457194	0.077899
INFLATION	-0.032783	-0.041369	0.457194	1.000000	-0.005392
SHADOW BANKING	0.188502	0.086998	0.077899	-0.005392	1.000000

According to table 4.1 above, there showed that all of the independent variables (bank size, credit risk, GDP growth, inflation, and shadow banking) do not have serious multicollinearity as the correlation does not higher than 0.80 (80%) for all of the independent variables. It indicated that there has no problem exist in this model. It can prove that all of the independent variables is able to influence the dependent variable (ROA).

4.8 Normality Test

Table 4.6 Result of Jarque-Bera Normality Test

Jarque-Bera	5.304168
Probability	0.070504

H_0: The error terms are normally distributed.

H_1: The error terms are not normally distributed.

Significant level: 0.05

Decision Rule: Reject H_0 if the p-value is less than significant level. Otherwise, do

not reject H_0.

p-value = 0.070504

Decision: Do not reject H_0 since p-value (0.070504) is greater than the significance level of 5%.

Conclusion: The model meets the normality assumption on the error term.

4.9 Unit Root Test

Table 4.7 Result of Unit Root Test

Null: Unit Root	Probability
Im, Pesaran and Shin W-stat	0.0000
ADF - Fisher Chi-square	0.0000
PP - Fisher Chi-square	0.0000

H_0: The model is not stationary.

H_1: The model is stationary.

Significant level: 0.10

Decision Rule: Reject H_0 if the p-value is less than significant level. Otherwise, do

not reject H_0.

p-value = 0.0000

Decision: Reject H_0 since p-value (0.0000) is smaller than the significance level of 5%.

Conclusion: The model is stationary at the significant level of 10%.

4.10 Conclusion

In conclusion, the model is generated in form of FEM after investigated the Poolibility test and Hausman test by using the result of E-view, which is proved that the FEM is better than Pooled OLS model. It indicated that the model is to meet two conditions. Firstly, there has correlated between the error terms and the explanatory variables. Secondly, the characteristic object can be changed. FEM assumes that the common intercepts are different across eight local banks, the slopes are fixed across eight local banks and there is no time effect between years. The FEM differentiates the various observational effects and characteristics across phases. So, the estimated parameter values will be biased, effective and consistent. Besides that, R-square result from E-view is high which more than 0.50 and the whole model is significant. There are four explanatory variables (bank size, credit risk, GDP growth and shadow banking) are significant on the bank's profitability apart from inflation showed that insignificant on the bank's profitability. The diagnostic test such as multicollinearity, unit root test, normality test, hausman test,

and poolibilty test have provided. Next chapter will continue to discuss on policy implication, limitation, and suggestion of the study.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATION

5.0 Introduction

This chapter concludes this entire study. Main findings of this study is discussed based on the literature review. Next, implementation of policies are suggested according to the study's results. Limitations of this study will also be revealed with description and provided with several recommendations to relevant parties within Malaysia context for future studies.

5.1 Summary of Statistical Analysis

Table 5.1 Result of Statistical Analysis

FEM:	P-value	Decision Making	Conclusion
Bank Size	0.0707*	Reject H_0	Negative and Significant
Credit Risk	0.0416**	Reject H_0	Positive and Significant
GDP Growth	0.0048***	Reject H_0	Positive and Significant

Inflation	0.9653	Do not reject H_0	Positive and Insignificant
Shadow Banking	0.0676*	Reject H_0	Positive and Significant
Significant of Whole Model	0.000020***	Reject H_0	Significant
Diagnosis Testing:			
Poolibility Test	0.0001	Reject H_0	FEM is preferable
Hausman Test	0.04751	Reject H_0	FEM is preferable
Unit Root Test	0.00000	Reject H_0	Model is stationary
Multicollinearity	-	-	All variables are less than 80%, which do not have serious multicollinearity problem.
Normality Test	0.070504	Do not reject H_0	Normality

*10 percent of significance level

**5 percent of significance level

***1 percent of significance level

The model is generated in form of FEM which by using the result of E-views. There has five independent variables, which there have four independent variables (bank size, credit risk, GDP growth and shadow banking) are a significant

relationship on the bank’s profitability at 10 percent of significant level. The inflation has no significant relationship on the bank’s profitability at 10 percent of significance level. For the whole model, it is using the F-statistic to test that the FEM is significant at 1 percent of significance level. Besides that, the diagnosis testing proved that the model is stationary, all variable does not have serious multicollinearity problem and the model is normality.

5.2 Major Finding

5.2.1 Bank Size

The result of this study realised a significantly negative relationship of bank size on the Malaysia commercial bank’s profitability. The result is in conformity with previous studies which also realized a negative significant relationship (Aladwan, 2015; Almazari, 2014). The administration can be too complex and incur related costs to the management of the commercial bank that are too large in size. The costs incurred are agency costs, bureaucratic costs and other expenses that make the economies of scale to diminish and diseconomies of scale then appears. The agency costs go higher when multiple-market activities are involved, eliminating diversification benefits. Hence, profitability of a bank would be negatively affected. Also, the decrease of a large bank’s profitability might be the higher start-up costs where the bank invested heavily in technology such as high-priced computer mainframes that causing the lower of bank profit. Another main reason for lower profitability rates are the political costs and research and development costs the large banks exposed to in comparison to smaller ones. Smaller bank can be more profitable as they are often with

increasing scale of economies. From that, better utilize of specialized inputs lead to higher operation efficiency where for example, expert loan officers are dedicated to particular line of business. Furthermore, small banks could establish stronger connections with customers and businesses in local market and hence, making wiser credit underwriting decision by taking advantages from price setting and information gain.

5.2.2 Credit Risk

The result claimed unexpected result that credit risk has a significant and positive effect on measuring bank performance towards commercial bank in Malaysia indicates that high non-performing loan to total loan increase bank's ROA. The findings are in line with previous researchers Panta (2018), Alshatti (2015), Kutum (2017), Saeed and Zahid (2016). It can be concluded that although credit risk is often negative associated with bank stability, but it gains profitability by supporting bank to adjust higher interest rates to prevent the credit risk to accelerate. During the impact of global financial crisis in 2008, Malaysian banking system learned how to reimburse the credit risk through maximizing their income from interest rates, fee, commissions and other fees charged from loans, and leveled up the application and approval of loans thus making high risk to high return on bank performance. Although the more the loans made by banks to customers bring the higher possible default risks, banks charge higher interest rates or extra risk premiums to borrowers will led to positive relationship between credit risk and bank profitability. Moreover, banks announced to provide more preferential credit for small and medium-sized enterprises after undertaking risky projects can encourage bank growth, as the further support of higher credit risk to higher ROA (Panta, 2018).

5.2.3 GDP Growth

Based on the result, gross domestic product (GDP) had positively and significantly impact on domestic commercial bank's profitability in Malaysia. This result was supported by the previous studies include Ebenezer, Omar and Kamil (2017), Topak & Talu (2017), Curak, Popsoki and Pepur (2015) and Vejzagic and Zarafat (2014). Since GDP have a direct impact on the customer's demand and supply of deposits and bank loans, therefore, it can change the profit level and cash flows for domestic commercial banks during economic boom or recession. This can be explained that when the economic activities growth, the demand of credit will increase and lead to improvement in bank profitability. For instance, due to the increase of business opportunity, the citizen who like to make a loan with bank will increase during favourable economic condition, therefore the bank's profitability will enhance when the GDP increase. Moreover, the interest of loan which is the revenue for the bank will increase in the event of economic boom. In contrast, the demand of credits will reduce whereas nonperforming loan will increase when the GDP growth slows down during economic recession as a result of the nature of business cycle. During the unfavourable economic condition, the citizen will unable to return the loanable funds to the bank and lesser of the citizen would like to borrow from the bank. As consequences, the non-performing loans of banks increase which reduce the bank's profitability.

5.2.4 Inflation

The result showed there is insignificant relationship between the inflation and bank's profitability from 2003-2017. There has some of the researchers supported that the impact of inflation on bank's profitability is

insignificant, which is the changes of inflation do not influence on the profit of bank. They examined that the impact of inflation in the short-run and long- run will not affected the bank's profitability (Scott & Ovuefeyen, 2014; Combey & Togbenou, 2017). Besides that, Kiganda (2014) examined the result in positive insignificant between the inflation and bank's profitability. They found that the inflation as the macroeconomic would not affected the profit of bank. The factors to influence the bank's profitability are the internal factors. Therefore, there is no relationship between the inflation and bank's profitability.

5.2.5 Shadow Banking

Based on the result, it shows that the relationship between bank profitability and shadow banking is positive and significant result. According to the Tang and Wang (2015), they proved that doing more shadow banking business help banks to earn more profit. It is because carrying out the basic banking activities and shadow banking activities at the same time, reduce the risk and increase banks' return. Meeks, Nelson and Alessandri (2014) stated that the shadow banking is the banking financial innovation products so it is less regulated by Malaysian Central Bank, Bank Negara Malaysia, therefore it can fulfill different types of needs and wants which demanded by the bank customer so banks can get more profit by introducing shadow banking products since there is a number of demand in the market. In addition, Swain and Panda (2017) mentioned that it is a positive and significant relationship between bank profitability and shadow banking. It is because the shadow banking decreases business and operation cost and tax, so lead to increase the efficiency and effectiveness of banks' operation management and have a higher rate of bank return. Furthermore, Busch and Kick (2015) evidenced that the shadow banking business and bank profitability move in the same

direction, indicating there is a positive and significant relationship between them. The authors showed the banks conduct information asymmetry and adverse selection, indicates the banks have shadow banking product information that the bank customer do not have so the banks can maximize its return by making shadow banking product in a complicated way to understand by the bank customer.

5.3 Implication of the Study

5.3.1 Bank Size

Management of bank and policymaker are tied up with the actions should be taken for factor of bank size. The correlation between bank size and bank's profitability showed negative result, suggesting the existence of diseconomies of scale where the bank expand to a certain level and revenue diminishes. A more direct way for bank to operate in greater efficiency scale is come up with more innovative products and services through investing to acquire advanced banking technologies such as biometric security systems, that also driven to higher potential rate of profit, rather than expanding physical bank branch and subject to diseconomies of scale. To address banks to be "too big to fall", suggestion to policymakers to managers and shareholders to create and sustain aligned decision made with imposition of disciplinary action against failure (Feldman, 2010). Moreover, credible mechanism can be imposed by regulator to limit the scale economies of bank. A revised capital requirement serve as an incentive for the bank to downsizing retail banking division and also a strategy enable them to operate more

sustainable on scale (Feldman, 2010). The rising minimum capital requirement could give rise to the managers and shareholders to alter the bank size and structure. Furthermore, as large bank often associated with greater systematic risk, a capital charge should be imposed based on the risk that the financial firm imposed to. From that, the firm would then emphasize on the soundness of financial system to avoid the surcharges and in turn raise financial stability (Flamini et al, 2009).

5.3.2 Credit Risk

The findings from this study reflects an unexpected result that credit risk have a positive an significant impact on measuring on commercial banks performance in Malaysia. It means the studied banks have sufficient ability to increase with their financial performance with each unit changes of non-performing loan to total loan, ceteris paribus. Since credit risk is one of the important indicators for customers and investors to make an accurate investment decision, policy makers, regulators, bank managers and others related sites may recommended to implement some regulation and strategy to lower down the credit risk. They can restudy the existing credit risk management to grasp the reason why credit risk keep on increasing, and update the most recent credit risk analysis to reduce the default risk from their borrowers. In other ways to monitor the credit risk, it is recommended to maintain minimum regulated capital adequacy ratio to deal with increasing non-performing loan to make sure the operation of the bank can continue to ride on. Moreover, a prediction scheme may practice to identify on firm failure in order make a better decision making on the loan approval, thus slowly level down the credit risk exposure and level up the possibility to gain profit.

5.3.3 GDP Growth

Besides internal factors can affect the bank's profitability, macroeconomic factors also play an important role in determine the bank's profitability such as GDP growth. This study carried out the result that GDP has a significant positive relationship with domestic commercial bank's profitability in Malaysia. This explained that bank managers need to concern about the risk that may affect the profit of bank due to the changing of macroeconomic condition especially during favourable or unfavourable economic condition. Hence, policy maker can implement some of the policy such as monetary or fiscal policy aimed at stabilizing GDP growth so that it can help the banks to generate more profit and foster the financial intermediation. For instance, government can apply expansionary fiscal policy by increasing the government expenses or declining the taxes, whereas, central bank also can apply expansionary monetary policy by decreasing both discount rate and requirement reserve ratio and implement open market operation during unfavourable economic condition. As a consequence, it can increase the flow of money supply into the economy and hence it will eventually decrease the interest rate which encourage more of the investment. Last but not least, it can help the economy to free from the recession and finally economy growth and GDP increase. When the economic stable and growth, the domestic commercial bank's profitability will increase since the people will more likely to borrow from the bank for individual consumption purpose.

5.3.4 Shadow Banking

Based on the computation of E-view result, it showed the shadow banking is one of the independent variable that positively and significant influenced

to the bank profitability of all the Malaysian commercial banks. Therefore, Malaysian policy makers, Bank Negara Malaysia and bank managers and executives suggest implement policy to increase the proportion of carrying out shadow banking activities in order to increase the bank profitability of commercial banks. However, if there is a significant increase in running shadow banking business, the bank may influence its liquidity and credit management and lead to increase the liquidity and credit risks (Al-Awawdeh, H. & Al-Sakini, 2017). Therefore, this study recommend the Malaysian commercial bank manager and executive to seek and develop a certain level of shadow banking business benchmark to avoid banks from having too much shadow banking business and also enjoy higher rate of return at the same time.

Besides that, Bank Negara Malaysia and the Malaysian bank regulators suggest establish rules and regulation to determine the maximum allocation of running shadow banking in order to control bank from carrying out too much of these businesses. For example, Bank Negara Malaysia can release and issue official instruction about the execution of shadow banking business. Moreover, this study also advice bank managers and executives to carry out further practical exploration on how much the shadow banking should be allocated to maximise the bank return. In addition, the bank manager also propose to investigate the consequence of increasing the shadow banking business on the bank liquidity and credit risks that bank will face and find out what is the solution to solve this issue.

5.4 Limitations

In this study, the perceived limitation that limited time range of financial statements for bank internal factors is accessible compared to the wider range of macroeconomic data. This could be due to Bursa Malaysia website refurbish at times which limit the duration of this study.

Next, the shadow banking in Malaysia is defined broadly as to the credit intermediation performed that is beyond of conventional operations. However, the diverse measure as to the extent which the regulated bank involve in shadow banking activities is not fully defined. Hence, it creates limitations to the data as the ratios for bank internal factors in this study are largely depend on on-balance-sheet data.

Furthermore, the qualitative factor such as management efficiency which is crucial to bank profit has not been included on account of the complexity in capturing it with financial ratios may cause the study not able to define the determinant for topic in full.

Lastly, this study emphasizes only on domestic bank profits without concerning the foreign banks in Malaysia, therefore, unable to present the whole picture of how the determinants impact the banks in Malaysia context.

5.5 Recommendation

In future studies, it is recommended that the upcoming researchers that explore the related topic may try to include more banks to improve the data limitations. The data of bank-specific variables collected from financial statements have lesser

time span available compared to macroeconomic variables. Thus, it is recommended to include more banks to improve the consistency result since only eight local banks out of over 32 banks in Malaysia were used.

Other than that, future researchers are recommended to employ different tools to estimate the result of the data. Since all findings of this study is using E-View (Electronic View) to regress the data, other similar tools such as Stata, Statwing and SPSS which is also another good alternative for researchers to do the diagnostic checking to improve the reliability of the study. Moreover, DataStream that offer complete data information can improve the data collection method.

Secondly, the definition of shadow banking ratio is too broad will make the researchers feel unclear where to look for the shadow banking activity. Thus, it is recommended for future researchers to pay more attention to analyse more on shadow banking to examine whether it is one of the profitability determinants in Malaysia.

Lastly, this study does not include qualitative variables. Thus it is recommended to include qualitative variables other than quantitative variables. It is because qualitative variables is possible to become the key internal factor that determine bank profitability, for example management efficiency, employee performance index, customer service rating or central bank regulation that possible to become the underlying causes to influence the bank financial performance.

5.6 Conclusion

This purpose of this study seeks to investigate on macroeconomic and bank-specific determinants on eight commercial bank's profitability in Malaysia during

year 2003 to 2017. This study is using Fixed Effect Model for regress the data since the model is assuming to have different characteristics by taking global financial crisis into account and no time effect between years. At the end of the data analysis result, three out of five study variables reveals a positive and significant relationship to profitability which are credit risk, GDP and shadow banking ratio. Inflation shows positive but insignificant result as measured by Consumer Price Index to profitability indicator, ROA. Last but not least bank size was found to be negative but significant associated with bank profitability.

Future studies are recommended to expand the coverage of target samples, as well as conduct comparative analysis with foreign Banks to obtain further understanding from different perspectives. It is also recommended for future studies to improve data collection, and consider qualitative factors to improve the reliability of related industry.

REFERENCES

Aaron, T. Y. & Floros, C. (2012). Bank profitability and inflation: The case of China. *Journal of Economic Studies, 39*(6), 675-696.

Ab Rahim, R. (2015). Ranking of Malaysian commercial banks: Super-efficiency data envelopment analysis (DEA) approach. *Asian Academy of Management Journal of Accounting & Finance*, *11*(1).

Adrian, T., & Ashcraft, A., B. (2015). Shadow Banking Regulation. *Ssrn Electronic Journal, 4*(4), 99-140.

Adusei, M. (2015). Bank profitability: Insights from the rural banking industry in Ghana. *Cogent Econ. Finance, 3*.

Akin, I. (2016). Factors influencing the profitability of EU banks' before and during the financial crisis.

Aladwan, M. S. (2015). The impact of bank size on profitability "An empirical study on listed Jordanian commercial banks". *European Scientific Journal, 11*(34).

Ali, M. (2015). Bank profitability and its determinants in Pakistan: A panel data analysis after financial crisis. *Munich Personal RePEc Archive.*

Alkhazaleh, A. M., & Almsafir, M. (2014). Bank specific determinants of profitability in Jordan. *Journal of Advanced Social Research, 4*(10), 1-20.

Ally, Z. (2014). Determinants of banks' profitability in a developing economy: Empirical evidence from Tanzania. *European Journal of Business and Management, 6*(31).

Almazari, A. A. (2014). Impact of internal factors on bank profitability: Comparative study between Saudi Arabia and Jordan. *Journal of Applied finance and banking*, *4*(1), 125.

Alshatti, A. S. (2015). The effect of credit risk management on financial performance of the Jordanian commercial banks. *Investment Management and Financial Innovations, 12*(1), 338-345.

Al-Awawdeh, H., & Al-Sakini, S. (2017). Off-balance items and their impact on the financial performance standards of the banks: An empirical study on the Commercial Banks of Jordan. *International Business and Management, 15*(2), 46-54.

Amadeo, K. (2018). *What is the GDP growth rate?* Retrieved February 27, 2019, from https://www.thebalance.com/what-is-the-gdp-growth-rate-3306016

Anbar, A., & Alper, D. (2011). Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey.

Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2015). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of international financial Markets, Institutions and Money, 18*(2), 121-136.

Ayanda, M. A., Christopher, I., & Mudashiru, A. M. (2013). Determinants of banks' profitability in a developing economy: Evidence from Nigerian banking industry. *Journal of Contemporary Research in Business*, *4*(9), 163-176.

Boateng, K. (2018). Determinants of bank profitability: A comparative study of Indian and Ghanaian banks.

Bolt, W., De Haan, L., Hoeberichts, M., Van Oordt, M. R., & Swank, J. (2012). Bank profitability during recessions. *Journal of Banking & Finance, 36*(9), 2552-2564.

Busch, R., & Kick, T. K. (2015). Income diversification in the German banking industry.

Calmès, C., & Liu, Y. (2015). Financial structure change and banking income: A Canada–US comparison. *Journal of International Financial Markets, Institutions and Money, 19*(1), 128-139.

Calmes, C., & Theoret, R. (2011). The rise of shadow banking and the hidden benefit of diversification. Département des sciences administratives, UQO.

Combey, A., & Togbenou, A. (2017). The bank sector performance and macroeconomics environment: Empirical evidence in Togo. *International Journal of Economics and Finance, 9*(2), 180-188.

Curak, M., Poposki, K. & Pepur, S. (2012). Profitability determinants of the Macedonian banking sector in changing environment. *Procedia - Social and Behavioral Sciences, 44*(5), 406-416.

Dawood, U. (2014). Factors impacting profitability of commercial banks in Pakistan for the period of (2009-2012). *International Journal of Scientific and Research Publications, 4*(3), 1-7.

Demirgüç-Kunt, A., & Huizinga, H. (2015). Financial structure and bank profitability.

Duraj, B., & Moci, E. (2015). Factors influencing the bank profitability: Empirical evidence from Albania. *Asian Economic and Financial Review, 5*(3), 483-494.

Ebenezer. O. O., Omar. W. A., Kamil. S. (2017). Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Nigeria. *Journal of Finance & Banking Studies 6*(1), 25-38.

Ebenezer, O. O., & Omar, W. A. W. (2016). The empirical effects of credit risk on profitability of commercial banks: Evidence from Nigeria. *International Journal of Science and Research, 5*(8), 1645-1650.

Edison, H., & Reinhart, C. (2015). Capital controls during financial crises: the case of Malaysia and Thailand.

Ekinci, A. (2016). The effect of credit and market risk on bank performance: Evidence from Turkey. *International Journal of Economics and Financial Issues, 6*(2), 427-434.

Gennaioli, N. (2015). A model of shadow banking. *Journal of Finance, 68*(4).

Ghasemi, A., & Zahediasl, S. (2012). Normality tests for statistical analysis: A guide for non-statisticians. *International Journal of Endocrinology Metabolism, 10*(2), 486-489.

Ghazali, N. A. M., & Weetman, P. (2016). Perpetuating traditional influences: Voluntary disclosure in Malaysia following the economic crisis. *Journal of International Accounting, Auditing and Taxation, 15*(2), 226-248.

Hirtle, B. J., & Stiroh, K. J. (2015). The return to retail and the performance of US banks. *Journal of Banking & Finance, 31*(4), 1101-1133.

Hooshyari, N. & Moghanloo, A. P. (2015). Evaluating the impact of inflation on profitability of banks. *Kuwait Chapter of Arabian Journal of Business and Management Review, 4*(9), 19-23.

Isanzu, J. S. (2017). The impact of credit risk on the financial performance of Chinese banks. *Journal of International Business Research and Marketing, 2*(3), 14-17.

Karim, M., Abd, Z., & Gee, C. S. (2015). Off-balance sheet activities and performance of commercial banks in Malaysia. *ICFAI Journal of Financial Economics, 5*(4).

Khan, W. A., Shahid, M., Bari, R., Anam, W., Shehzad, N. & Siddique, S. (2014). Impacts of inflationary trends on banks' performance (Large Banks Segment) in Pakistan. *International Journal of Accounting and Financial Reporting, 4*, 296-306.

Khoon, G. S., & Lim (Mah-Hui.). (2010). *The impact of the global financial crisis: The case of Malaysia*. Third World network (TWN).

Khrawish, H. A. (2011). Determinants of commercial banks performance: Evidence from Jordan. *International Research Journal of Finance and Economics, 81*, 148-159.

Kiganda, E. O. (2014). Effect of macroeconomic factors on commercial banks profitability in Kenya: Case of equity bank limited. *Journal of Economics and Sustainable Development, 5*(2), 46-56.

Kutum, I. (2017). The impact of credit risk on the profitability of banks listed on the Palestine exchange. *Research Journal of Finance and Accounting, 8*(8), 136-141.

Mbekomize, C. J., & Mapharing, M. (2017). Analysis of determinants of profitability of commercial banks in Botswana. *International Journal of Academic Research in Accounting, Finance and Management Sciences. (7)*2, 131–144.

Meeks, R., Nelson, B., & Alessandri, P. (2014). Shadow banks and macroeconomic instability. *SSRN Electronic Journal.*

Mercieca, S., Schaeck, K., & Wolfe, S. (2015). Small European banks: Benefits from diversification? *Journal of Banking & Finance, 31*(7), 1975-1998.

Menicucci, E., & Paolucci, G. (2016). Factors affecting bank profitability in Europe: An empirical investigation. *African Journal of Business Management, 10*(17), 410-420.

Minghui, J., & Xin'ge, Z. (2018, December). Research on the influencing factors and paths of non-performing loan ratio of rural commercial banks in China qualitative research and investigation based on grounded theory. In *4th International Conference on Economics, Management, Law and Education (EMLE 2018)*. Atlantis Press.

Mndeme, R. K. (2015). Impact of non-interest income on banking performance in Tanzania. *International Journal of Economics, Commerce and Management, 3*(5), 75- 92.

Mulwa, J. M., Tarus, D., & Kosgei, D. (2015). Commercial bank diversification: A theoretical survey. *International Journal of Research in Management & Business Studies, 2*(1), 31-52.

Muriithi, J. G., Waweru, K. M., & Muturi, W. M. (2016). Effect of credit risk on financial performance of commercial banks Kenya. *Journal of Economics and Finance, 7*(4), 72-83.

Noman, A. H. M., Pervin, S., Chowdhury, M. M., & Banna, H. (2015). The effect of credit risk on the banking profitability: A case on Bangladesh. *Global Journal of Management and Business Research, 15*(3), 41-48.

Nshimiyimana, Y. C., & Zubeda, M. A. (2017). The influence of economic factors on profitability of commercial banks. *International Journal of Management and Applied Science, 3*, 14-18.

Nwakuya, M. T., & Ijomah, M. A. (2017). Fixed effect versus random effects modelling in a panel data analysis; a consideration of economic and political indicators in six African countries. *International Journal of Statistics and Applications, 7*(6), 275-279.

Obamuyi, T. M. (2013). Determinants of banks' profitability in a developing economy: Evidence from Nigeria. *Organizations and Markets in Emerging Economies, 2*, 97- 111.

Olalekan, L. I., Olumide, M. L., & Irom, I. M. (2018). Financial risk management and theprofitability: An empirical evidence from commercial banks in Nigeria. *Sahel Analyst: Journal of Management Sciences, 16*(2), 117-137.

Ong. T. S., & Teh. B. H. (2013). Factors affecting the profitability of Malaysian commercial banks. *African Journal of Business Management (7)*8, 649-660.

Panta, B. (2018). Non-performing loans & bank profitability: Study of joint venture banks in Nepal. *International Journal of Sciences: Basic and Applied Research, 42*(1), 151-165.

Petria, N., Capraru, B., & Ihnatov, I. (2015). Determinants of banks' profitability: Evidence from EU 27 banking systems. *Procedia Economics and Finance, 20*, 518-524.

Poudel, S. R. (2018). Impact of credit risk on profitability of commercial banks in Nepal. *Journal of Applied and Advanced Research, 3*(6), 161-170.

Rabiul, I., Ahmad, B. A. G., Emil, M., & Narmatha, M. (2017). Determinants of factors that affecting inflation in Malaysia. *International Journal of Economics and Financial Issues, 7*(2), 355-364.

San, O. T., & Heng, T. B. (2013). Factors affecting the profitability of Malaysian commercial banks. *African Journal of Business Management*, *7*(8), 649-660.

Saeed, M. S., & Zahid, N. (2016). The impact of credit risk on profitability of the commercial banks. *Journal of Business & Financial Affairs*, *5*(2), 1-7.

Saeed, M. S. (2014). Bank-related, industry-related and macroeconomic factors affecting bank profitability: A case of the United Kingdom. *Research journal of finance and accounting*, *5*(2), 42-50.

Samad, A. (2015). Determinants bank profitability: Empirical evidence from Bangladesh commercial banks. *International journal of financial research*, *6*(3), 173.

Saksonova, S., & Koleda, O. (2017). Evaluating the interrelationship between actions of Latvian commercial banks and Latvian economic growth. *Procedia Engineering*, *178*, 123-130.

Schwarcz, S. L. (2012). Regulating shadow banking. *Review of Banking and Financial Law*, *31*, 619-642.

Scott, A. O., & Ovuefeyen, E. J. (2014). Effects of economic openness and inflation on commercial banks' profitability: Panel data evidence from Nigeria, post banking sector consolidation. *European Journal of Business and Management*, *6*(30), 87-96.

Sehrish, G., Irshad, F., & Zaman, K. (2011). Factors affecting bank profitability in Pakistan. *The Romanian Economic Journal, 39*, 61-87.

Sheefeni, J. P. (2015). The macroeconomic determinants of profitability among commercial banks in Namibia. *Journal of Emerging Issues in Economics, Finance and Banking. (4)*1, 1414-1431.

Sufian, F. (2009). Factors influencing bank profitability in a developing economy. Empirical Evidence from Malaysia. *Global Business Review, 10*(2), 225-241.

Sundaram, J. K. (2016). Pathways through financial crisis: Malaysia. *Global Governance: A Review of Multilateralism and International Organizations*, *12*(4), 489-505.

Swain, A. K., & Panda, G. P. (2017). Off balance sheet exposure of public sector banks in India: An empirical analysis. *Imperial Journal of Interdisciplinary Research*, *3*(2), 182-191.

Tang, J.Y. & Wang, Y.L. (2016). Effects of shadow banking on return — Empirical study based on Chinese commercial banks. *International Journal of Financial Research, 7*(1), 207-218.

Tan, Y., & Floros, C. (2014). Bank profitability and GDP growth in China: a note. *Journal of Chinese Economic and Business Studies*, *10*(3), 267-273.

Tan, Y. (2016). The impacts of risk and competition on bank profitability in China. *Int. Fin. Markets, Inst. and Money, 40,* 85-110.

Tang, J., & Wang, Y. (2015). Effects of shadow banking on return—Empirical study based on Chinese commercial banks. *International Journal of Financial Research, 7*(1), 207.

Tariq, W., Usman, M., Mir, H. Z., Aman, I., & Ali, I. (2014). Determinants of commercial banks profitability: Empirical evidence from Pakistan. *International Journal of Accounting and Financial Reporting, 4*(2), 1-22.

Topak, M. S. & Talu, N. H. (2017). Bank specific and macroeconomic determinants of bank profitability: Evidence from Turkey. *International Journal of Economics and Financial Issues, 7*(2), 574-584.

Trofimov, I. D., Ying, Y., & Kho, J. (2018). Determinants of commercial banks' profitability in Malaysia.

Umar, M., Maijama'a, D., & Adamu, M. (2014). Conceptual exposition of the effect of inflation on bank performance. *Journal of World Economic Research, 3*(5), 55-59.

Vejzagic, M., & Zarafa, H. (2014). An analysis of macroeconomic determinants of commercial banks profitability in Malaysia for the period 1995-2011. *Asian Economic and Financial Review, 4*(1), 41-57.

Veizi, Z., Mano, R., & Kociu, L. (2016). The effect of credit risk on the banking profitability: A case on Albania. *International Journal of Economics, Commerce and Management, 4*(7), 386-394.

Vejzagic, M., & Zarafa, H. (2014). An analysis of macroeconomic determinants of commercial banks profitability in Malaysia for the period 1995-2011. *Asian Economic and Financial Review*, *4*(1), 41-57.

Weersainghe, V. E. I. W., & Perera, T. R. (2013). Determinants of profitability of commercial banks in Sri Lanka central bank of Sri Lanka. *International Journal of Arts and Commerce*, *2*(10), 141-170.

Williams, B. (2016). The impact of non-interest income on bank risk in Australia. *Journal of Banking & Finance*, *73*, 16-37.

Yang, J., Kolari, J. W., & Min, I. (2003). Stock market integration and financial crises: The case of Asia. *Applied Financial Economics*, *13*(7), 477-486.

Yakubu, I. N. (2016). Bank-specific and macroeconomic determinants of commercial banks profitability in Ghana. *International Finance and Banking*, *3*(2).

Yao, H. X., Haris, M., & Tariq, G. (2018). Profitability determinants of financial institutions: Evidence from banks in Pakistan. *International Journal of Financial Studies*, *6*(53), 1-28.

Zolkifli, N. A., Uda, M. A. H., & Janor, H. (2018). Determinants of credit risk in Islamic and conventional bank: Evidence from Malaysia. *International Journal of Academic Research in Business and Social Sciences*, *8*(6), 1054-1068.

APPENDICES

Appendix 1.1 Raw data for dependent and independent variables for eight local commercial banks in Malaysia during 2003-2017.

YEAR	BANK	ROA	LOG BANK SIZE	CREDIT RISK
2003	Public Bank	0.01060	11.02000	0.01742
2004		0.01110	11.05000	0.01326
2005		0.01160	11.09000	0.01872
2006		0.01210	11.17000	0.01906
2007		0.01260	11.24000	0.01409
2008		0.01340	11.29000	0.01022
2009		0.01180	11.37000	0.01400
2010		0.01370	11.35000	0.01100
2011		0.01410	11.39000	0.00900
2012		0.01420	11.43000	0.00700
2013		0.01340	11.48000	0.00700
2014		0.01320	11.53000	0.00600
2015		0.01408	11.56000	0.00500
2016		0.01386	11.57000	0.00500
2017		0.01403	11.59000	0.00500
2003	Maybank	0.01240	11.20670	0.12720
2004		0.01351	11.25410	0.06188
2005		0.01304	11.28310	0.05073
2006		0.01264	11.35000	0.03957
2007		0.01267	11.41000	0.03111
2008		0.01116	11.42000	0.01968

2009		0.00242	11.49000	0.01540
2010		0.01179	11.52000	0.01129
2011		0.01121	11.61000	0.02057
2012		0.01196	11.69000	0.01099
2013		0.01208	10.74000	0.00848
2014		0.01079	11.81000	0.01052
2015		0.00986	11.85000	0.01388
2016		0.00946	11.87000	0.01526
2017		0.01019	11.88000	0.01530
2003	Hong Leong Bank	0.01333	10.63920	0.06200
2004		0.00779	10.69070	0.05400
2005		0.00902	10.76060	0.04500
2006		0.00908	9.79000	0.03100
2007		0.00867	10.85000	0.01900
2008		0.00958	10.88000	0.01400
2009		0.01139	10.89000	0.01300
2010		0.01166	10.93000	0.01200
2011		0.00780	11.16000	0.01161
2012		0.01042	11.20000	0.00512
2013		0.01135	11.21000	0.00393
2014		0.01234	11.23000	0.00367
2015		0.01214	11.26000	0.00337
2016		0.01003	11.27000	0.00367
2017		0.01097	11.29000	0.00534
2003	CIMB Bank	0.00800	10.99090	0.05490

2004		0.00670	11.04910	0.06850
2005		0.00730	11.05510	0.05790
2006		0.00960	11.20000	0.05490
2007		0.01530	11.26000	0.03850
2008		0.00940	11.32000	0.04940
2009		0.01170	11.38000	0.04980
2010		0.01300	11.43000	0.06140
2011		0.01340	11.48000	0.05110
2012		0.01370	11.53000	0.03800
2013		0.01280	11.57000	0.03200
2014		0.00790	11.62000	0.03100
2015		0.00650	11.66000	0.03000
2016		0.00750	11.69000	0.03300
2017		0.00900	11.70000	0.03400
2003	Ambank	0.00450	10.77000	0.11460
2004		0.00360	10.78000	0.17910
2005		0.00330	10.79000	0.13840
2006		0.05058	10.86000	0.09600
2007		-0.00064	10.90000	0.06200
2008		0.00975	10.92000	0.03700
2009		0.00977	10.95000	0.02600
2010		0.01081	10.98000	0.01500
2011		0.01285	11.03000	0.03300
2012		0.01400	11.05000	0.02500
2013		0.01333	11.10000	0.02000
2014		0.01414	11.12000	0.01900

2015		0.01528	11.13000	0.01800
2016		0.01046	11.13000	0.01900
2017		0.01045	11.13000	0.01860
2003	RHB Bank	0.00538	10.91450	0.06066
2004		0.00351	10.95380	0.05214
2005		0.00456	10.97000	0.05630
2006		0.00530	10.98000	0.04591
2007		0.00796	10.97000	0.03409
2008		0.01094	10.98000	0.02263
2009		0.01120	11.03000	0.04858
2010		0.01194	11.08000	0.04503
2011		0.01090	11.16000	0.03524
2012		0.01005	10.28000	0.00300
2013		0.00965	11.28000	0.02800
2014		0.00941	11.34000	0.02000
2015		0.00661	11.36000	0.01900
2016		0.00713	11.37000	0.01180
2017		0.00850	11.36000	0.01190
2003	Affin Bank	0.00150	10.54850	0.01960
2004		0.00701	10.51650	0.01910
2005		0.00760	10.49390	0.14230
2006		0.00640	10.55000	0.12050
2007		0.00680	10.57000	0.07890
2008		0.00790	10.57000	0.03200
2009		0.00930	10.60000	0.02200
2010		0.01040	10.67000	0.03660

2011		0.00950	10.73000	0.02860
2012		0.01126	10.75000	0.01620
2013		0.01084	10.78000	0.00920
2014		0.00918	10.82000	0.00840
2015		0.00567	10.82000	0.01020
2016		0.00963	10.83000	0.01080
2017		0.00606	10.85000	0.02550
2003	Alliance Bank	0.00830	10.30540	0.10800
2004		0.00870	10.37000	0.09700
2005		0.00910	10.37000	0.08000
2006		0.04553	10.40000	0.04200
2007		0.05526	10.42000	0.05670
2008		0.01373	10.44000	0.00243
2009		0.00072	10.50000	0.01800
2010		0.00952	10.50000	0.01800
2011		0.01136	10.55000	0.03300
2012		0.01386	10.59000	0.02400
2013		0.01194	10.64000	0.02100
2014		0.00947	10.68000	0.01400
2015		0.00959	10.72000	0.01000
2016		0.00935	10.75000	0.01300
2017		0.00947	10.73000	0.01000

YEAR	BANK	GDP GROWTH	INFLATION	SHADOW BANKING
2003	Public Bank	0.05800	0.01100	0.06890
2004		0.06800	0.01400	0.07563
2005		0.05300	0.03000	0.08423
2006		0.05600	0.03600	0.09860
2007		0.09400	0.02000	0.10660
2008		0.03300	0.05400	0.09280
2009		-0.02500	0.00600	0.10580
2010		0.06900	0.03200	0.09340
2011		0.05300	0.01700	0.08770
2012		0.05500	0.03200	0.08290
2013		0.04700	0.02100	0.08360
2014		0.06000	0.03100	0.08190
2015		0.05000	0.02100	0.08090
2016		0.04200	0.02100	0.11390
2017		0.05900	0.03800	0.12280
2003	Maybank	0.05800	0.01100	0.08123
2004		0.06800	0.01400	0.09822
2005		0.05300	0.03000	0.10320
2006		0.05600	0.03600	0.10450
2007		0.09400	0.02000	0.10880
2008		0.03300	0.05400	0.10990
2009		-0.02500	0.00600	0.11700
2010		0.06900	0.03200	0.14050
2011		0.05300	0.01700	0.12690

2012		0.05500	0.03200	0.13020
2013		0.04700	0.02100	0.10660
2014		0.06000	0.03100	0.10390
2015		0.05000	0.02100	0.09420
2016		0.04200	0.02100	0.08170
2017		0.05900	0.03800	0.07820
2003	Hong Leong Bank	0.05800	0.01100	0.11708
2004		0.06800	0.01400	0.00278
2005		0.05300	0.03000	0.00258
2006		0.05600	0.03600	0.17893
2007		0.09400	0.02000	0.16897
2008		0.03300	0.05400	0.16192
2009		-0.02500	0.00600	0.14237
2010		0.06900	0.03200	0.14623
2011		0.05300	0.01700	0.15072
2012		0.05500	0.03200	0.15320
2013		0.04700	0.02100	0.14775
2014		0.06000	0.03100	0.14727
2015		0.05000	0.02100	0.14771
2016		0.04200	0.02100	0.14762
2017		0.05900	0.03800	0.14979
2003	CIMB Bank	0.05800	0.01100	0.58940
2004		0.06800	0.01400	0.52080
2005		0.05300	0.03000	0.49600
2006		0.05600	0.03600	0.35900

2007		0.09400	0.02000	0.26800
2008		0.03300	0.05400	0.11180
2009		-0.02500	0.00600	0.13130
2010		0.06900	0.03200	0.10690
2011		0.05300	0.01700	0.09110
2012		0.05500	0.03200	0.10080
2013		0.04700	0.02100	0.09850
2014		0.06000	0.03100	0.09610
2015		0.05000	0.02100	0.09090
2016		0.04200	0.02100	0.50590
2017		0.05900	0.03800	0.50050
2003	Ambank	0.05800	0.01100	0.08962
2004		0.06800	0.01400	0.08563
2005		0.05300	0.03000	0.07890
2006		0.05600	0.03600	0.07563
2007		0.09400	0.02000	0.07156
2008		0.03300	0.05400	0.06723
2009		-0.02500	0.00600	0.05220
2010		0.06900	0.03200	0.05361
2011		0.05300	0.01700	0.05697
2012		0.05500	0.03200	0.05121
2013		0.04700	0.02100	0.05141
2014		0.06000	0.03100	0.44440
2015		0.05000	0.02100	0.04727
2016		0.04200	0.02100	0.04579
2017		0.05900	0.03800	0.04628

2003	RHB Bank	0.05800	0.01100	0.11080
2004		0.06800	0.01400	0.09942
2005		0.05300	0.03000	0.08795
2006		0.05600	0.03600	0.07596
2007		0.09400	0.02000	0.08638
2008		0.03300	0.05400	0.08660
2009		-0.02500	0.00600	0.09510
2010		0.06900	0.03200	0.09010
2011		0.05300	0.01700	0.08020
2012		0.05500	0.03200	0.08290
2013		0.04700	0.02100	0.08350
2014		0.06000	0.03100	0.08190
2015		0.05000	0.02100	0.08090
2016		0.04200	0.02100	0.11390
2017		0.05900	0.03800	0.12280
2003	Affin Bank	0.05800	0.01100	0.07467
2004		0.06800	0.01400	0.08095
2005		0.05300	0.03000	0.10380
2006		0.05600	0.03600	0.09870
2007		0.09400	0.02000	0.08763
2008		0.03300	0.05400	0.07860
2009		-0.02500	0.00600	0.08640
2010		0.06900	0.03200	0.08080
2011		0.05300	0.01700	0.07290
2012		0.05500	0.03200	0.07185
2013		0.04700	0.02100	0.07566

2014		0.06000	0.03100	0.29147
2015		0.05000	0.02100	0.25535
2016		0.04200	0.02100	0.05495
2017		0.05900	0.03800	0.13601
2003	Alliance Bank	0.05800	0.01100	0.70930
2004		0.06800	0.01400	0.89520
2005		0.05300	0.03000	0.98330
2006		0.05600	0.03600	0.11533
2007		0.09400	0.02000	0.97530
2008		0.03300	0.05400	0.12740
2009		-0.02500	0.00600	0.10897
2010		0.06900	0.03200	0.08630
2011		0.05300	0.01700	0.10860
2012		0.05500	0.03200	0.11670
2013		0.04700	0.02100	0.10880
2014		0.06000	0.03100	0.16350
2015		0.05000	0.02100	0.14840
2016		0.04200	0.02100	0.12910
2017		0.05900	0.03800	0.13640

Appendix 1.2 Pooled OLS Model

Dependent Variable: ROA
Method: Panel Least Squares
Date: 01/21/19 Time: 13:49
Sample: 2003 2017
Periods included: 15
Cross-sections included: 8
Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG_BANK_SIZE	-3.18E-16	1.65E-15	-0.192679	0.8477
CREDIT_RISK	-0.006143	0.021717	-0.282874	0.7781
GDP_GROWTH	0.026760	0.012933	2.069186	0.0420
INFLATION	0.005240	0.025311	0.207035	0.8366
SHADOW_BANKING	2.50E-13	1.21E-13	2.067703	0.0422
C	0.009037	0.000928	9.734369	0.0000

R-squared	0.134288	Mean dependent var	0.010690
Adjusted R-squared	0.075794	S.D. dependent var	0.002601
S.E. of regression	0.002500	Akaike info criterion	-9.072682
Sum squared resid	0.000463	Schwarz criterion	-8.894030
Log likelihood	368.9073	Hannan-Quinn criter.	-9.001056
F-statistic	2.295754	Durbin-Watson stat	1.171992
Prob(F-statistic)	0.053749		

Appendix 1.3 FEM Model

Dependent Variable: ROA?
Method: Pooled Least Squares
Date: 01/21/19 Time: 14:18
Sample: 2003 2017
Included observations: 15
Cross-sections included: 8
Total pool (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.007326	0.001498	4.890399	0.0000
LOG_BANK_SIZE?	-7.02E-15	3.82E-15	-1.837193	0.0707
CREDIT_RISK?	0.065708	0.031620	2.078012	0.0416
GDP_GROWTH?	0.034046	0.011664	2.918979	0.0048
INFLATION?	0.000957	0.021900	0.043695	0.9653
SHADOW_BANKING?	9.93E-13	5.34E-13	1.858283	0.0676
Fixed Effects (Cross)				
_AFFIN--C	-0.001034			
_ALL--C	4.89E-05			
_AMBANK--C	-0.005098			
_CIMB--C	-0.000626			
_HL--C	0.001938			
_MAYBANK--C	0.000900			
_PUBLIC--C	0.004843			
_RHB--C	-0.001035			

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.557752	Mean dependent var	0.010663
Adjusted R-squared	0.523678	S.D. dependent var	0.002606
S.E. of regression	0.002087	Akaike info criterion	-9.357291
Sum squared resid	0.000287	Schwarz criterion	-8.967382
Log likelihood	382.6130	Hannan-Quinn criter.	-9.201082
F-statistic	4.642962	Durbin-Watson stat	1.987685
Prob(F-statistic)	0.000020		

Appendix 1.4 Result of Poolibility Hypothesis Test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.392891	(7,67)	0.0001
Cross-section Chi-square	35.750897	7	0.0000

Cross-section fixed effects test equation:
Dependent Variable: ROA
Method: Panel Least Squares
Date: 01/21/19 Time: 15:39
Sample: 2003 2017
Periods included: 15
Cross-sections included: 8
Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG BANK SIZE	-3.18E-16	1.65E-15	-0.192679	0.8477
CREDIT RISK	-0.006143	0.021717	-0.282874	0.7781
GDP_GROWTH	0.026760	0.012933	2.069186	0.0420
INFLATION	0.005240	0.025311	0.207035	0.8366
SHADOW BANKING	2.50E-13	1.21E-13	2.067703	0.0422
C	0.009037	0.000928	9.734369	0.0000

R-squared	0.134288	Mean dependent var	0.010690
Adjusted R-squared	0.075794	S.D. dependent var	0.002601
S.E. of regression	0.002500	Akaike info criterion	-9.072682
Sum squared resid	0.000463	Schwarz criterion	-8.894030
Log likelihood	368.9073	Hannan-Quinn criter.	-9.001056
F-statistic	2.295754	Durbin-Watson stat	1.171992
Prob(F-statistic)	0.053749		

Appendix 1.5 Result of Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	9.85463156	5	0.04751

* Cross-section test variance is invalid. Hausman statistic set to zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LOG_BANK_SIZE	-0.000000	-0.000000	0.000000	0.1292
CREDIT_RISK	0.059599	0.035167	0.000310	0.1651
GDP_GROWTH	0.034688	0.032977	0.000011	0.6099
INFLATION	-0.001572	0.000268	0.000018	0.6686
SHADOW_BANKING	0.000000	0.000000	0.000000	0.1744

Cross-section random effects test equation:
Dependent Variable: ROA
Method: Panel Least Squares
Date: 01/21/19 Time: 15:06
Sample: 2003 2017
Periods included: 15
Cross-sections included: 8
Total panel (balanced) observations: 120

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.007596	0.001503	5.052749	0.0000
LOG BANK SIZE	-7.20E-15	3.85E-15	-1.873613	0.0653
CREDIT_RISK	0.059599	0.031545	1.889302	0.0632
GDP GROWTH	0.034688	0.011739	2.954955	0.0043
INFLATION	-0.001572	0.021983	-0.071533	0.9432
SHADOW BANKING	9.73E-13	5.38E-13	1.809052	0.0749

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.446276	Mean dependent var	0.010690
Adjusted R-squared	0.347102	S.D. dependent var	0.002601
S.E. of regression	0.002102	Akaike info criterion	-9.344569
Sum squared resid	0.000296	Schwarz criterion	-8.957489
Log likelihood	386.7827	Hannan-Quinn criter.	-9.189377
F-statistic	4.499912	Durbin-Watson stat	1.972232
Prob(F-statistic)	0.000029		

Appendix 1.6 Multicollinearity: Correlation between Each Independent Variables and Dependent Variable

Correlation	LOG BANK SIZE	CREDIT RISK	GDP GROWTH	INFLATION	SHADOW BANKING
LOG BANK SIZE	1.000000	-	-	-	-
CREDIT RISK	-0.044743	1.000000	-	-	-
GDP GROWTH	0.144667	-0.137924	1.000000	-	-
INFLATION	-0.032783	-0.041369	0.457194	1.000000	-
SHADOW BANKING	0.188502	0.086998	0.077899	-0.005392	1.000000

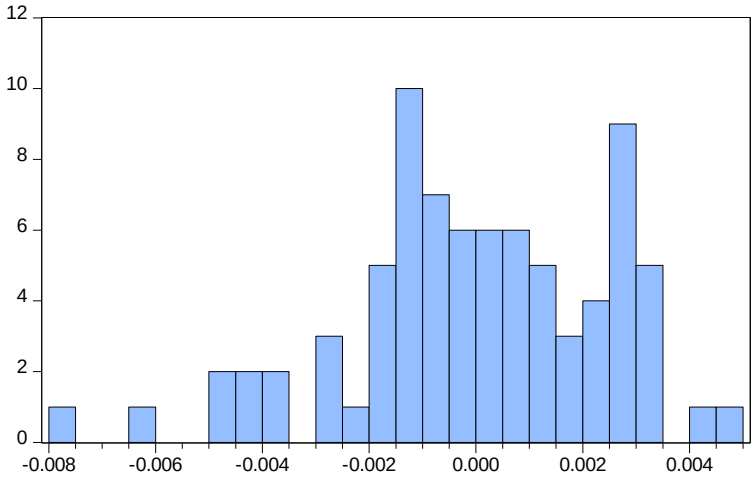
Appendix 1.7 Result of Unit Root Test

Pool unit root test: Summary
Series: ROA_AFFIN, ROA_ALL, ROA_AMBANK, ROA_CIMB, ROA_HL, ROA_MAYBANK, ROA_PUBLIC, ROA_RHB, BS_AFFIN, BS_ALL, BS_AMBANK, BS_CIMB, BS_HL, BS_MAYBANK, BS_PUBLIC, BS_RHB, CR_AFFIN, CR_ALL, CR_AMBANK, CR_CIMB, CR_HL, CR_MAYBANK, CR_PUBLIC, CR_RHB, GDP_AFFIN, GDP_ALL, GDP_AMBANK, GDP_CIMB, GDP_HL, GDP_MAYBANK, GDP_PUBLIC, GDP_RHB, INF_AFFIN, INF_ALL, INF_AMBANK, INF_CIMB, INF_HL, INF_MAYBANK, INF_PUBLIC, INF_RHB, NON_II_AFFIN, NON_II_ALL, NON_II_AMBANK, NON_II_CIMB, NON_II_HL, NON_II_MAYBANK, NON_II_PUBLIC, NON_II_RHB
Date: 01/21/19 Time: 14:50
Sample: 2003 2017
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.43537	0.0000	48	426
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-10.6350	0.0000	48	426
ADF - Fisher Chi-square	292.026	0.0000	48	426
PP - Fisher Chi-square	301.354	0.0000	48	430

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Appendix 1.8 Result of Normality Test



Series: Standardized Residuals
Sample 2003 2017
Observations 120

Mean	4.34e-20
Median	1.65e-07
Maximum	0.004881
Minimum	-0.007768
Std. Dev.	0.002444
Skewness	-0.593383
Kurtosis	3.427593
Jarque-Bera	5.304168
Probability	0.070504