## ECONOMIC FACTORS AFFECTING PERFORMANCE OF FOREIGN BANKS IN MALAYSIA

BY

CHIN SAU LING GAN HUAN YING HENG KHAI LING LIM PICK KUAN SOO JI YEAN

A research project submitted in partial fulfillment of the requirement for the degree of

#### BACHELOR OF BUSINESS ADMINISTRATION (HONS) BANKING AND FINANCE

#### UNIVERSITI TUNKU ABDUL RAHMAN

#### FACULTY OF BUSINESS AND FINANCE DEPARTMENT OF FINANCE

APRIL 2013

Copyright @ 2013

ALL RIGHTS RESERVED. No part of this paper may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, graphic, electronic, mechanical, photocopying, recording, scanning, or otherwise, without the prior consent of the authors.

Group 40

#### DECLARATION

We hereby declare that:

- (1) This undergraduate research project is the end result of our own work and that sue 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 12, 682 words.

Name of Students:		Student ID:	Signature:
1.	Chin Sau Ling	09ABB03979	
2.	Gan Huan Ying	10ABB06999	
3.	Heng Khai Ling	09ABB03699	
4.	Lim Pick Kuan	09ABB09054	
5.	Soo Ji Yean	09ABB03468	

Date: \_\_\_\_\_

#### ACKNOWLEDGEMENT

This research project would not have been possible to complete without the support of many people. We would like to take this opportunity to thank everyone who has helped and guided us in completing our research project.

First and foremost, we would like to thank to our supervisor of this project, Mr. William Choo for the valuable guidance and advice. We would like to thank him for his willingness to inspire and motivate us in our project. We are grateful to has him as our supervisor as he always stood by us and sacrificed his valuable time for helping us when we were in need for assistance.

Second, we would like to thank to Universiti Tunku Abdul Rahman (UTAR) for offering this subject. It has given us an opportunity to participate and learn, hence, gain more experience in conducting a research.

Besides, we would like to thank all of our group members for our hard work and teamwork in completing this research project. The effort that everyone has put can be seen from our quality and valuable project. Moreover, we had developed a deeper friendship during this period.

Lastly, we would like to express our love to our families and friends for their understanding and supporting which has lead to the completion of this research project. Without their helps and understanding love, we would face many difficulties while doing this project.

#### TABLE OF CONTENTS

Copyright Page.		Page
Declaration		iii
Acknowledgeme	ent	iv
Table of Content	ts	V
List of Tables		viii
List of Figures		ix
List of Abbrevia	tions	X
List of Appendic	ces	xii
Preface		xiii
Abstract		xiv
CHAPTER 1	INTRODUCTION	1
1.1	Research Background	1
1.2	Problem Statement	3
1.3	Research Objectives	5
	1.3.1 General Objectives	5
	1.3.2 Specific Objectives	5
1.4	Research Questions	6

1.5	Hypothe	eses of the Stu	dy	7
1.6	Signific	ance of the Stu	ıdy	10
1.7	Chapter	Layout		11
1.8	Conclus	ion		12
CHAPTER 2	LITERA	ATURE REVI	EW	13
2.1	Review	of the Literatu	ıre	13
2.2	Review	of Relevant T	heoretical Models	21
2.3	Propose	d Theoretical	Conceptual Framework	24
2.4	Hypothe	esis Developm	ent	25
2.5	Conclus	ion		29
CHAPTER 3	METHO	DOLOGY		30
3.1	Researc	h Design		30
3.2	Data Co	llection Metho	ods	31
	3.2.1	Secondary I	Data	32
3.3	Data Ar	alysis		33
	3.3.1	Poolibility H	Typothesis Testing	33
	3.3.2	Hausman Te	est	34
	3.3.3	Diagnostic	Test	35
		3.3.3.1	Normality Test	35
		3.3.3.2	Sensitivity Analysis	36

	3.4	Conclusion	37
CHAPTER 4	DATA A	NALYSIS	38
4.1	Scale of	Measurement	38
	4.1.1	Panel Data Regression	38
	4.1.2	Normality Test	40
	4.1.3	Sensitivity Analysis	40
4.2	Inferentia	al Analysis	43
4.3	Conclusi	on	47
CHAPTER 5	DISCUS	SION, CONCLUSION, AND IMPLICATIONS	49
5.1	Summar	y of Statistical Analysis	49
5.2 Discussion of Major Finding		50	
5.3	5.3 Implication of the Study		51
5.4	Limitatic	on of the Study	53
5.5	Recomm	endation for Future Research	53
5.6	Conclusi	on	54
References			55
Appendices			60

#### LIST OF TABLES

Table 3.1: Definition of the Variables	29
Table 4.1: Regression Results (Dependent Variable = ROA)	38
Table 4.2: Results for Poolibity Hypothesis Test and Hausman Test	39
Table 4.3: Results for Sensitivity Test	42
Table 4.4: Regression results of Fixed Effect Model	43

#### LIST OF FIGURES

Figure 2.1: Proposed Theoretical / Conceptual Framework	
Figure 4.1: Results for Sensitivity Test	42

#### LIST OF ABBREVIATIONS

CEO	Chief Executive Officer
CIR	Cost to Income Ratio
CR	Capital Ratio
CRI	Global Financial Crisis
CRO	Chief Risk officer
FEM	Fixed Effect Model
GDP	Gross Domestic Product
GLS	General Least Squares
GMM	General Method of Moments
INF	Inflation Rate
INT	Interest Rate
JB	Jarque-Bera
LGDP	Logarithm of Real Gross Domestic product
LTA	Logarithm of Total Assets
OLS	Ordinary Least Squares
REM	Random Effect Model
ROA	Return on Assets

UOB

ROE

United Overseas Bank

#### LIST OF APPENDICES

Appendix 1: Results of Pooled OLS Model	60
Appendix 2: Results of Fixed Effect Model	61
Appendix 3: Results of Random Effect Model	62
Appendix 4: Results of Poolibility Hypothesis Testing	63
Appendix 5: Results of Hauman Test	64
Appendix 6: t-distribution Table	66

#### PREFACE

This research paper is the Final Year Project (FYP) or also known as the research methodology and project that is partial fulfillment of the requirement for Bachelor of Business Administrations (Hons) Banking and Finance. This research project is conducted based on the research and other reliable sources as quoted in the reference.

There are a lot of researches and studies on this topic for the local commercial banks but there none of it doing studies about the variables that affects the performance of foreign banks in Malaysia. We are interested to know how the foreign banks perform in Malaysia and therefore, the title we choose for this research project is 'Economic Factors Affecting Performance of Foreign Banks in Malaysia'. This research has to be accomplished within 28 weeks.

We faced difficulty when conducting this research but we are glad because we have learned how to deal with the problems and think ways to solve it. We built good relationship and teamwork among group mates when overcome the circumstances together. From this research, we have gained more knowledge in banking field and we believe this research could bring us benefits in our future career.

#### ABSTRACT

This paper is aim to investigate the economic factors that affect the performance of foreign banks in Malaysia from year 2005 until 2010. 8 foreign banks in Malaysia are selected based on their average total assets, which are HSBC bank, OCBC bank, Standard Chartered bank, Citibank, UOB bank, Deutsche bank, Bank of Tokyo Mitsubishi UFJ and Royal Bank of Scotland. ROA is chosen as the dependent variable to measure the performance of the foreign banks. There are 7 independent variables which we categorized the variables as microeconomic factors and macroeconomic factors. Microeconomic factors include bank size, capital ratio and cost to income ratio while macroeconomic factors include real GDP, real interest rate, inflation and global financial crisis.

This empirical analysis is carried out by using yearly data and employs the short balanced panel data. The regression results obtained from Fixed Effect Model (FEM) found that the bank size, cost to income ratio and real GDP have significant effect while the capital ratio, real interest rate, inflation and global financial crisis have no significant effect on the performance of foreign banks in Malaysia.

# **CHAPTER 1: RESEARCH OVERVIEW**

# **1.0 Introduction**

The aim of this study is to investigate the economic factors that will affect the performance of foreign banks in Malaysia. In this extent, the main idea and the overall context of this study will be explained in this chapter by providing the background of research, problem statement, research objectives which consist of general objective and specific objectives, research questions. The hypothesis of the study, significance of the study and chapter layout also present in this chapter.

# 1.1 Research Background

Throughout the banking history, bank acts as an important role in the financial system. Bank issues demand deposits, which economists believe that this is a way of turning illiquid assets into liquid assets (Diamond & Dybvig, 1983). Bank also improves society living standards by producing various products and services to the market such as trading activities, channeling of financial resources between savers and borrowers and issuing product to reduce risk and uncertainty.

Globalization has encouraged the internationalization of banking system and thus many banks expand their operations to foreign country. In Malaysia, the entry of foreign banks increases intensively since the early 1980s where the internalization of banking system started (Detragiache & Gupta, 2006). The presence of foreign banks arouse whether foreign banks will affect the performance of domestic banks. Chan and Karim (2011) argue that domestic banks will become more efficient through competition with foreign banks. Therefore, banks can provide a better quality services

to the market and thus help to improve the economic condition to attract foreign investment in the country.

In the past, the participation of foreign banks was small due to the policy of central bank that gives protection to the domestic banks in order to protect their advantages. Thus, domestic banks are able to compete with the foreign banks.

In Malaysia, the banking system is the main component in the financial system which it holds around 70 percent of total assets in the financial system (Said & Tumin, 2011). The banks in Malaysia can be categorized into 3 main types: commercial banks, investment banks and Islamic banks (Ong, Lim & Teh, 2011). These 3 types of banks are undergoing with different operations. However, commercial banks are the largest banks and they provide most funds in the banking system. Therefore, commercial banks play very important role in Malaysia banking system.

Over the years, the number of commercial banks increases due to the developing of banking industry. After consolidation program of Bank Negara Malaysia after financial crisis in 1997, there are 25 commercial banks which consist of 8 domestic banks and 17 foreign banks in Malaysia (Ong, Lim, & Teh, 2011).

It is essential to measure a bank's performance which can help the bank to identify the market condition as well as to make wise decision in order to cope with uncertainty. This is because when a bank's performance is poor, it may lead to have a great impact on the economy.

In order to examine the bank performance, it can be determined by reviewing its profitability in terms of return on assets (ROA) and/or return on equity (ROE). ROA is expressed as a percentage which calculated by dividing a bank's net income by its total assets. It indicates how profitable a bank generates its revenue. In this study, ROA is being used as a key indicator to measure the profitability of a bank.

The determinants of a bank's profitability can be categorized into two components: internal and external factor. Internal factor sometimes is defined as the microeconomic factor or bank-specific determinants. There are various bank-specific determinants that will affect a bank's profitability such as bank size, capital and cost to income ratio. On the other hand, the external factor can be considered as macroeconomic factor, which is the factor that related to a broad economy that affects whole market rather than small population. The external factors that widely used to investigate the bank profitability performance include gross domestic product, interest rate, inflation, and financial crisis.

The purpose of this research is to investigate the economic factors that will affect the performance of foreign banks in Malaysia. In this study, eight foreign banks in Malaysia have been selected based on their average total assets among year 2005 to 2010 which are HSBC Bank, OCBC Bank, Standard Chartered Bank, Citibank, UOB Bank, Deutsche Bank, Bank of Tokyo Mitsubishi-UFJ, and Royal Bank of Scotland.

## **1.2 Problem Statement**

Bank is an important player in financial system and it plays an important role in economic growth. After the reformation of banking system, foreign banks are allowed to participate in domestic banking market. The entry of foreign banks has increased the competition in the banking system and this leaves a huge impact on the domestic banking market. Therefore, banks have to improve their products and services in order to achieve better performances which help them to survive in the banking market. In some cases, the participation of foreign bank in domestic market is believed that it will bring benefit instead of harm to the domestic banks. However, the banking management between domestic bank and foreign bank may be different and thus cause the difference of their profitability.

Banks receive their profits from the differences between interest earned and paid. Most of the banks will pass the costs such as transaction cost and taxes to the customers in order to reduce their costs. The banks' efficiency is shown from the way they increase their profit and reduce their costs. Bank that performs well has the ability to receive negative economic shock and contribute financial market stability. Normally, bank with large amount of capital tends to be more profitable and better in performance than those banks with smaller capital. It is undeniable that bank with larger capital would gain more benefit. However, Pallage (1991) suggests that the bank will earn less profit when the bank size is getting larger due to diseconomy of scale. Financial crisis is the effect of economic downturn, which could have huge impact on the whole economy and affect the performance of banks, especially the large bank. Therefore, it will be a necessary to determine banks performance before and after global financial crisis.

Furthermore, the restriction on monetary policy may also affect the profits earn by bank. In general, the profits of bank are calculated in the way of interest received minus out the interest paid. The changes of interest rate will greatly affect the changes of interest received and paid out. Therefore, whenever there is change in monetary policy that lead to change in interest rate, it will affect the profitability of bank. A research that investigates the key factors that may affect the profitability will be helpful in formulating strategies or ways to improve profitability and efficiency of bank. Many people may believe that bank is deemed as "too big to fail", however, if there is failure in banks, it will give a huge impact to the whole financial markets as well as customer's confidence towards the banks

In general, same economic condition will be applied to both local and foreign bank since they are operating in one country. However, there is evidence show that it is not necessary that all economic condition can be used in determine foreign bank's performance. According to Cleassens, Dermirguc-Kunt, and Huizinga (2000) and Sturm and Williams (2004), foreign bank's performance has been found to have a better performance in a developing country but the opposite in developed country. With same economic condition but result in different performance, it has led to a question on what are the key factors that affect the foreign bank's profitability. The key factors that affect the performance of local bank may be different from foreign bank. Therefore it will be interesting to determine the main key factors that affect the performance of foreign bank Previously, there are many research paper have done on the profitability of domestic and foreign banks. Hereby, this research paper aims to fill in the gap by investigating the factors that affect the profitability performance of foreign banks in Malaysia. This study includes the microeconomic and macroeconomic variables to determine the profitability of eight foreign banks in Malaysia from years 2005 to 2010.

# **1.3 Research Objectives**

The main objective of this study is to examine the economic factors influencing the performance of foreign banks in Malaysia for the period of 2005 to 2010. The performance of foreign banks is measured by ROA while the explanatory variables are the microeconomic and macroeconomic determinants.

## 1.3.1 General Objectives

To investigate the economic factors that affecting the performance of foreign banks in Malaysia for the period of year 2005 to 2010.

## **1.3.2 Specific Objectives**

To identify whether the economic factors which are microeconomic and macroeconomic factors have impact on the performance (ROA) of foreign banks in Malaysia.

- To identify whether the bank size which measured by total assets will affect the performance of foreign banks in Malaysia.
- To identify whether the capital ratio which measured by risk-weighted capital ratio will affect the performance of foreign banks in Malaysia.

- To identify whether the cost to income ratio will affect the performance of foreign banks in Malaysia.
- To identify whether the real gross domestic product (GDP) will affect the performance of foreign banks in Malaysia.
- To identify whether the real interest rate will affect the performance of foreign banks in Malaysia.
- To identify whether the inflation will affect the performance of foreign banks in Malaysia.
- To identify whether the global financial crisis will affect the performance of foreign banks in Malaysia.

# 1.4 Research Questions

- Will the bank size which measured by total assets affect the performance of foreign banks in Malaysia?
- Will the capital ratio which measured by risk-weighted capital ratio affect the performance of foreign banks in Malaysia?
- Will the cost to income ratio affect the performance of foreign banks in Malaysia?
- Will the real GDP affect the performance of foreign banks in Malaysia?
- Will the real interest rate affect the performance of foreign banks in Malaysia?
- Will the inflation affect the performance of foreign banks in Malaysia?
- Will the global financial crisis affect the performance of foreign banks in Malaysia?

# **1.5** Hypotheses of the Study

This study included seven independent variables to investigate the impact of microeconomic and macroeconomic factors on the foreign banks' performance in Malaysia. The definition of the variables and the hypotheses are stated as:

#### 1.5.1 Bank Size

Bank size is one of the important factors in explaining a bank's performance (Pasiouras & Kosmidou, 2007). It is used to account for size related economies and diseconomies of scale. Most of the previous researches have used the total assets as a proxy variable for bank size. Gul, Irshad, and Zaman (2011) suggests that a bank with higher total assets indicates a larger bank can achieve a higher ROA.

H<sub>0</sub>: Bank size does not have significant effect on the performance of foreign banks in Malaysia.

H<sub>1</sub>: Bank size has significant effect on the performance of foreign banks in Malaysia.

## 1.5.2 Capital Ratio

Risk-weighted capital ratio is the proxy for bank capital which is used to measure the capital strength of a bank. This ratio can be obtained from the annual report of each foreign bank which incorporated in Malaysia. It is used to identify how much shareholders would receive in the event of a firm liquidation. Capital ratio indicates the level of risk of a bank which in turn will affect the profitability of the bank. H<sub>0</sub>: Capital adequacy does not have significant effect on the performance of foreign banks in Malaysia.

H<sub>1</sub>: Capital adequacy has significant effect on the performance of foreign banks in Malaysia.

## 1.5.3 Cost to Income Ratio

Cost to income ratio also known as efficiency ratio which is used to measure the impact of operating efficiency on the performance of foreign banks. This ratio is calculated by dividing the operating expenses by the total of net interest income and non-interest income. A bank with higher cost to income ratio indicates that the operating efficiency is lower and thus generates lower profitability (Dietrich & Wanzenried, 2011).

H<sub>0</sub>: Cost to income ratio does not have significant effect on the performance of foreign banks in Malaysia.

H<sub>1</sub>: Cost to income ratio has significant effect on the performance of foreign banks in Malaysia.

## 1.5.4 Real Gross Domestic Product (RGDP)

Real GDP is the most frequently used macroeconomic variable to measure the total economic conditions in a country. According to Dietrich and Wanzenried (2011), economic growth will increase the demand for lending and thus influence the bank's profitability. Pasiouras and Kosmidou (2007) also stated that economic condition will influence the performance of financial sectors.

H<sub>0</sub>: Real GDP does not have significant effect on the performance of foreign banks in Malaysia.

H<sub>1</sub>: Real Gross Domestic Product (GDP) has significant effect on the performance of foreign banks in Malaysia.

#### 1.5.5 Real Interest Rate

Samuelson (1945) and Alper and Anbar (2011) found that interest rate will affect the bank's performance and it is one of the main factors that will affect the profit earn from loans. Changes in interest rate will affect the amount of interest receive which in turn affect the performance of banks.

H<sub>0</sub>: Real interest rate does not have significant effect on the performance of foreign bank in Malaysia.

H<sub>1</sub>: Real interest rate has significant effect on the performance of foreign bank in Malaysia.

## 1.5.6 Inflation

Inflation reflects the economy was in a high price condition. High inflation in the market will usually cause the banks to adjust their lending and saving policies according to economic environment in order to generate substantial profit (Rasiah, 2010; Bashir, 2003; Sufian and Habibullah, 2010). The occurrence of inflation will increase the cost and revenue of a bank and thus cause variability in profit generated. H<sub>0</sub>: Inflation rate does not have significant effect on the performance of foreign banks in Malaysia.

H<sub>1</sub>: Inflation rate has significant effect on the performance of foreign banks in Malaysia.

## 1.5.7 Global Financial Crisis

Global financial crisis is one of the important variables in affecting the performance of banks. Financial crisis will slowdown the economic activities and thus will influence the capital strength of banks (Sufian & Habibullah, 2010). This will directly affect the profitability of banks.

H<sub>0</sub>: Global financial crisis does not have significant effect on the performance of foreign bank in Malaysia.

H<sub>1</sub>: Global financial crisis has significant effect on the performance of foreign bank in Malaysia.

# **1.6** Significance of the Study

The significance of this study is to provide the empirical evidence on which economic factors can affect the performance in term of ROA of foreign banks in Malaysia. This research give other researchers a better understanding on what are the factors that will affect the foreign banks' performance, whether is the microeconomic factors (internal) or macroeconomic factors (external). Therefore, the result of this study can be used as a reference or foundation to other researchers for further research.

Other than that, this study can also provide an idea for the bank manager on decision making such as efficiency management in order to achieve higher profits. Bank manager can be guided on strategic planning for the company and can make more precise decision. This can help the banks to perform well and to get a better financial position.

Moreover, this study can act as a guideline for the investors. They can get some information about which factor may affect the profitability of the banks. This can be the extra information or reference for them to consider their own investment decision.

# 1.7 Chapter Layout

This research paper has been organized into 5 chapters. The layout of this study is as follows:

#### 1.7.1 Chapter 1

An introductory chapter that give overview of this study with research background, description of problem statement, research objectives, the hypothesis to be tested and significance of this study.

## 1.7.2 Chapter 2

Review the literatures that have been done by previous researchers which related to the factors that affecting the performance of banks. This chapter provides the foundation of theoretical framework to identify the relationships among the variables.

#### 1.7.3 Chapter 3

This chapter describes the methodology used to execute this research in terms of the research design, data collection method, sampling design, research instruments, constructs measurements, data processing and data analysis.

## 1.7.4 Chapter 4

This chapter presents the results and findings of the research. It includes the analysis and discussions of the major findings that determine the performance of foreign banks in Malaysia.

## 1.7.5 Chapter 5

The last chapter will include the summary of the analysis and discussions of major findings. In addition, this chapter also discusses the limitations of this study and provides some recommendations for future research.

# 1.8 Conclusion

In this chapter, the purpose of this research was clearly defined, which is to investigate the economic factors that affect the performance of foreign banks in Malaysia for the period of 2005 to 2010. The research background, problem statement, research objective, research question, hypothesis of the study, significant of the study and chapter layout has been introduced. The literature review for this research will be presented in the next chapter and the results for the entire research question will also be concluded in the following chapters.

## **CHAPTER 2: LITERATURE REVIEW**

## 2.0 Introduction

This chapter reviews the previous studies as well as the theoretical models related to this research topic. A number of studies have been done on the determinants of bank profitability, both at the multinational and specific country. This study aims to investigate the microeconomic factors or bank-specific determinants and the macroeconomic factors that influencing the foreign banks' profitability performance. In addition, this chapter presents the conceptual framework by using the diagram and label to show the network of relationships among the important variables in the research. Next, this chapter proceeds to the hypothesis development which formulates the hypothesis for the relationship between the variables. These hypotheses will be tested with empirical model in the following chapter. Lastly, a summary of the whole chapter will be presented in the conclusion.

## 2.1 Review of the Literature

This section reviews the relevant literature on both the dependent variable and independent variables that related to the research topic. The sub-session describes the dependent variable followed by seven independent variables which consists of micro bank-specific drivers and macroeconomic factors.

#### 2.1.1 Return on Assets Ratio

The traditional ratios that used to measure the profitability of any business are return on assets (ROA) and return on equity (ROE). In this study, the ROA

ratio will be used as the measurement of bank profitability. ROA is calculated by dividing the net income by total assets to measure the profit earned per dollar of assets. This ratio is widely used to represent the bank profitability in previous study such as the research of Gul, Irshad, and Zaman (2011), Oladele, Sulaimon, and Akeke (2012), Said and Tumin (2011), and Alper and Anbar (2011). ROA indicates how efficient bank management is at using the bank's assets to generate profits, although it may be biased as a result of off balance sheet activities (Athanasoglou, Brissimis, & Delis, 2008). Assets are owned by an individual or business to generate inflow of money. For banks, loan and securities are considered as assets which are used to generate most of a bank's income.

#### 2.1.2 Bank Size

Bank size is one of the important bank-specific determinants of performance. In this study, total assets of the banks will be used as a proxy variable to measure the bank size. Gul, Irshad, and Zaman (2011) used bank size as one of the internal factors and found that larger banks can achieve higher ROA. It indicates size is positively related to the bank profitability. This result is consistent with Smirlock (1985), suggests that larger banks are likely to have greater product and loan diversification as compared with smaller banks because larger banks may result in economies of scale and thus enjoy higher level of profits. The loan diversification indicates banks have lower risk exposure and hence lower required rate of return. In addition, the positive impact on bank profitability may be up to certain point and it could be negative effect when a bank becomes extremely large due to agency costs, bureaucratic and other cost of management (Stiroh & Rumble, 2006; Athanasoglou, Brissimis, & Delis, 2008).

Pallage (1991) studied the scale and scope economies for the Belgian Banking Sector, found that strong economies of scale only for small institutions and diseconomies of scale for the banks with larger size which is over BEF 100 billion of asset. Moreover, this negative relationship between bank size and profitability also proved by Pasiouras and Kosmidou (2007) and Javaid, Anwar, Zaman, and Gafoor (2011) in investigate the factors that influencing the bank profitability in European Union and Pakistan respectively. On the other hand, Athanasoglou et al. (2008) suggest there is non-linear relationship between bank size and profitability. Therefore, bank size is measured by natural logarithm of total assets to account for the non-linear relationship.

#### 2.1.3 Capital Ratio

This study uses the risk-weighted capital ratio as a proxy for bank's capital, to measure the capital strength of foreign banks. The risk-weighted capital ratio can be obtained from the annual reports of eight foreign banks which incorporated in Malaysia. Berger (1995) suggests capital is positively related to bank's performance that well-capitalized banks face lower expected bankruptcy cost and thus lower cost of capital. In addition, banks with higher capital ratio are considered as relatively safer and lower risks that increase banks creditworthiness and hence resulting in lower cost of funding (Pasiouras & Kosmidou, 2007). The positive relationship between capital and bank's profitability are also supported by Bennaceur and Goaied (2008), Athanasoglou, Brissimis, and Delis (2008), Oladele, Sulaimon, and Akeke (2012), Javaid, Anwar, Zaman, and Gafoor (2011), and Bourke (1989). Ramlall (2009) investigate the determinants of profitability in Taiwanese Banking System, found that capital level have significant positive relation with bank profitability. A bank with higher capital level can easily extend more loans and thus earn more profit. This is because by having more capital, a bank can easily adhere to regulatory capital standards.

In contrast, the conventional risk-return hypothesis would indicate capital ratio is negatively related to the bank performance. A bank with lower capital ratio implies that the banks have higher risk exposure may have higher return as compared to well-capitalized bank. The negative relationship between capital ratio and bank profitability is proven by the study of Pasiouras and Kosmidou (2007) on the determinants of domestic and foreign commercial banks in European Union.

#### 2.1.4 Cost to Income Ratio

Cost to income ratio, also known as efficiency ratio, is used to measure the impact of operating efficiency on bank performance. This ratio can be used as a benchmark of bank's efficiency, to measure a bank's operating costs as proportion of its total income. The cost to income ratio is defined as the operating costs divided by the sum of net interest income and non-interest income. The operating costs or non-interest expenses includes the administrative costs, salaries of staff, property costs but usually excludes tax expense, bad and doubtful debts expense. This is because such expenses are related to the quality of credit decision made in earlier periods but not the current performance of bank. In addition, if the costs to income ratio include doubtful debt expense, the result will be misleading when the major write-offs were undertaken.

A higher ratio indicates less efficient in management and could have negative effect on bank profitability. Dietrich and Wanzenried (2011) used the GMM model to analyze the determinants of 372 commercial banks' profitability in Switzerland during the pre-crisis and post-crisis period. Result shows that the cost to income ratio has significant negative effect on the ROA and ROE over the period. An increase (decrease) in the expenses may result in lower (higher) profitability. Pasiouras and Kosmidou (2007) argue the cost to income ratio is the most important determinants of profitability for foreign banks and it has negative impact on bank's profit. This result is consistent with Oladele, Sulaimon, and Akeke (2012), and Mathuva (2009).

#### 2.1.5 Real Gross Domestic Product (GDP)

Gross Domestic Product (GDP) indicates the economic activities and output generated in particular country. These activities may have directly impact on every sector including the banking sector in terms of profits. Therefore, bank profitability is highly correlated with economic environment as well as upswing and downswing of business cycle. Athanasoglou, Brissimis, and Delis (2008) explained several reasons that bank profitability may be procyclical. Firstly, risk increased during cyclical downswings in the business cycle could cause the lending activity to decrease. In similar circumstances, the deterioration of loans quality lead to higher provisions that held by bank. Secondly, economic booms would stimulate higher demand for credit and stock market transactions and the interest margin may widen. Hence, increased in revenue could more than the cost incurred and thus lead to higher profits. In contrast, profits would decrease during economic slowdowns.

According to Demirguc-Kunt and Huizinga (1998), business cycle is highly correlated with bank profitability, and this business cycle plays a vital role in promoting economic growth of a country. Gul, Irshad, and Zaman (2011) investigate the factors that affecting the bank profitability in Pakistan, found that GDP have positive effect on the bank profitability and the relationship of GDP trends are associated with business cycle movement. This result is consistent with the study of Heffernan and Fu (2010), Sufian and Habibullah (2010), and Dietrich and Wanzenried (2011).

#### 2.1.6 Real Interest Rate

In general, bank profits are composed of interest income and non-interest income. Therefore, variation in interest rate tends to change the balance sheet components and earning profit of banks. However, banks are composed of highly leverage operation institution which financing short term liabilities to earn long term assets in terms of interest earning. Moreover, prudence concept should carry on by banks to avoid the fluctuation of interest rate which could cause decrease in value of banks' interest earning assets. Dietrich and Wanzenried (2011) found that the term structure of interest rate is positively affects the profitability performance of Swiss banks during the financial crisis period. In Switzerland, commercial banks use short term deposits to finance long term loans. It suggests there is a steeper yield curve during the financial crisis period, and thus positively affects the profitability. Interest income is an important source of income for banks and it will be affected by the changes of interest rate.

According to Ramlall (2009), bank's profits could be affected by interest rate through two main channels of the revenue side. First, increase in interest rate strengthens the income that earns by bank on new assets it acquires. However, the speed of revenue adjustment will be affected by the speed of interest rate adjustment. Second, the amount of loans and securities held is the crucial factor. An increase in interest rate is a strong incentive for banks to have more loans rather than buying securities, as the rates on loans are higher than the marketable securities. Samuelson (1945) provides evidence that increased in interest rate result in higher banks profits. Moreover, previous research of Rasiah (2010) also supports the positive relationship between commercial bank profitability and real interest rate.

#### 2.1.7 Inflation Rate

Inflation commonly defined as a continued increase in the price level in a particular economy. High inflation in the economy tends to diminish the real purchasing power of consumers, while in banking sectors, inflation will diminish the real rate of return of bank assets compared to liabilities.

Most of the researchers suggest there is a significant and positive relationship between inflation and bank profitability. This result indicates bank management predicted there is anticipated inflation and their operating activities are based on anticipated inflation rate. Hence, profits could be generated when bank revenue adjusted according to market inflation rate and operating cost. High inflation leads to high interest rate and high profits in an anticipated inflation condition (Rasiah, 2010; Bashir, 2003; Sufian and Habibullah, 2010)

However, there is possible to discover negative relationship between inflation and bank profitability performance when there is an unanticipated inflation in the economy. Unanticipated inflation could result in bank management sluggish to adjust their interest rate. This may lead to losses when bank unable to adjust their interest income compared to inflation cost incurred in operating activities. Therefore, inflation may increase the operating costs which in turn reduce the bank profit. This is supported by Khrawish (2011) and Boyd, Levine, and Smith (2000). In contrast, the study of Naceur (2003) found no relationship between bank profitability and inflation in Tunisian banking industry, indicates bank unable to earn profit in inflationary environment. This result is consistent with Derbali (2011).

#### 2.1.8 Global Financial Crisis

Global financial crisis raise an important issue since the impact on particular industry and country is large. Research paper of Sufian and Habibullah (2010) examined the effect of crisis on bank performance for 3 difference period including pre-crisis, during crisis and post-crisis period. The authors mainly examine on bank capital function in assisting the bank to against the crisis. The result shows that well-capitalized banks less exposed to credit risk and losses during pre-crisis and post-crisis period. During the crisis and pre-crisis period, bank tends to operate based on skimping resources and focus on monitoring loan to avoid loan default and losses. In conclusion, the results are mix whereby bank profitability response positively to the effect of crisis during pre-crisis and post-crisis while response negatively during the crisis period.

In addition, the significant and positive relationship between crisis and bank profitability is supported by the research of Dietrich and Wanzenried (2011) on Switzerland commercial and saving bank during crisis as well as the research of Lindblom and Willesson (2011) which express concern on European Bank with different region and strength during crisis period. Furthermore, the study of Derbali (2011) on Tunisian bank shows a positive result and hence the author strongly believe that the supporting of local Central Bank on prudent supervision and restriction on policies implement are successfully overcome Tunisian banks during the crisis. In contrast, Aebi, Sabato, and Schmid (2012) mainly focus on examine the bank profitability performance and risk management apply before and during crisis. The authors further discovered banks that apply risk governance and operate Chief Risk Officer (CRO) and Chief Executive Officer (CEO) separately tends to outperform than those combine CRO's and CEO's in their operations management before and during the crisis. On the other hand, Berger and Bouwman (2012) also found positive relationship between crisis and bank

profitability by further examine to different bank size and bank capital perspective.

## 2.2 Review of Relevant Theoretical Models

This section reviews the theoretical models that used by previous researchers to investigate the relationship between bank performance and relevant independent variables. There are four methods are widely used to study the determinants of bank performance including panel regression model, GMM (General Method of Moments) model, and financial ration analysis.

#### 2.2.1 Panel Data Regression Model

Panel data regression model is commonly used to investigate the determinants of bank performance. A data set that consists of both cross-sectional and time series data is known as panel data. Investigation on the profitability determinants of foreign banks require data set of different observations across different time period and thus panel data estimation was used. There are three types of panel data regression models, which are fixed effects model (FEM), random effects model (REM), and pooled OLS (Ordinary Least Squares) model.

The objective of FEM is to examine the individuals' characteristics for each observation in the sample based on intercept term regardless of time effect. Kosmidou, Pasiouras, and Tsaklanganos (2007) employed the panel data regression model which integrated a set of domestic and multinational determinants to examine the profitability of Greek bank operating in 11 nations. Under panel data estimation, Ramlall (2009) used FEM to investigate the bank-specific, industry-specific and macroeconomic determinants of

profitability of banking system in Taiwan. A Hausman test is used to test whether the fixed effects model is appropriate than random effect model to be used in the empirical analysis. Similar method was employed by Pasiouras and Kosmidou (2007), Oladele, Sulaimon, and Akeke (2012), and Alper and Anbar (2011) since Hausman test suggests that FEM is the most appropriate empirical model.

The second type of panel data regression model is random effect model. REM is used to examine the individual's characteristics for each observation in the sample based on random error terms. Williams (2003) employed REM to investigate the domestic and international determinants of foreign banks' profits in Australia. The FEM is not suitable in this case as the model proposed comprises time-invariant dependent variables such as bank license and nationality of origin. Moreover, Bennaceur and Goaied (2008) and Derbali (2011) employed REM which estimated using the Generalized Least Squares (GLS) procedure in the study since the Hausman test concludes that REM is more appropriate than the FEM.

Pooled OLS model also known as time-invariant model, is the third type of panel data regression model which states that the characteristics for given observation are constant over time. Javaid, Anwar, Zaman, and Gafoor (2011) used pooled OLS model to analyze the internal factor influencing the bank profitability in Pakistan. They believed that the relationship between variables is constant across banks because the data set provides evidence that Pakistani banks respond similarly to cyclical movements. This methodological framework is similar to the study of Gul, Irshad, and Zaman (2011).

#### 2.2.2 GMM (General Method of Moments) Model

The panel data regression model is inappropriate if a lagged dependent variable or other regressors is important, especially in the context of many
observation and few time periods. Berger, Bonime, Covitz, and Hancock (2000) suggests that bank profits show a tendency to persist over time, reflecting impediments to market competition, informational opacity and/or sensitivity to regional/macroeconomic shocks to the extent that these are serially correlated. As a consequence, estimation with least squares methods produce biased and inconsistent result (Baltagi, 2001). Apart from that, other challenges exist in the estimation of bank profitability is the endogeneity problem and unobservable heterogeneity across banks. The GMM, also known as system GMM estimator was developed by Arellano and Bond (1991) to account for profit persistence and potential endogeneity problems. This model includes one-period lagged dependent variable and an estimator, representing the speed of adjustment to equilibrium, as well as lagged values of other regressors. Due to the dynamic nature of the data, Athanasoglou, Brissimis, and Delis (2008) estimate the model with GMM technique to investigate bank-specific, industry-specific, and the macroeconomic determinants of Greek's bank profitability. Similar technique was used by Dietrich and Wanzenried (2011), Heffernan and Fu (2010) in the study to empirically investigate the determinants of bank profitability. The system GMM estimator deals with the problem of unobserved heterogeneity and profitability persistence. Therefore, this estimator provides consistent estimations of the parameters.

#### 2.2.3 Financial Ratio Analysis

Apart from the empirical analysis of bank performance, financial ratio analysis is another way to measure the performance of bank or to conduct comparative analysis on performance with benchmark. This can be done by collecting the financial data from the balance sheet of banks and compute the financial ratios over the years. Alam, Raza, and Akram (2011) used financial ratio to compare the performance of public and private banks in Pakistan. Financial ratios such as efficiency/profitability ratios, liquidity ratios, capital/leverage ratios and asset quality ratios were calculated by using the data collected from four public banks and twenty five private banks. The comparison between banks' performance based on financial ratio provides an opportunity to evaluate whether the banks have improve their performance over the years. Pak and Huh (1995) selected several performance ratios such as core capital to total assets, interest spread, and return on assets to conduct the comparative analysis of Korean banks' performance for five years. Furthermore, Kumbirai and Webb (2010) employed financial ratio to investigate the performance of five large commercial banks in South Africa and compare the bank performance during the pre-crisis period with postcrisis period.

#### 2.3 Proposed Theoretical/ Conceptual Framework

This section illustrates the network of relationships among the important variables as shown in figure 2.1. This framework developed based on the research objective of this study which is to investigate whether the economic factors (bank size, capital ratio, cost to income ratio, real GDP, real interest rate, inflation and crisis) will affect the profitability performance (ROA) of foreign banks in Malaysia.



Figure 2.1: Proposed Theoretical / Conceptual Framework

# 2.4 Hypothesis Development

This study included seven independent variables to investigate the impact of microeconomic and macroeconomic factors on the foreign banks' performance in Malaysia. The definition of the variables and the hypotheses are stated as below:

## 2.4.1 Bank Size

Bank size is one of the important factors in explaining a bank's performance (Pasiouras & Kosmidou, 2007). It is used to account for size related economies and diseconomies of scale. Most of the previous researches have used the total assets as a proxy variable for bank size. Gul, Irshad, and Zaman (2011) suggests that a bank with higher total assets indicates a larger bank can achieve a higher ROA.

H<sub>0</sub>: Bank size does not have significant effect on the performance of foreign banks in Malaysia.

H<sub>1</sub>: Bank size has significant effect on the performance of foreign banks in Malaysia

# 2.4.2 Capital Ratio

Risk-weighted capital ratio is the proxy for bank capital which is used to measure the capital strength of a bank. This ratio can be obtained from the annual report of each foreign bank which incorporated in Malaysia. It is used to identify how much shareholders would receive in the event of a firm liquidation. Capital ratio indicates the level of risk of a bank which in turn will affect the profitability of the bank.

H<sub>0</sub>: Capital adequacy does not have significant effect on the performance of foreign banks in Malaysia.

H<sub>1</sub>: Capital adequacy has significant effect on the performance of foreign banks in Malaysia.

## 2.4.3 Cost to Income Ratio

Cost to income ratio also known as efficiency ratio which is used to measure the impact of operating efficiency on the performance of foreign banks. This ratio is calculated by dividing the operating expenses by the total of net interest income and non-interest income. A bank with higher cost to income ratio indicates that the operating efficiency is lower and thus generates lower profitability (Dietrich & Wanzenried, 2011).

H<sub>0</sub>: Cost to income ratio does not have significant effect on the performance of foreign banks in Malaysia.

H<sub>1</sub>: Cost to income ratio has significant effect on the performance of foreign banks in Malaysia.

## 2.4.4 Real Gross Domestic Product (RGDP)

Real GDP is the most frequently used macroeconomic variable to measure the total economic conditions in a country. According to Dietrich and Wanzenried (2011), economic growth will increase the demand for lending and thus influence the bank's profitability. Pasiouras and Kosmidou (2007) also stated that economic condition will influence the performance of financial sectors.

H<sub>0</sub>: Real GDP does not have significant effect on the performance of foreign banks in Malaysia.

H<sub>1</sub>: Real Gross Domestic Product (GDP) has significant effect on the performance of foreign banks in Malaysia

## 2.4.5 Real Interest Rate

Samuelson (1945) and Alper and Anbar (2011) found that interest rate will affect the bank's performance and it is one of the main factors that will affect the profit earn from loans. Changes in interest rate will affect the amount of interest receive which in turn affect the performance of banks.

H<sub>0</sub>: Real interest rate does not have significant effect on the performance of foreign bank in Malaysia.

H<sub>1</sub>: Real interest rate has significant effect on the performance of foreign bank in Malaysia.

## 2.4.6 Inflation

Inflation reflects the economy was in a high price condition. High inflation in the market will usually cause the banks to adjust their lending and saving policies according to economic environment in order to generate substantial profit (Rasiah, 2010; Bashir, 2003; Sufian & Habibullah, 2010). The occurrence of inflation will increase the cost and revenue of a bank and thus cause variability in profit generated.

H<sub>0</sub>: Inflation rate does not have significant effect on the performance of foreign banks in Malaysia.

H<sub>1</sub>: Inflation rate has significant effect on the performance of foreign banks in Malaysia.

## 2.4.7 Global Financial Crisis

Global financial crisis is one of the important variables in affecting the performance of banks. Financial crisis will slowdown the economic activities and thus will influence the capital strength of banks (Sufian & Habibullah, 2010). This will directly affect the profitability of banks.

H<sub>0</sub>: Global financial crisis does not have significant effect on the performance of foreign bank in Malaysia.

H<sub>1</sub>: Global financial crisis has significant effect on the performance of foreign bank in Malaysia.

# 2.5 Conclusion

In conclusion, chapter 2 reviews the literature from previous study and the theoretical models which have been employed by previous researchers to investigate the determinants of bank performance. The dependent variable and seven economic factors are discussed respectively in this chapter. Next, the proposed conceptual framework illustrates the network of relationship between the variables and then followed by the hypothesis development. The empirical model that use in this research will be introduced in next chapter to test whether the hypothesis is correctly stated.

# **CHAPTER 3: METHODOLOGY**

# 3.0 Introduction

This chapter describes the different approaches that will be applied to gather necessary information in order to perform a successful research study, contributing to the development of a valid and critical thesis. All elements of the research paper, theory, empirical findings and analysis were structured in order to address and evaluate the research questions and objective. The following sections describe how the research is carried out in terms of research design, data collection methods, and methods of data analysis.

# 3.1 Research Design

This thesis rounds up quantitative data in form of secondary. Secondary data has been collected through numerous types of documents providing the theoretical background.

The regression model that use to study the economic factors that will affect the performance of foreign banks in Malaysia is estimated in the following form:

$$\begin{split} ROA &= \beta_0 + \beta_1 LTA + \beta_2 CR + \beta_3 CIR + \beta_4 LRGDP + \beta_5 INT + \beta_6 INF \\ &+ \beta_7 CRISIS + \varepsilon \end{split}$$

The independent variable, total assets and real GDP is log-transformed due to the original value is too large compared to other variables. When the value of variable is large, the absolute error is also large, and this will lead to a large residual error. (Manning & Mullahy, 2001) Furthermore, the coefficient value become very small when conducting the data analysis via Eview and this result is very difficult to interpret. Therefore, it is needed to transform these two variables into natural

logarithm form to standardize the scale of measurement and reduce the residual errors and also avoid outlier problem in the model.

Varia	ables		Description				
Dependant variable							
Y	Y ROA Return on Asset		Bank profitability				
Indep	Independent variable						
Y	ITA	Log Total Assets	Bank size which is measured by total				
л1		Log Total Assets	assets of bank				
<i>X</i> <sub>2</sub>	CR	Capital Ratio	Risk-weighted capital ratio				
			Operating costs divided by the sum of				
<i>X</i> <sub>3</sub>	CIR	Cost to Income Ratio	net interest income and non-interest				
			income.				
<i>X</i> <sub>4</sub>	LRGDP	Log Real GDP	Economic activities and outputs				
<i>X</i> <sub>5</sub>	INT	Interest Rates	Real interest rate				
<i>X</i> <sub>6</sub>	INF	Inflation	Annual inflation rate				
Y	CRISIS	CRISIS Global Financial Crisis	Dummy variable, where				
Λ7	CRISIS		07-08 financial crisis = 1, otherwise = $0$				

Table	3.1:	Definition	of the	variables

# **3.2 Data Collection Methods**

The empirical analysis is carried out by using yearly data. This study employ the short balanced panel data which means the number of observations is more than the number of time periods. The panel dataset covers a 6-years period from 2005 to 2010, with a sample of eight foreign banks incorporated in Malaysia. The data were collected from Datastream which provides wide range of information around the world and the data is collected from reliable sources such as International Monetary Fund (IMF) and World Bank.

#### 3.2.1 Secondary Data

This study is to investigate the microeconomic factors or internal factors as well as the macroeconomic factors that influencing the foreign banks' profitability performance. This research investigate bank profitability with economic variables like bank size, capital ratio, cost to income ratio, real GDP, real interest rate, inflation, and global financial crisis. Bank size is measured by total assets of the banks; capital ratio is the measurement of capital strength of foreign banks; cost to income ratio is used to measure the impact of operating efficiency on bank performance; real GDP is used to measure the impact of business cycle on profits in banking sector; real interest rate tends to affect the earning profit of banks; inflation is a vital factor to determine bank performance; and global financial crisis would affect the bank profitability. The data collection of the study is based on the secondary data. The data for the macroeconomic variables such as inflation, real interest rate, and real GDP were obtained from Datastream. While the micro-variables such as bank size (total assets), capital ratio, and cost to income ratio, were calculated by obtain the figures from annual reports of the foreign banks respectively. The sample period in this study is from 2005 to 2010, which are the most recent 6 years data from 1st January 2005 to 31st December 2010 because the recent data is more accurate to test the recent banks' profitability performance.

Moreover, the choice of yearly data was constrained by the reason of calculating the ratios. The financial reports of the foreign banks were published annually. Besides, the purpose of getting 6 years of data is to increase the sample size since larger sample size could provide more accurate results.

# 3.3 Data Analysis

This study employ the short balanced panel data to conduct the empirical analysis, thus panel data regression model is use to investigate the economic factors that affecting the performance of foreign banks based on ROA of the banks. There are three types of panel data regression models, includes Pooled OLS Model, Fixed Effect Model (FEM) and Random Effect Model (REM). Pooled OLS Model assumes that the intercept and coefficient values for each observation that across time are same. It is the simplest model and easy to interpret. On the other hand, FEM is a panel regression model that able to examine different characteristics from different observations with dummy variables. Moreover, REM is to estimate the characteristics for each observation based on error terms without including dummy variables. Other than that, Poolibility hypothesis testing and Hausman test will be carried out to test whether which panel data regression model is appropriate.

## 3.3.1 Poolibility Hypothesis Testing

Poolibility hypothesis testing is use to test whether the Pooled OLS model or the Fixed Effect Model (FEM) is more appropriate to be used in the empirical analysis. The hypothesis for Poolibility hypothesis testing is stated as below:

H<sub>o</sub>: There is a common intercept on all the foreign banks.

H<sub>1</sub>: There is no common intercept on all the foreign banks.

The test statistic for the Poolibility hypothesis testing is the restricted F test. The formula for the F test is shown as below:

$$F = \frac{(R^{2}_{FEM} - R^{2}_{pooled})/(k_{FEM} - k_{pooled})}{(1 - R^{2}_{FEM})/(n - (k_{FEM} + 1))}$$

The null hypothesis,  $H_0$  will be rejected if the test statistic (F) is greater than the critical value or the P-value is less than significance level. Otherwise, do not reject the  $H_0$ . In addition, the null hypothesis means that the Pooled OLS is the best model while the alternative hypothesis support the FEM is the best model. In conclusion, if the null hypothesis is rejected, FEM is more suitable to be used in this empirical analysis.

#### 3.3.2 Hausman Test

Hausman test is use to test whether the Fixed Effect Model (FEM) or the Random Effect Model (REM) is more appropriate to be used in the empirical analysis. Similar method was employed by Pasiouras and Kosmidou (2007), Oladele, Sulaimon, and Akeke (2012), and Alper and Anbar (2011) since Hausman test suggests that FEM is the most appropriate empirical model in the study. The hypothesis testing for Hausman test is stated as below:

H<sub>0</sub>: REM is consistent and efficient.

H<sub>1</sub>: REM is inconsistent and inefficient. (FEM will be always consistent)

The decision rule stated the null hypothesis  $(H_0)$  can be rejected if the test statistic (H) is greater than the critical value or the P-value is less than significance level. Otherwise, do not reject  $H_0$ . Next, the test statistic uses for the Huasman test is the H test and the formula is shown in below:

$$\mathbf{H} = (\hat{\boldsymbol{\beta}}^{\text{FE}} - \hat{\boldsymbol{\beta}}^{\text{RE}}) \left[ \text{Var}(\hat{\boldsymbol{\beta}}^{\text{FE}}) - \text{Var}(\hat{\boldsymbol{\beta}}^{\text{RE}}) \right]^{-1} (\hat{\boldsymbol{\beta}}^{\text{FE}} - \hat{\boldsymbol{\beta}}^{\text{RE}})$$

When  $H_0$  is rejected, it implies that the FEM is more appropriate than REM. Therefore, the study should employ the FEM to conduct the empirical analysis.

#### 3.3.3 Diagnostic Test

Diagnostic checking could not be done in this study due to the failure process in E-View. Hence, the normality test and sensitivity analysis are used for checking and make sure that the estimated result is reliable.

Normality test is to test whether the data collected is normally distributed. It is a function that plots a score of probability value which concentrated at the mean and it is usually represent in the shape of bell-shaped curve. A skewness and kurtosis of zero form a normal distribution. Skewness is a measurement of symmetry of data with the mean while kurtosis is the volatility of distribution which describes the symmetry data around the mean. When the model is normally distributed, it avoids outlying observations and issues such as econometric problem (Gregory-Allen & Shalit, 1999). Therefore, it is sufficient to identify major outlier from the normality test.

Sensitivity analysis is a technique that used to determine whether a design system falls within the area of an experiment. The sensitivity coefficient represent the percentage of effect changes on the cross sectional data (Broadhead, Rearden & Hopper, 2004). This technique is very useful in determining whether the outcome is different from the original assumptions of the actual outcome of a particular variable. According to Graham (2006), the sensitivity analysis is very useful for the assumption of additional data collection to narrow the uncertainty in the results. Sensitivity analysis is usually considered the important part of a quality of the risk assessment report.

#### 3.3.3.1 Normality Test

A normality test will be conducted which is use Jarque-Bera (JB) test to test whether the error term is normally distributed. The purpose of the normality test is to make sure that the model has met the normality assumption on the error term so that the result obtained from the model is reliable. The hypothesis for the JB Test of normality is stated as follow:

H<sub>o</sub>: Error term is normally distributed.

H<sub>1</sub>: Error term is not normally distributed.

The decision rule stated the null hypothesis (H<sub>0</sub>) can be rejected if the test statistic value is more than the critical value  $(\chi^2_{\alpha,2})$  or the P-value is less than significance level. Otherwise, do not reject H<sub>0</sub>. Next, the test statistic for the JB test is formulated as below:

$$JB = \frac{n}{6} [S^2 + \frac{1}{4} (K - 3)^2]$$

Where S = Skewness

K = Kurtosis

The null hypothesis should not be rejected to prove that the error term is normally distributed. Therefore, there is enough evidence to conclude that the model has met the normality assumption.

#### 3.3.3.2 Sensitivity Analysis

Sensitivity analysis is use to test the different outcomes of the decisions by dropping the banks randomly. This technique is important to use in testing the significant of the assumptions by finding the confidence interval for the population parameter. The level of the confidence interval that using in this study is 90%, which means that the 90% of the observed confidence interval will hold the true value of the parameter. In other words, 90% confidence interval reflects a significance level of 0.10. The changes of coefficient in the test will be recorded and explained in chapter 4. If the confidence coefficient is in the range, it means the assumption is significant; vice versa.

A line graph will be created by referring to the obtained result from confidence interval. The fluctuation of the line will then be observed and explained in the next chapter. According to the line graph, if there is a large fluctuation, it means the results are depending on certain bank and it is dependent. In contrast, if there is little fluctuation in the line graph, the results are not depending on certain bank and it is independent.

# 3.4 Conclusion

This chapter explained the data and the methodology that will be used to perform data analysis in Chapter 4. This study will employ the quantitative and secondary data as well as panel data regression model to investigate the economic factors that affecting the performance of foreign banks in Malaysia. In addition, various types of diagnostic tests will be conducted to make sure the reliability of the results. The empirical results of the statistical tests will be discussed on the next chapter.

# **CHAPTER 4: DATA ANALYSIS**

## 4.0 Introduction

This chapter presents the results of the empirical analysis which investigate the factors that affecting the performance of eight foreign banks in Malaysia during the period of 2005 until 2010. According to Chapter 3, this study will employ the quantitative and secondary data as well as panel data regression model to carry out the empirical tests. All of the empirical tests including the panel regression analysis and the diagnostic tests are conducted by using the EViews software and the results will be presented in the following sections.

#### 4.1 Scale of Measurement

#### 4.1.1 Panel Data Regression

	Pool OLS		FEM		REM	
Variables	Coefficient	Probability	Coefficient	Probability	Coefficient	Probability
LTA	0.109820	0.0725*	-0.507584	0.0558*	0.045200	0.5874
CR	0.018715	0.1233	0.017777	0.2407	0.013611	0.2495
CIR	-0.01477	0.0006***	-0.024900	0.0000***	-0.020381	0.0000***
LRGDP	0.055301	0.8595	0.666588	0.0489**	0.143107	0.5589

Table 4.1: Regression Results (Dependent Variable = ROA)

INT	-0.001246	0.9242	-0.005200	0.6060	-0.003786	0.7036
INF	0.102910	0.0287**	0.057951	0.1158	0.086214	0.0174**
CRISIS	-0.071175	0.5307	-0.047580	0.5962	-0.091437	0.2924
R-squared	0.620554		0.821785		0.602383	
Adjusted R-squared	0.554151		0.746179		0.532800	

Note: P-value in parentheses \*, \*\*, and \*\*\* indicates significant at 10%, 5%, and 1% significance level respectively

Table 4.2:	Results	for Pool	ibity Hy	pothesis	Test an	nd Hausman	Test
				1			

Poolibility Hypothesis Test	Probability = 0.0004
Hausman Test	*Invalid

There are three different types of Panel data regression model, includes Pool OLS, Fixed Effect Model (FEM), and Random Effect Model (REM). The results of these three models are shown in Table 4.1. Next, Poolibility hypothesis test and Hausman test are carried out in order to test whether which panel data regression model is appropriate for the panel data in this research, and the results are shown in Table 4.2. The Poolibility hypothesis testing is used to test whether the Pooled OLS or FEM is more appropriate to be used in this research. The probability of the test is 0.0004 which is less than the significance level of 10%, thus leads to reject the null hypothesis. This result indicates FEM is better than Pooled OLS model or there is no common intercept on all the foreign banks. In addition, Hausman test is conducted to make a decision between FEM and REM. If the probability obtained from the Huasman test is less than the significance level, it means FEM is the

appropriate choice. In this study, the Hausman test is invalid so there is no decision can be made between FEM and REM. In conclusion, this data analysis will employ Fixed Effect Model to investigate the factors that influencing the performance of foreign banks in Malaysia.

## 4.1.2 Normality Test

H<sub>o</sub>: Error term is normally distributed.

H<sub>1</sub>: Error term is not normally distributed.

In the Normally Test, the null hypothesis ( $H_0$ ) stated the error term is normally distributed while the alternative hypothesis ( $H_1$ ) stated the error term is not normally distributed. If the probability of the test is less than the p-value, the  $H_0$  can be rejected. The result shows that the  $H_0$  cannot be rejected since the probability (0.041236) is more than the P-value (0.01). It concludes that the error term is normally distributed at 1% significance level.

## 4.1.3 Sensitivity Test

Sensitivity test is used to determine whether a design system falls within the area of an experiment. Different sets of confidence interval for the variable is calculated based on the condition that one of the cross-sectional data have been dropped from the model. The formula of confidence interval is as follow:

$$\widehat{\beta_n} \pm t_{\frac{\alpha}{2}, n-k-1} \cdot se(\widehat{\beta_n})$$

From the result that obtained from the empirical analysis, there are three variables found to have significant effect on bank profitability. One of the significant variables was randomly selected to conduct the sensitivity test and observe the changes of the coefficient after one of the foreign banks has been

dropped from the model. In this study, the Cost to Income Ratio (CIR) was selected as the example. At first, the coefficient and standard error of the variable was observed from the original model, and then observed the changes of the coefficient and standard error of the variable after one of the foreign banks has been dropped from the original model. This process repeated for six times and the foreign banks were randomly selected. The changes of the coefficient and standard error were recorded in Table 4.3. This sensitivity test used 1% as the significance level and the degree of freedom is 40, which is calculated based on the formula:

Degree of freedom (d.f.) = 
$$n - k - 1$$
  
=  $48 - 7 - 1$   
=  $40$   
n = sample size  
k = number of independent variables

The t-statistic value is 2.704, which can be obtained from the t-distribution table (refer to Appendix 6) based on the significant level (1%) and the degree of freedom (40). Next, by applying each of the different coefficient value, standard error, and the t-statistic value into the Confidence Interval formula, the results are shown in the Table 4.3.

Based on the lower bound and upper bound of the confidence interval as well as the coefficient, a line graph is created to observe the fluctuation under different condition. The graph 4.1 shows the changes of confidence interval and coefficient of the cost to income ratio which is one of significant variables in this study. The results show that the coefficient and confidence interval only have little fluctuation in different model with one of the foreign banks has been dropped. The coefficient figure does not change too much from the original result even though the model has omitted one of cross-sectional data (foreign banks), indicates the coefficient does not depends on certain foreign bank and concludes that the result is independent. This provides evidence that the model has lower opportunity to suffer from the econometric problem and thus the result is reliable.

Original model/Model without one of the foreign banks below	Coefficient	Standard Error	Lower Bound	Upper Bound
Original model	-0.024900	0.004498	-0.037063	-0.012737
Citibank	-0.024736	0.004807	-0.037734	-0.011738
Bank of Tokyo-Mitsubishi UFJ	-0.024382	0.004441	-0.036390	-0.012374
Deutsche Bank	-0.025207	0.004924	-0.038521	-0.011893
UOB	-0.023236	0.004670	-0.035864	-0.010608
OCBC Bank	-0.024705	0.004893	-0.037734	-0.011738
HSBC Bank	-0.025389	0.004780	-0.037898	-0.011128

Table 4.3: Results for Sensitivity Test

Figure 4.1: Results for Sensitivity Test



# 4.2 Inferential Analysis

In Chapter 3, the regression model is stated as follow:

$$ROA = \beta_0 + \beta_1 LTA + \beta_2 CR + \beta_3 CIR + \beta_4 LRGDP + \beta_5 INT + \beta_6 INF + \beta_7 CRISIS + \varepsilon$$

Based on the results from this research, the regression model is:

$$ROA = 7.358472 - 0.219569LTA + 0.021800CR - 0.024491CIR - 0.015062LRGDP - 0.031484INT + 0.035390INF + 0.029689CRISIS$$

Dependent variable = ROA					
Independent variables	Coefficient	Probability			
LTA	-0.507584	0.0558*			
CR	0.017777	0.2407			
CIR	-0.024900	0.0000***			
LRGDP	0.666588	0.0489**			
INT	-0.005200	0.6060			
INF	0.057951	0.1158			
CRISIS	-0.047580	0.5962			
R-squared	0.821785				
Adjusted R-squared	0.746179				
F-statistic	10.86927				
Probability (F-statistic)	0.000000				

Table 4.4: Regression results of Fixed Effect Model

Table 4.4 shows the estimated parameters and P-value which obtained from the data analysis with Fixed Effect Model. The R-squared for this model is 0.821785, which indicates 82.18% of the variation in the dependent variable can be explained by the variation in the independent variables. The 17.82% of the variation in the dependent variable remain unexplained by the variation in the independent variable. The F-statistic for the model is 10.86927 and the probability is 0.00000. The F-statistic is use to test the significance of the whole model and this result concludes that this model is significant at all significant level.

#### 4.2.1 Bank Size

This result suggests that the bank size have significant negative relation with ROA, where bank size is measured by total assets of the foreign bank. This negative relationship suggests that larger (smaller) banks achieve a lower (higher) ROA. On average, the ROA is predicted to decrease by 0.005076 point as a result of 1% increase in the total assets of the foreign banks, holding other factors constant. It indicates the banks size has significant effect on profitability of the bank and the result is consistent with Pasiouras and Kosmidou (2007), Javaid, Anwar, Zaman, and Gafoor (2011), and Bourke (1989). Smaller banks tend to have better profitability performance is supported by previous research that found diseconomies of scale for larger banks or financial institutions. Pallage (1991) proved that the strong economies of scale for the small financial institutions are decreasing when the size of the institutions grow.

#### 4.2.2 Capital Ratio

The positive sign shows that there is positive relationship between foreign bank's capital and ROA. The ROA is predicted to increase by 0.0178 point as

a result of 1 point increase in the capital ratio, on average, holding other factors constant. However, the coefficient is insignificant which means bank's capital have not direct effect on bank's profit. Similar result was obtained from Gul, irshad, and Zaman (2011) and Alper and Anbar (2011) that found bank's capital is statistically insignificant to explain the determinants of bank profitability.

#### 4.2.3 Cost to Income Ratio

The cost to income ratio is statistically significant at all significant level (1%, 5%, and 10%) shows that this ratio is an important determinant of banks profitability. The empirical result suggests the cost to income ratio has negative relation with ROA. The ROA is predicted to decrease by 0.0249 point on average, for every 1 point increase in the cost to income ratio, holding other factors constant Foreign banks with higher cost to income ratio achieve higher ROA means that bank with less efficient in management earns less profit. The operating costs incurred in banks such as administrative costs, staff salaries, and other non-interest expenses have significant impact on the profitability performance of foreign banks. This result is consistent with the research of Dietrich and Wanzenried (2011), Pasiouras and Kosmidou (2007), Oladele, Sulaimon, and Akeke (2012), and Mathuva (2009).

#### 4.2.4 Real Gross Domestic Product (RGDP)

The empirical result concludes the real GDP has positive impact on bank profitability and is significant at 5% significant level. The ROA is predicted to increase by 0.006666 point as a result of 1% increase in the real GDP, on average, holding other factors constant. Bank profits seem to be pro-cyclical, which is supported by Athanasoglou, Brissimis, and Delis (2008), Gul, Irshad,

and Zaman (2011), and Demirguc-Kunt and Huizinga (1999). Foreign banks have better profitability performance during the cyclical upswings in the business cycle due to the demand for lending increases. In contrast, the profitable business will be affected during the cyclical downswings, as the demand for lending activity decreased which is cause by higher risk exposure.

#### 4.2.5 Real Interest Rate

Interest income is one of sources of income of banks which could be affected by the changes of interest rate. In this study, the result shows that there is no relationship between the real interest rate and ROA. It indicates the real interest rate has no significant impact on the profitability performance of foreign banks in Malaysia. The negative sign implies that for every 1 point increase in the real interest rate, on average, the ROA is predicted to decrease by 0.0052 point, holding other factors constant. Similar result was obtained from Alper and Anbar (2011), which found interest rate is insignificant to explain the determinants of bank profitability, as measured by ROA.

#### 4.2.6 Inflation Rate

The coefficient for the variable is positive, but it is insignificant. The positive sign implies that the ROA is predicted to increase by 0.0580 point, on average, as a result of 1 point increase in the inflation rate, holding other factors constant. This result provides evidence that inflation rate has no significant impact on the bank profitability which is consistent with the result of Naceur (2003). This may due to the foreign banks are unable to earn profits in inflationary environment. According to Athanasoglou, Brissimis, and Delis (2008), if the inflation is anticipated, the interest rate could be adjusted according to the inflation rate, and thus gain more profits. In this case, the

impact of inflation on bank profitability would be positive since the banks are able to incorporate the effect of anticipated inflation into their operational costs to enhance profits. If the inflation is unanticipated, the bank profitability could be negatively affected by inflation or the effect is less significant.

## 4.2.7 Global Financial Crisis

In this study, the global financial crisis seems has less significant affect on the profitability performance of foreign bank. This result could be supported by Sundaram (2006), suggests that Malaysia economy was less vulnerable to crisis and this may due to the economic policies implementing in Malaysia during pre-crisis and crisis period. Malaysia tend to have massive international trade before East Asia crisis, however, Malaysia's foreign liabilities seem to maintain below the foreign reserve. In addition, the author pointed out the authorities of prudence regulation on financial institution lending and borrowing policies in foreign currency does avoid banking industries from collapse. Moreover, the authorities of capital control does help in controlling the lobbying activities and provide flexibility, responsiveness and investor friendly environment to encourage foreign direct investment. In result, theses authorities have provided a protection for Malaysia from the financial crisis hit compared to other countries.

# 4.3 Conclusion

In this chapter, the results of the data analysis on the determinants of the foreign bank profitability performance in Malaysia have been reported and discussed in detail. This empirical analysis employed the E-View software to decide which of the panel data regression model is appropriate to be used in this study, and conducted the diagnostic test to make sure that the result is independent and reliable. This study provides evidence on the significance of economic factors that would have positive or negative effect on the profitability which measure by ROA. Next, this study will proceed to Chapter 5 to summarize the major findings of this research, implications of this study, and provides recommendation for future research.

# CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

## 5.0 Introduction

The aim of this chapter is to discuss and summarize the previous chapters of this study. The inferential analysis which discussed in the previous chapter will be summarized, and the major findings to validate the research objectives and hypotheses will be discussed in this chapter. Further, this section provides the practical implications for the policy makers and also discusses the limitation of the research. Lastly, the recommendations for future research will be provided in this chapter.

## 5.1 Summary of Statistical Analysis

This study employed the Fixed Effect Model to investigate the factors that affecting the performance of foreign banks in Malaysia. The independent variables used in this study consist of microeconomic factors as well as the macroeconomic factors. The empirical results in this study shows that the bank size, cost to income ratio, and real gross domestic product have impact on the bank profitability performance, while the capital ratio, interest rate, inflation, and global financial crisis found no significant impact on the profitability performance of the eight foreign banks in Malaysia. The coefficient of the bank size which measured by total assets shows a positive sign indicates smaller foreign bank earns more profits. On the other hand, this study also found that the cost to income ratio has negative effect on the profitability which means foreign bank with less efficient management achieve lower ROA. The macroeconomic factor, real GDP has positive effect on ROA, suggests that foreign bank will have better performance during cyclical upswings in the business cycle. The obtained result of the R-squared indicates 82.18% of the variation in the dependent variables can be explained by the variation in the independent variables. The 17.82% of the variation in the dependent variable remain unexplained by the variation in the independent variable. Furthermore, the obtained result of normality test indicates the error term is normally distributed which is significant at 1% significant level since the probability of the Jarque-Bera Test (0.041236) is higher than p-value (0.01). Lastly, the result for sensitivity analysis has shown in a line graph, and the movement in line has only little fluctuation. It has proved that the results of this research are not depending on certain foreign bank and are independent. These results conclude that the model in this study has lower probability to suffer from the econometric problems.

# 5.2 Discussion of Major Finding

This study shows the significances of the seven independent variables to the impact of microeconomic and macroeconomic factors on the foreign banks' performance in Malaysia.

This study used seven explanatory variables to investigate the economic factors that influencing the foreign banks' profitability performance in Malaysia. In Chapter 1, the hypothesis was stated for each of the independent variable to show whether the independent variable is significant or insignificant to affect the dependent variable which is Return on Assets ratio.

- H<sub>0</sub>: Independent variable, X does not have significant effect on the performance of foreign bank in Malaysia.
- H<sub>1</sub>: Independent variable, X has significant effect on the performance of foreign bank in Malaysia.

Where independent variable, X = bank size, capital ratio, cost to income ratio, real GDP, interest rate, inflation, and global financial crisis.

The null hypothesis can be rejected if the p-value is less than the significance level (0.01, 0.05, and 0.10). In Chapter 4, the empirical analysis for this topic has been conducted and conclusion can be made based on the obtained results. The p-value of the coefficient of log total assets, cost to income ratio, and log real GDP is less than the significance level has lead to reject the null hypothesis and concludes that the bank size, cost to income ratio, and real GDP have significant effect on the profitability performance of foreign banks in Malaysia. On the other hand, the null hypothesis for the variables such as capital ratio, interest rate, inflation, and global financial crisis has been rejected and concludes that these variables do not have significant effect on the profitability performance of foreign banks in Malaysia since the P-value of the coefficient of these variables are more the significance level.

# **5.3 Implication of the Study**

This research focus on the profitability performance of foreign banks in Malaysia which could function as evidence and knowledge for those related parties who are interested on this topic. Moreover, this study could provide further knowledge for foreign investors, policy makers, and those who interested in this area. Therefore, this section will discuss about the implication and function of this study for those related community.

Chartered Mercantile Bank of India, London and China was the first foreign commercial bank which contributes as a part of Malaysia financial system development in year 1859. Malaysia financial system had further expanded in year 1913 which is the first in Kuala Lumpur; Kwong Yik Baking Corporation. History of Malaysia financial system has proved that the financial system provided elements in attracting foreign bank to make foreign direct investment for expanding business. Hence, investment decisions usually base on several attractive elements such as profit, future potential, legal and infrastructure system. However, potential benefit, profit and cost for investing in oversea market could probably further encourage or draw back the capital investing decision.

A well developed infrastructure system has attracted many foreign banks to invest in Malaysia even though there are some legal constraints on foreign bank in branch expansion.

Hence, this study could provide further understanding about the potential of earning profit in Malaysia banking industry to the foreign investors. Foreign banks such as HSBC Bank, OCBC Bank, Standard Chartered Bank and others had performed well in Malaysian. For instance, OCBC Bank has cooperated with Great Eastern Life Assurance as partner to expand their market share. Hence, throughout the research paper foreign investors could determine the economic factors which will affect their investment capital in Malaysia. In addition, foreign investors could evaluate those foreign banks' profitability performance to estimate potential earning if they expand their business in Malaysia.

Democratic system provides three separate entities bodies, includes legislatures, judiciary and executives to regulated and ruling Malaysia independently. Even though these three entities are independent, the integration between executives, executives, and legislatures will highly increase the effectiveness of development in Malaysia. Hence, politician plays important roles in carrying their duties while align with Central Bank latest decision when making new policy. Politician gain better understanding on financial system when drafting new policies such as open door policy to attract new foreign direct investment. In result, this research paper could provide those politicians better understanding of the foreign bank's performance conveniently. Integration between legislatures and finance could be more effective while drafting new economic policies.

On the other hand, this research could provide deeper understanding for those interested in this research area such as undergraduate students for their education purpose. In addition, this research could assist those researchers who aim to examine the factors that affecting foreign direct investment of bank.

# 5.4 Limitation of the Study

One of the limitations of this study is the problem occurred in the progress of statistical analysis. Financial system in Malaysia is organized and monitor strictly by Central Bank, thus there is strictly restriction on those foreign bank to enter into the financial market. In addition, annual reports of the foreign banks for the year prior to 2005 are unable to obtain and thus, lead to limited year of observation. The purpose of collecting the annual report is to calculate the ratio based on the information reported in the financial statement. Therefore, this study only covers the period from year 2005 to 2010 for eight observations (cross-sectional data), result in smaller sample size.

On the other hand, problem in conducting data analysis is the limitation of E-View system over other type of quantitative data analysis software in performing a detail empirical analysis because the nature of panel data leads to problem in performing diagnostic checking via E-View system. Therefore, lacking of expertise and knowledge in implementing more professional data analysis software such as Stata results a challenge in performing empirical analysis for this research.

# 5.5 Recommendation for Future Research

This research only involved the economic factors that affecting foreign bank profitability. Hence, foreign direct investment does not independently depend on this factor only. This study would recommend other research to further examine other factors that probably affecting foreign bank investment such as investigates the impact of economic factors on foreign bank performance in different financial crisis period. In future, researchers could conduct a research base on financial crisis such as pre-crisis, during crisis and post-crisis period to investigate the determinants of foreign bank performance. Research on financial crisis could provide foreign bank investor a better understanding about the financial system stability in Malaysia. In addition, foreign bank investors could also analyze the ability of bank to recover from financial crisis and compare the result before and after the crisis period.

Lastly, professional and sophisticated quantitative data analysis software, Stata is recommended to be used to conduct the regression analysis and diagnostic test. This is because Stata is a complete, integrated statistical package that provides everything needed for data analysis, data, management and graphics. Moreover, Stata has hundreds of statistical tools and it is faster and more accurate than E-View.

# 5.6 Conclusion

This chapter summarized the results of statistical analysis and the major findings of this research which has the purpose of investigating the economic factors that affecting the performance of foreign banks in Malaysia for the period of 2005 to 2010. The implications and limitations of the study as well the recommendations for further research have been discussed in this chapter. This research will be presented and to be referred for further research.

#### REFERENCES

- Aebi, V., Sabato, G., & Schmid, M. (2012). Risk management, corporate governance, and bank performance in the financial crisis. *Journal of Banking & Finance*, 36, 3213-3226.
- Alam, H. M., Raza, A., & Akram, M. (2011). A financial performance comparison of public vs private banks: The case of commercial banking sector of Pakistan. *International Journal of Business and Social Science*, 2(11), 56-64.
- Alper, D. & Anbar, A. (2011). Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey. *Business and Economics Research Journal*, 2(2), 139-152.
- Arellano, M. & Bond, S. R. (1991). Some tests for specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, 58, 277-297.
- Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specific, industryspecific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions, and Money*, 18, 121-136.
- Baltagi, B. H. (2001). Econometric Analysis of Panel Data. Chichester: John Wiley & Sons
- Bashir, A. H. M. (2003). Determinants of profitability in Islamic banks: Some evidence from the Middle East. *Islamic Economic Studies*, 11(1), 31-57.
- Bennaceur, S. & Goaied, M. (2008). The determinants of commercial bank interest margin and profitability: Evidence from Tunisia. *Frontiers in Finance and Economics*, 5(1), 106-130.
- Berger, A. N. (1995). The relationship between capital and earnings in banking. Journal of Money, Credit and Banking, 27(2), 432-456.
- Berger, A. N. & Bouwman, C. H. S. (2012). How does capital affect bank performance during financial crises? *Journal of Financial Economics*, Forthcoming.

- Berger, A. N., Bonime, S. D., Covitz, D. M., & Hancock, D. (2000). Why are bank profits so persistent? The roles of product market competition, informational opacity, and regional/macroeconomic shock. *Journal of Banking and Finance*, 24(7), 1203-1235.
- Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal of banking and Finance*, 13, 65-79.
- Boyd, J. H., Levine, R., & Smith, B. D. (2000). The impact of inflation on financial sector performance. Retrieved July 29, 2012, from http://ideas.repec.org/a/eee/moneco/v47y2001i2p221-248.html
- Broadhead, B. L., Rearden, B. T., & Hopper, C. H. (2004). Sensitivity- and Uncertainty-Based Criticality Safety Validation Techniques. *Nuclear Science and Engineering*, 146, 340-366.
- Bukhari, S. A. J. & Qudous, R. A. (2012). Internal and external determinants of profitability of banks. Evidence from Pakistan. *Interdisciplinary Journal of Contemporary Research Business*, 3(9), 1037-1058.
- Chan, S. G. & Karim, M. Z. A. (2011). Efficiency of foreign banks: Evidence from selected (Association of Southeast Asian Nations) ASEAN countries. *African Journal of Business Management*, 5(14), 5617-5626.
- Claessens, S., Demirguc-Kunt, A, & Huizinga, H. (2000). How does foreign entry affect domestic banking markets? Retrieved July 27, 2012, from http://siteresources.worldbank.org/DEC/Resources/84797-1114437274304/final.pdf
- Demirguc-Kunt, A. & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: Some international evidence. *The World Bank Economic Review*, 13(2), 379-408.
- Derbali, A. (2011). Determinants of banking profitability before and during the financial crisis of 2007: The case of Tunisian banks. *Interdisciplinary Journal Contemporary Research in Business*, 3(3), 1256-1269.
- Detragiache, E. & Gupta, P. (2006). Foreign banks in emerging market crises: Evidence from Malaysia. *Journal of Financial Stability*, 2, 217-242.

- Diamond, D. W. & Dybvig, P. H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of Political Economy*, 91(3), 299-314.
- Dietrich, A. & Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. *Journal of International Financial Markets, Institutions & Money*, 21, 307-327.
- Graham, J. (2006). Office of Management and Budget. Proposed Risk Assessment Bulletin.
- Gregory-Allen, R. B. & Shalit, H. (1999). The estimation of systematic risk under differentiated risk aversion: A mean-extended Gini approach. *Review of Quantitative Finance and Accounting*, 12, 135-157.
- Gul, S., Irshad, F., & Zaman, K. (2011). Factors affecting bank profitability in Pakistan. *The Romanian Economic Journal*, 39, 61-87.
- Heffernan, S. A. & Fu, X. (2010). Determinants of financial performance in Chinese banking. *Applied Financial Economics*, 20, 1585-1600.
- Javaid, S., Anwar, J., Zaman, K., & Gafoor, A. (2011). Determinants of bank profitability in Pakistan: Internal factor analysis. *Mediterranean Journal of School Sciences*, 2(1), 2039-2117.
- Khrawish, H. A. (2011). Determinants of Commercial Banks performance: Evidence from Jordan. *International Research journal of Finance and Economics*, (81), 148-159.
- Kosmidou, K., Pasioras, F., & Tsaklanganos, A. (2007). Domestic and multinational determinants of foreign bank profits: The case of Greek banks operating abroad. *Journal of Multinational Financial Management*, 17, 1-15.
- Kumbirai, M & Webb, R. (2010). A financial ratio analysis of commercial bank performance in South Africa. *African Review of Economics and Finance*, 2(1), 30-53.

- Lindblom, T. & Willesson, M. (2011). Financial crisis and EU banks' performance. Retrieved July 30, 2012, from http://www.google.com.my/url?sa=t&rct=j&q=financial%20crisis%20and%20e u%20banks%E2%80%99%20performance%20lindblom&source=web&cd=3&s qi=2&ved=0CE4QFjAC&url=http%3A%2F%2Fgul.gu.se%2Fpublic%2Fpp%2 Fpublic\_file\_archive%2Farchive.html%3FpublishedItemId%3D18020777%26c ourseId%3D47922%26fileId%3D18219017&ei=2BRPUf-3D8ezrAe9iIGYCg&usg=AFQjCNHQ-AGTmOyxpCQcMOKxlm1X-8Cslg&bvm=bv.44158598,d.bmk&ccad=rja
- Manning, W. G. & Mullahy, J. (2001). Estimating log models: to transform or not to transform. *Journal of Health Economics*, 20, 461-494.
- Mathuva, D. M. (2009). Capital adequacy, cost income ratio and the performance of commercial banks: The Kenya scenario. *The International Journal of Applied Economics and Finance*, 3(2), 35-47.
- Naceur, S. B. (2003). The determinants of the Tunisian banking industry profitability: Panel evidence. Retrieved July 28, 2012, from http://www.mafhoum.com/press6/174E11.pdf
- Oladele, P. O., Sulaimon, A. A., & Akeke, N. I. (2012). Determinants of bank performance in Nigeria. *International Journal of Business and Management Tomorrow*, 2(2), 1-4.
- Ong, T. S., Lim, Y. T., & Teh, B. H. (2011). A comparison on efficiency of domestic and foreign banks in Malaysia: A DEA approach. *Business Management Dynamics*, 1(4), 33-49.
- Pak H. S. & Huh, S. K. (2010). Comparative analysis of Koreans' performance. StudyMode.com. Retrieved July 29, 2012, from http://www.studymode.com/essays/Korean-Bank-Performance-418469.html?topic
- Pallage, S. (1991). An econometric study of the Belgian Banking sector in terms of scale and scope economies. *Cahiers Economiques de Bruxelles*, 130.
- Pasiouras, F. & Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in European Union. *Research in International Business and Finance*, 21, 222-237.
- Ramlall, I. (2009). Bank-specific, industry-specified and macroeconomic determinants of profitability in Taiwanese banking system: Under panel data estimation. *International Research journal of Finance and Economics*, (34), 160-167.
- Rasiah, D. (2010). Theoretical framework of profitability as applied to commercial banks in Malaysia. *European Journal of Economics, Finance and Administrative Sciences*, (19), 74-97.
- Said, R. M. & Tumin, M. H.(2011). Performance and financial ratios of commercial banks in Malaysia and China. *International Review of Business Research Papers*, 7(2), 157-169.
- Samuelson, P. A. (1945). The effect of interest rate increases on the banking system. *The American Economic Review*, 35(1), 16-27.
- Shaher, T. A., Kasawneh, O. & Salem, R. (2011). The major factors that affect banks' performance in Middle Eastern countries. *Journal of Money, Investment and Banking*, (20), 101-109.
- Smirlock, M. (1985). Evidence on the (Non) relationship between concentration and profitability in banking. *Journal of Money, Credit and Banking*, 17(1), 68-83.
- Stiroh, K. & Rumble, A. (2006). The dark side of diversification: The case of US financial holding companies. *Journal of Banking and Finance*, 30, 2131-2161.
- Sturm, J. & Williams, B. (2004). Foreign bank entry, deregulation and bank efficiency: lessons from the Australian experience. *Journal of Banking & Finance*, 28, 1775-1799.
- Sufian, F. & Habibullah, M. S. (2010). Does economic freedom fosters banks' performance? Panel evidence from Malaysia. *Journal of Contemporary Accounting & Economics*, 6, 77-91.
- Sundaram, J. L. (2006). Pathways through financial crisis: Malaysia. *Global Governance*, 12, 489-505.
- Williams, B. (2003). Domestic and international determinants of bank profits: Foreign banks in Australia. *Journal of Banking and Finance*, 27, 1185-1210.

# APPENDICES

## Appendix 1: Results of Pooled OLS Model

Dependent Variable: Y\_? Method: Pooled Least Squares Date: 04/11/13 Time: 13:59 Sample: 2005 2010 Included observations: 6 Cross-sections included: 8 Total pool (balanced) observations: 48

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	-1.970172	4.170433	-0.472414	0.6392
LX1_?	0.109820	0.059539	1.844490	0.0725
X2_?	0.018715	0.011888	1.574281	0.1233
X3_?	-0.014777	0.003947	-3.743599	0.0006
LX4_?	0.055301	0.310466	0.178121	0.8595
X5_?	-0.001246	0.013012	-0.095744	0.9242
X6_?	0.102910	0.045344	2.269570	0.0287
X7_?	-0.071175	0.112535	-0.632465	0.5307
R-squared	0.620554	Mean dependent	var	1.271206
Adjusted R-squared	0.554151	S.D. dependent	var	0.426813
S.E. of regression	0.284991	Akaike info criterion		0.478296
Sum squared resid	3.248804	Schwarz criterion		0.790163
Log likelihood	-3.479109	Hannan-Quinn criter.		0.596151
F-statistic	9.345271	Durbin-Watson stat		2.129687
Prob(F-statistic)	0.000001			

# Appendix 2: Results of Fixed Effect Model

Dependent Variable: Y_?					
Method: Pooled Least Squares					
Date: 04/11/13 Time: 14:03					
Sample: 2005 2010					
Included observations: 6					
Cross-sections included: 8					
Total pool (balanced) observations: 48					

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	5.118855	4.365078	1.172684	0.2493
LX1_?	-0.507584	0.256027	-1.982541	0.0558
X2_?	0.017777	0.014878	1.194861	0.2407
X3_?	-0.024900	0.004498	-5.535771	0.0000
LX4_?	0.666588	0.325950	2.045062	0.0489
X5_?	-0.005200	0.009985	-0.520768	0.6060
X6_?	0.057951	0.035883	1.614990	0.1158
X7_?	-0.047580	0.088920	-0.535086	0.5962
Fixed Effects (Cross)				
HSBCC	0.793804			
OCBCC	0.294931			
STDC	0.315142			
CITIC	0.624014			
UOBC	0.036837			
DEUTC	-0.602804			
TOKYOC	-0.950541			
RBSC	-0.511384			
Effects Specification				

Cross-section fixed (dummy variables)

R-squared	0.821785	Mean dependent var	1.271206
Adjusted R-squared	0.746179	S.D. dependent var	0.426813
S.E. of regression	0.215031	Akaike info criterion	0.014241
Sum squared resid	1.525870	Schwarz criterion	0.598991
Log likelihood	14.65822	Hannan-Quinn criter.	0.235219
F-statistic	10.86927	Durbin-Watson stat	3.384359
Prob(F-statistic)	0.000000		

### Appendix 3: Results of Random Effect Model

Dependent Variable: Y\_? Method: Pooled EGLS (Cross-section random effects) Date: 04/11/13 Time: 14:05 Sample: 2005 2010 Included observations: 6 Cross-sections included: 8 Total pool (balanced) observations: 48 Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	-1.223466	3.263065	-0.374944	0.7097
LX1_?	0.045200	0.082620	0.547091	0.5874
X2_?	0.013611	0.011647	1.168660	0.2495
X3_?	-0.020381	0.003723	-5.474727	0.0000
LX4_?	0.143107	0.242778	0.589458	0.5589
X5_?	-0.003786	0.009880	-0.383228	0.7036
X6_?	0.086214	0.034747	2.481203	0.0174
X7_?	-0.091437	0.085708	-1.066844	0.2924
Random Effects (Cross)				
HSBCC	0.245689			
OCBCC	-0.066539			
STDC	-0.049051			
CITIC	0.216164			
UOBC	-0.194458			
DEUTC	-0.099952			
TOKYOC	-0.104247			
RBSC	0.052394			
	Effects Sp	pecification		
			S.D.	Rho
Cross-section random			0.169465	0.3831
Idiosyncratic random			0.215031	0.6169
	Weighted	I Statistics		
R-squared	0 602383	Mean dependent va	ar	0 584713
Adjusted R-squared	0.532800	S D dependent var	A1	0.304713
S E of regression	0.234651	Sum squared resid		2 202452
F-statistic	8 657030	Durhin-Watson stat		2.202402
Prob(F-statistic)	0.000002			2.001700
	0.000002			
	Unweighte	ed Statistics		
R-squared	0.586917	Mean dependent va	ar	1.271206
Sum squared resid	3.536804	Durbin-Watson stat		1.763423

## Appendix 4: Results of Poolibility Hypothesis Testing

#### Redundant Fixed Effects Tests Pool: FEM Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.323127	(7,33)	0.0004
Cross-section Chi-square	36.274652	7	0.0000

Cross-section fixed effects test equation: Dependent Variable: Y\_? Method: Panel Least Squares Date: 04/11/13 Time: 14:08 Sample: 2005 2010 Included observations: 6 Cross-sections included: 8 Total pool (balanced) observations: 48

	Coefficient	Std. Error	t-Statistic	Prob.
С	-1.970172	4.170433	-0.472414	0.6392
LX1_?	0.109820	0.059539	1.844490	0.0725
X2_?	0.018715	0.011888	1.574281	0.1233
X3_?	-0.014777	0.003947	-3.743599	0.0006
LX4_?	0.055301	0.310466	0.178121	0.8595
X5_?	-0.001246	0.013012	-0.095744	0.9242
X6_?	0.102910	0.045344	2.269570	0.0287
X7_?	-0.071175	0.112535	-0.632465	0.5307
R-squared	0.620554	Mean dependent	tvar	1.271206
Adjusted R-squared	0.554151	S.D. dependent	var	0.426813
S.E. of regression	0.284991	Akaike info criterion		0.478296
Sum squared resid	3.248804	Schwarz criterion		0.790163
Log likelihood	-3.479109	Hannan-Quinn criter.		0.596151
F-statistic	9.345271	Durbin-Watson s	tat	2.129687
Prob(F-statistic)	0.000001			

### Appendix 5: Results of Hauman Test

Correlated Random Effects - Hausman Test Pool: FEM Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	7	1.0000

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

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LX1_?	-0.507584	0.045200	0.058724	0.0225
X2_?	0.017777	0.013611	0.000086	0.6527
X3_?	-0.024900	-0.020381	0.000006	0.0734
LX4_?	0.666588	0.143107	0.047302	0.0161
X5_?	-0.005200	-0.003786	0.000002	0.3278
X6_?	0.057951	0.086214	0.000080	0.0016
X7_?	-0.047580	-0.091437	0.000561	0.0641

Cross-section random effects test equation: Dependent Variable: Y\_? Method: Panel Least Squares Date: 04/11/13 Time: 14:13 Sample: 2005 2010 Included observations: 6 Cross-sections included: 8 Total pool (balanced) observations: 48

	Coefficient	Std. Error	t-Statistic	Prob.
С	5.118855	4.365078	1.172684	0.2493
LX1_?	-0.507584	0.256027	-1.982541	0.0558
X2_?	0.017777	0.014878	1.194861	0.2407
X3_?	-0.024900	0.004498	-5.535771	0.0000
LX4_?	0.666588	0.325950	2.045062	0.0489
X5_?	-0.005200	0.009985	-0.520768	0.6060
X6_?	0.057951	0.035883	1.614990	0.1158
X7_?	-0.047580	0.088920	-0.535086	0.5962

Effects Specification					
Cross-section fixed (dumm	Cross-section fixed (dummy variables)				
R-squared Adjusted R-squared S.E. of regression Sum squared resid Log likelihood F-statistic Prob(F-statistic)	0.821785 0.746179 0.215031 1.525870 14.65822 10.86927 0.000000	Mean dependent var S.D. dependent var Akaike info criterion Schwarz criterion Hannan-Quinn criter. Durbin-Watson stat	1.271206 0.426813 0.014241 0.598991 0.235219 3.384359		





Page 66 of 66