DETERMINANTS OF RETURN ON ASSET: THE CASE OF LOCAL CONVENTIONAL BANKS IN MALAYSIA

By

YEOH CHOW YONG

Thesis Submitted to

Othman Yeop Abdullah Graduate School of Business,

Universiti Utara Malaysia,

in Partial Fulfillment of the Requirement for the Master of Sciences (Banking)

Pusat Pengajian Ekonomi,
Kewangan dan Perbankan
SCHOOL OF ECONOMICS, FINANCE, AND BANKING
Universiti Utara Malaysia

PERAKUAN KERJA KERTAS PENYELIDIKAN
(Certification of Research Paper)

Saya, mengaku bertandatangan, memperakukan bahawa
(I, the undersigned, certified that)
YEOH CHOW YONG (818136)

Calon untuk Ijazah Sarjana
(Candidate for the degree of)
MASTER OF SCIENCE (BANKING)

telah mengemukakan kertas penyelidikan yang bertajuk
(has presented his/her research paper of the following title)

DETERMINANTS OF RETURN ON ASSET: THE CASE OF LOCAL CONVENTIONAL BANKS IN MALAYSIA

Seperti yang tercatat di muka surat tajuk dan kulit kertas penyelidikan
(as it appears on the title page and front cover of the research paper)

Bahawa kertas penyelidikan tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan.
(that the research paper acceptable in the form and content and that a satisfactory knowledge of the field is covered by the dissertation).

Nama Penyelia (Name of Supervisor) : **PROF. DR. ROSYLIN MOHD YUSOF**

Tandatangan (Signature) : _____

Tarikh (Date) : **14 AUGUST 2018**

PERMISSION TO USE

In presenting this dissertation/project paper in partial fulfillment of the requirements for a Post Graduate degree from the Universiti Utara Malaysia (UUM), I agree that the Library of this university may make it freely available for inspection. I further agree that permission for copying this dissertation/project paper in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor(s) or in their absence, by the Dean of Othman Yeop Abdullah Graduate School of Business where I did my dissertation/project paper. It is understood that any copying or publication or use of this dissertation/project paper parts of it for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the UUM in any scholarly use which may be made of any material in my dissertation/project paper.

Request for permission to copy or to make other use of materials in this dissertation/project paper in whole or in part should be addressed to:

Dean of Othman Yeop Abdullah Graduate School of Business
Universiti Utara Malaysia
06010 UUM Sintok
Kedah Darul Aman

ABSTRACT

The topic of what factor determines financial performance of bank has always gain interest from many parties such as investor, central bank regulator and among bankers itself. Figures from financial statement not only contain bank's information from the past but also could provide hint on their likely future performance hence the purpose of this study is to identify the determinants of the financial performance of local banks in Malaysia where financial performance is measured by using return on asset. Independent variables included in this study are non-interest expense to total asset ratio (expense management), impairment ratio, risk appetite, gross domestic product, and inflation. By employing fixed effect panel data regression on data period of year 2002 – 2016, the results suggested that non-interest expense to total asset ratio, impairment ratio, and risk appetite have significant relationship with return on asset. This therefore indicates that the impact of external determinants such as gross domestic product and inflation on return on asset is not as great as the impact of internal determinants such as expense management, impairment ratio, and risk appetite. In line with initiative of Financial Sector Blue Print 2011 – 2020 issued by Bank Negara Malaysia, this study helps to strengthen the stability of financial institution by identifying key risk factor that would cause deterioration of financial performance together with mitigation plan of such risk.

Key Words: Financial Performance, Fixed Effect Panel Data Regression, Impairment Ratio, Risk Appetite, Non-Interest Expense to Total Asset Ratio

ABSTRAK

Faktor yang menentukan prestasi kewangan institutsi perbankan selalu mendapat perhatian daripada banyak pihak terutamanya pihak pelabur, bank pusat, dan jurubank. Penyata kewangan bank bukan sahaja mengandungi informasi lampau tetapi juga mengandungi petunjuk-petunjuk untuk kebarangkalian prestasi masa depan. Oleh itu, tujuan kajian ini adalah untuk mencari faktor-faktor yang menentukan prestasi kewangan bagi bank-bank tempatan di Malaysia. Kadar pulangan aset digunakan untuk mengukur prestasi kewangan bank dalam kajian ini. Pembolehubah bebas yang diambil kira termasuk nisbah perbelanjaan bukan faedah kepada jumlah asset (pengurusan perbelanjaan), nisbah hutang lapuk, kadar kecenderungan risiko, keluaran dalam negara kasar, dan kadar inflasi. *Fixed Effect Panel Data Regression* telah digunakan pada data bagi tempoh 2002 hingga 2016. Keputusan regresi menunjukan bahawa kemampuan pengurusan perbelanjaan, nisbah hutang lapuk, dan kadar kecenderungan risiko adalah signifikan dengan kadar pulangan aset. Keputusan ini juga menunjukan bahawa impak daripada faktor luar kawalan bank seperti faktor ekonomi adalah tidak sebesar impak daripada nisbah hutang lapuk, pengurusan perbelanjaan, dan kadar kecenderungan risiko. Selari dengan initiatif Pelan Induk Sektor Kewangan keluaran Bank Negara Malaysia, keputusan kajian ini membantu dalam transformasi sektor kewangan melalui langkah-langkah seperti mengenal pasti faktor yang menyebabkan kemerosotan prestasi kewangan institusi perbankan dan cara pengurusan risiko ini.

Kata Kunci: Prestasi Kewangan Bank, Pelan Induk Sektor Kewangan, Nisbah Hutang Lapuk, Kadar Kecenderungan Risiko, Pengurusan Perbelanjaan

ACKNOWLEDGEMENT

I would like to take this opportunity to thanks all parties that has assisted me in completing the thesis especially my supervisor, Prof. Dr. Rosylin Binti Mohd Yusof for her continuous guidance and contribution throughout this project paper. Without her knowledgeable supervision, it would be almost impossible for me able to complete this paper. Those who had also given support and help in this paper, I would like to thank you for your helping hands.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE
INTRODUCTION

1.0 Introduction

As early as 1994, the famous Bill Gates quotes “Banking is necessary, banks are not” raised the question on whether brick and mortar bank would continue to exist in the future. In Malaysia, local conventional banks continue to suffer from low net interest spreads while facing stiff competition from competitors and also from non-banking institutions which many affect the sustainability of local banking institutions. Recently, conventional banks are focusing more on digital innovation in order to cut cost on human resources. This is not just because slow evolving bank would be easily discarded by tech-savvy customers but also because further digitalization would give advantage in long term cost saving. Besides, banks are burdened by more stringent regulation taken into place which increased compliance cost. For instance, under Personal Data Protection Act (PDPA), banks are required to perform verification before releasing customer information to legitimate third party or referring the case back to the customer itself. This act indirectly creates extra administrative cost to the bank. Banks need to be particularly careful in compliance requirements as non-compliance action would lead to heavy penalty from regulator and compromising on the reputation of the bank. In addition, with the implementation of Malaysia financial reporting standards 9 which took effect in Jan2018, Malaysian banks are very likely required to provide higher impairment provision which would further decrease the bank’s earning. With such challenging and highly regulated banking environment, it is imperative to study the main determinants of financial performance of these local banks under the new environment

to shed some light on the future sustainability Although this study is highly similar to existing literature that studied on the financial performance of bank, the research technique used is relatively new which is fixed effect regression model. Besides, an innovative variable derived using risk weighted asset / total asset as a proxy to risk appetite level is included in addition to other common variables for this study.

1.0.1 Overview of Banking Sector in Malaysia

Brimble et al. (2011) stated that there are many types of financial intermediaries coexist in the economy and each financial intermediary plays a major role in a country's economy growth. In Malaysia, there are three main categories of banks namely Commercial Bank, Investment Bank and Islamic Bank. Out of which, commercial bank is the largest component, accounting for approximately 75-80 percent of total assets of Malaysia's banking system (Refer Table 1.1). Despite the increase in the asset size of commercial banks in each year, the magnitude of expansion is smaller compared to those of Islamic banks. For instance, as evident in Table 1.1, the growth rate of total assets of Islamic banks surpassed the growth rates of conventional banks for the period running from Jan 2011-Jan 2016.

Table 1.1
Banking System: Statement of Assets

Period	Type of Asset	Total Asset Amount (RM Million)	% of Total Asset	Percentage of Growth
Jan 2010	Commercial Banks	1,107,292.49	79.57%	N/A
	Islamic Banks	222,288.96	15.97%	N/A
	Investment Banks	62,046.45	4.46%	N/A

Jan 2011	Commercial Banks	1,222,064.07	79.23%	10.37%
	Islamic Banks	256,213.34	16.61%	15.26%
	Investment Banks	64,201.88	4.16%	3.47%
Jan 2012	Commercial Banks	1,369,522.03	77.78%	12.07%
	Islamic Banks	322,151.74	18.30%	25.74%
	Investment Banks	69,143.56	3.93%	7.7%
Jan 2013	Commercial Banks	1,467,376.77	77.28%	7.15%
	Islamic Banks	369,785.09	19.48%	14.79%
	Investment Banks	61,547.92	3.24%	-10.99%
Jan 2014	Commercial Banks	1,567,945.29	76.80%	6.85%
	Islamic Banks	417,314.13	20.44%	12.85%
	Investment Banks	56,332.10	2.76%	-8.47%
Jan 2015	Commercial Banks	1,714,717.09	76.12%	9.36%
	Islamic Banks	477,268.08	21.19%	14.37%
	Investment Banks	60,587.88	2.69%	7.55%
Jan 2016	Commercial Banks	1,787,475.94	75.52%	4.24%
	Islamic Banks	527,129.32	22.27%	10.45%
	Investment Banks	52,224.97	2.21%	-13.80%

Source: Bank Negara Malaysia, 2016

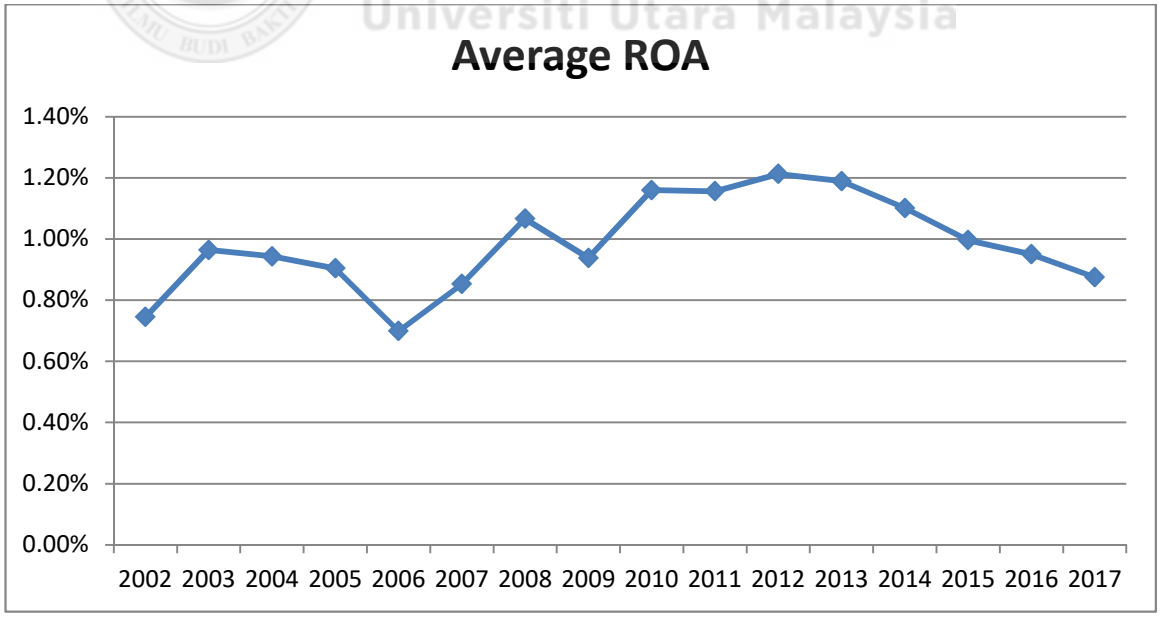
According to Hull (2010), most large banks engage in both investment and commercial banking. The primary role of Investment banking is to provide corporate services such as engaging in business of assisting companies in raising debt and equity, and providing advice on mergers and acquisitions (M&A), major corporate debt restructurings, and other corporate finance decisions. On the retail side, investment banks are often involved

in securities trading such as providing brokerage service in stock market. In contrast, commercial and Islamic banks focus on retail operation where the main services provided are deposit taking and lending to the public. The distinct different between commercial bank and Islamic bank is Islamic banks' operation is based on principles of Shariah.

1.0.2 Financial Performance and Global Financial Crisis (2007 – 2008)

Local conventional bank in Malaysia is experiencing difficulty in maintaining financial performance in recent years due to challenging operating landscape. This can be evidence in Figures 1.1 below that showing continuous decreasing average return on asset (ROA) from year 2012 until 2017.

Figures 1.1
Average Return on Asset for all Malaysian Conventional Bank



Banking sector is considered as the core of financial system, as they act as an intermediary between deficit spending units and surplus spending units. Any mismanagement of the banking industry or inefficiency in role of financial intermediaries would easily disrupt the whole financial system and could adversely affect the economy. Therefore, it is utmost important to have a stable and strong financial system in order to prevent any crisis that is arising from financial sector. An example of which is during the period of year 2007 – 2008, subprime mortgage crisis in the United States has led to global economic recession that is most severe since the Great Depression of the 1930s. In Malaysia, global financial crisis has led to annual GDP growth for year 2009 to drop to -7.36% for the first time since year 1998 (Refer table 1.2)

Table 1.2
Malaysia GDP growth (Annual %)

YEAR	GDP growth (Annual %)
1995	9.83
1996	10.00
1997	7.32
1998	-7.36
1999	6.14
2000	8.86
2001	0.52
2002	5.39
2003	5.79
2004	6.78
2005	5.33
2006	5.58
2007	6.30
2008	4.83
2009	-1.51
2010	7.43

2011	5.29
2012	5.47
2013	4.71
2014	5.99
2015	4.95

Source: World Bank Data, 2016

Bessis (2010) stated that the global financial crisis during year 2007-2008 was a system-wide crisis where the amplitude is unprecedented. It is so systemic that the effect extends to the most of the country in the world. By common knowledge, the sub-prime mortgage crisis should have been contained within the United States. However, the crisis expanded through traditional contagions, which is the contamination by a local event to another place outside from United States. The effect of this event is called procyclical effects. Procyclical effect is a term commonly used to describe how an economic quantity is related to economic fluctuations.

The table below lists out all commercial banking business licensed by central bank regulator as at 17th July 2018.

1.0.3 List of Licensed Commercial Banking Business in Malaysia

Table 1.3

List of Licensed Commercial Banking Business in Malaysia and their type of ownership

No.	Name	Ownership
1	Affin Bank Berhad	Local
2	Alliance Bank Malaysia Berhad	Local
3	AmBank (M) Berhad	Local
4	BNP Paribas Malaysia Berhad	Foreign
5	Bangkok Bank Berhad	Foreign
6	Bank of America Malaysia Berhad	Foreign
7	Bank of China (Malaysia) Berhad	Foreign

8	CIMB Bank Berhad	Local
9	China Construction Bank (Malaysia) Berhad	Foreign
10	Citibank Berhad	Foreign
11	Deutsche Bank (Malaysia) Berhad	Foreign
12	HSBC Bank Malaysia Berhad	Foreign
13	Hong Leong Bank Berhad	Local
14	India International Bank (Malaysia) Berhad	Foreign
15	Industrial and Commercial Bank of China (Malaysia) Berhad	Foreign
16	J.P. Morgan Chase Bank Berhad	Foreign
17	MUFG Bank (Malaysia) Berhad	Foreign
18	Malayan Banking Berhad	Local
19	Mizuho Bank (Malaysia) Berhad	Foreign
20	National Bank of Abu Dhabi Malaysia Berhad	Foreign
21	OCBC Bank (Malaysia) Berhad	Foreign
22	Public Bank Berhad	Local
23	RHB Bank Berhad	Local
24	Standard Chartered Bank Malaysia Berhad	Foreign
25	Sumitomo Mitsui Banking Corporation Malaysia Berhad	Foreign
26	The Bank of Nova Scotia Berhad	Foreign
27	United Overseas Bank (Malaysia) Bhd.	Foreign

Source: Bank Negara Malaysia (2018)

According to table 1.3, there are a total of 27 licensed commercial banks in Malaysia. Out of which, 8 commercial banks are locally owned while 19 is owned by foreigners.

1.1 Problem Statement

One of the biggest downside risks of performance of conventional banking is contagion effect. Contagion effect is a chain level effect in which failures of weak banks lead to social panics and consequential failures of otherwise healthy banks.

Sound banking risk management practice by both the bank management and BNM (Central Bank of Malaysia) would certainly help to prevent the crisis while creating sustainable banking performance. However, it is difficult to strike a balance between

reducing risk and maximizing return in modern banking environment. As such, the correct determinants of local bank's financial performance will be an essential guidance for bankers to make the right decision in managing risk. In addition, it could preempt regulator to make closer monitoring to those soon to be under-performed bank. For instance, if impairment ratio is found to be highly correlated with financial performance of bank then BNM should perform preemptive action immediately on the bank that reported sudden hike in impairment ratio. From bankers' point of view, if minimise impairment ratio would maximise profit return then bankers should manage their asset portfolio by shifting into lower risk assets such as mortgages.

In the context of academic research, study of the determinants of financial performance of conventional banks in Malaysia by using panel data model and panel unit root test is relatively new.

1.2 Research Questions

What are the main determinant(s) of financial performance of conventional bank in Malaysia?

It is intuitive to think that as economic grow rapidly, the greater the demand of financing to support growth of economy hence increasing profit of bank. In addition, loan loss expense of the bank will be reduced as borrower less likely to default on loan repayment during economy upturn. However, do macroeconomic indicators significantly influence the financial performance of conventional banks?

1.3 Research Objectives

The aim of this study is to examine the determinants of financial performance of the conventional banks in Malaysia. With the latest findings from this research, several suggestions would be made that could help to improve the financial performance of conventional banks. In the long run, by maintaining the performance of local banks, indirectly, the stability of financial sector is strengthened in Malaysia. In addition, the objective of this study is in line with the initiative of Financial Sector Blue Print 2011 – 2020 issued by Bank Negara Malaysia which aims to safeguard the stability of the financial system.

1.4 Significance of the study

This study provides Bank Negara Malaysia (BNM) and bankers in local conventional banks to understand the effects of the major factors influencing the performance of local conventional banks in Malaysia. The statistical model built in this study could shed some light on the part of early warning system for regulators to identify emerging financial problems in banking organization.

As a result of ever increasing cost of banking business and reducing market share mentioned above, conventional bankers would be required to streamline their business strategy to remain competitive as well as sustainable. The underlying answer to the best business strategy for conventional banks could be obtained by identifying and assessing the determinants of financial performance.

Since most of the conventional bank in Malaysia is listed in Bursa Malaysia therefore investors who have interest to purchase shares of conventional banks could use the results from this study to make strategic investment decisions.

1.5 Scope and Limitations of the Study

The study is limited to only domestic (locally incorporated) conventional banks in Malaysia which excludes foreign conventional bank, Investment banks and Islamic banks. This study is also limited in scope of data which is only fifteen years from year 2002 to year 2016. Internal variable used in this study is also limited to quantitative variable publically available in bank's annual report. By focusing on financial performance of domestic conventional banks in Malaysia, the results of the study could hopefully shed some light on focusing the significant variables to promote financial performance for future sustainability of these banks.

1.6 Organization of the thesis

This study is divided into five parts. Chapter one introduces the background of the study, the problem statement, research questions, research objectives, the significance and the scope of the study. Chapter two will present the literature review on bank performance evaluation and return on equity model. Chapter three examines the theoretical framework and methodology adopted for the study in terms of the model specification, methods of estimation, data collection and instrument, and the development hypotheses to be tested.

Chapter four presents empirical results together with the interpretation. The last chapter will consist of several recommendations based on empirical results from chapter four and conclusion.

CHAPTER TWO
THEORETICAL UNDERPINNINGS AND LITERATURE REVIEW

2.0 Introduction

Chapter 2 clarifies and describes various definition, related concept and theories of banking performance model.

2.1 Conventional Banks as a Financial Intermediaries

Conventional bank is one of the financial institutions that perform financial intermediation function. Financial intermediation function involves the process of channeling excess capital from surplus spending unit (SSU) to deficit spending unit (DSU). Conventional banks would accept the excess capital from SSU through various type of deposit such as saving deposit, fixed deposit etc. On the other hand, conventional banks would channel out the excess capital through lending to DSU. This process is called financial intermediation process while money channelled out by conventional banks is called credit money.

In bank balance sheet, the deposit received from DSU will appear as liability of the bank while loans granted out to DSU will appear as the asset to the bank. The higher the interest charged by conventional bank in its asset, the higher profit conventional bank would receive. Meanwhile, the higher the interest given by conventional bank in its deposit account, the more cost it would have incurred. Generally, the difference between loan interest charged by conventional bank and deposit interest given by conventional bank is the bank's net interest margin. For instance, customer A held fixed deposit with conventional bank ABC and receive deposit interest of 3% and then conventional bank

ABC advances out the money to customer B through mortgage that charged loan interest of 5%. The difference of 5% and 3% which is 2% will be the net interest margin. By repeating this process to large amount of customer, bank would able to create profit after deducting other expenses such as operating cost and bad debt unrecovered. The better the conventional bank's ability to repeat the process with lower operating cost and lower amount of bad debt unrecovered, the better the performance of conventional bank.

2.2 Theoretical Underpinnings

The following section critically discuss on some of the existing method in evaluating financial performance of banks. By looking into existing method of how to evaluate bank's financial performance, a broader overview of what is the best indicator to financial performance will be obtained.

2.2.1 Return on Equity Model

In 1972, David Cole introduced a set of procedures for evaluating bank performance via ratio analysis using return on equity model (ROE) model. This model enables an analyst to evaluate the source and magnitude of bank profits relative to selected risk taken. (Koch and MacDonald, 2010)

The decomposition of ROE model will relate ROE to both ROA and financial leverage ratio where

ROE = Net Income / Average total equity

Based on above equation, the linkage between ROA and ROE can be seen clearly after adding average total asset into the first equation, via following formula:

$$ROE = \frac{Net\ Income}{Average\ total\ assets} \times \frac{Average\ total\ assets}{Average\ total\ equity} = ROA \times EM$$

A larger equity multiplier (EM) indicates a larger amount of debt financing relative to stockholder's equity. As such, EM measures financial leverage and represents both a profit and risk measure. Assuming the following scenario:

Bank A's ROE = $ 1 million / $ 10 million = 10%

Bank B's ROE = $ 1 million / $ 5 million = 20%

Both Bank A and Bank B is showing equal amount of net income, but average total equity of Bank B is only half of Bank A. By dividing net income by average total equity, Bank B outperformed Bank A as the ROE is double of Bank A. However, there are always two sides to leverage. If both bank reported ROA equal to negative 1 percent, then the Bank B's ROE would be negative 20 percent. In view of downside risk of leveraging, ROE model is not an appropriate tool to measure the performance of bank as it is influenced by amount of equity held by the bank. In addition, ROE model would indirectly penalize bank holding more equity capital but equity capital is essential in protecting bank from insolvency.

2.2.2 CAMELS Rating System

CAMELS rating is a composite rating tool used by Federal Financial Institutions Examination Council (FFIEC) to assess financial institution's financial conditions and operations. Component of CAMELS rating is commonly known as Capital adequacy, Asset quality, Management capability, Earnings strength, Liquidity, and Sensitivity to market risk rating. Capital adequacy, asset quality, liquidity, and sensitivity to market

risk measure risk related ratio within the bank while management capability and earnings strength measure the efficiency of bank's management. This rating is one of the common methods used to evaluate bank performance according to their basic functional areas. Regulators could assign a rating of 1 (best) to 5 (worst) in each of the six categories in CAMELS and then perform an overall composite rating.

- Rating of 1 or 2 indicates a fundamentally sound bank.
- Rating of 3 indicates that the bank shows some underlying weakness that should be corrected.
- Rating of 4 or 5 indicates a problematic bank.

Paragraph below explains analysis to be performed under each category of CAMELS.

Capital Adequacy (C)
Capital adequacy is a measurement of how well bank capitalize and solvency. Bank with higher capital adequacy under normal circumstances are well cushioned against unexpected loss. When conventional bank keeps more capital than required, regulator would rate them better on capital adequacy.

Asset Quality (A)
Asset quality is a measurement of risk of asset held by the bank. Bank with high impaired loan ratio, high risk concentration, low asset control and poor documentation will lead to more asset problem and poorer rating in asset quality which is unfavorable condition to the bank for long term.

Management Capability (M)
This category measures the capability of management in performing risk management practices relative to the institution's size, complexity, and risk profile. Bank with strong

management capability tends to thrive in performance not limited to short term but long term performance.

Earning Strength (E)

Earning strength reflects not only the quantity and trend of earnings, but also takes into account factors that may affect the sustainability of earnings. Banks need to have the capability to sustain their earnings in long term in order to survive.

Liquidity (L)

In this area, banks being assessed on their level of liquidity but also quality of liquid asset. Certain liquid asset has high sensitivity to market conditions and may not be able to liquidate on time in stressed market and is deemed as low quality liquid asset.

Sensitivity to Market Risk (S)

The sensitivity to market risk component reflects the degree to which changes in interest rates, foreign exchange rates, commodity prices, or equity prices can adversely affect a financial institution's earnings or economic capital.

CAMELS Rating System provides comprehensive measurement and able to evaluate the performance of conventional bank from various risk dimensions, but it is not the best tool for the purpose of this research. First of all, FFIEC did not disclose the scoring weightage for each of the factor in order to assign final CAMELS rating and how to assign rating of each factor. Second, factors in CAMELS require subjective interpretation from a group of subject matter expertise on each of the factor. For example, management capability requires analysis on each of the management committee in conventional bank through interview and background research. Asset quality analysis requires credit risk expert, liquidity analysis requires liquidity

management expert and sensitivity to market risk requires market risk expert. In addition to qualitative analysis required to assign the rating, the rating will take in consideration of institution's size and sophistication, the nature, risk profile and complexity of its activities. (Federal Deposit Insurance Corporation, 1997)

2.2.3 Profitability analysis using return on asset model

Several researches have been carried out in the past to study the financial performance of conventional banking in Malaysia using profitability ratio such as return on asset and return on equity. Besides, there are other researches that specifically study on efficiency ratio (i.e. profit efficiency) to determine profitability of conventional banking in Malaysia.

As early as year 2002, (Guru, Staunton, & Balashanmugam, 2002) examined the determinants of conventional banking profitability in Malaysia using data from 1985 to 1998. The results showed poor expense management is the main contributor to poor profitability component while high ratio of current account to total deposit would lead to high profitability in the asset based profitability model. For external determinant, both market interest rate and inflation found to have positive impact on bank's profitability.

(Suhaimi, Abdullah, & Saban, 2010) measured profit efficiency of conventional banks in Malaysia. Non ICT infrastructure, market share and foreign bank ownership affects profit efficiency positively. Besides, the authors also found that as bank size increased, profit efficiency decreased.

Another research was done by (Abdul Jamal, Abdul Karim, & Hamidi, 2012) on conventional bank's return on asset. Their results suggested that inflation, GDP, and stock market development are the main determinants of conventional bank's profitability.

Two recent studies on Malaysia bank's efficiency and profitability were carried out in year 2015. (Saha, Ahmad, & Dash, 2015) studied on technical efficiency drivers in Malaysian banking and the results showed that bank's size and return on assets are the significant driver of technical efficiency. (Lim, Shum, Soh, Wong, & Yong, 2015) identified capital adequacy, credit risk, bank size, GDP, and interest rate spread as the main determinants to Malaysian bank's profitability.

Research on conventional bank's performance is not uncommon for countries outside Malaysia. Naceur (2003), (Goddard, Molyneux, & Wilson, 2004), (Athanasoglou, Brissimis, & Delis, 2005), Alper and Anbar (2011), (Adeusi, Kolapo, & Aluko, 2014), (Kadira, January, & Gochero, 2015) have performed similar research on their respective country. Their research sometimes contradicts as nature of banking environment differs among countries. Despite the mixed result obtained from different researchers, the methodology adopted by various researchers and recommendation is worth to visit.

Determinants of Financial Performance

Table 2.1

Summary of existing literature on the determinants of financial performance:

Author(s)	Area of Research	Dependent Variable (DV)	Independent Variable (IV)	Sign of Coefficient of Significant IV
Guru, B. K., Staunton, J., Balashanmugam, B. (2002)	MALAYSIA	Net Income Before Tax / Total Asset	Expense Management	(+)
			Ratio of Current Account to Total Deposit	(+)
			Market Interest Rate	(+)
			Inflation	(+)
Suhaimi, R., Abdullah, F., Saban, G. (2010)	MALAYSIA	Profit Efficiency	Non ICT Infrastructure	(+)
			Market Share	(+)
			Foreign Bank Ownership	(+)
			Bank Size	(-)
Abdul Jamal, A. A., Abdul Karim, M. R. & Hamidi, M. (2012)	MALAYSIA	Return on Asset	Inflation	(+)
			Annual Real GDP growth rate	(+)
			Stock market development	(-)
			Average base lending rate	(+)
Ismail, R. (2012)	MALAYSIA	Return on Equity	Bank Size	(+)
			Liquidity	(+)
			Inflation	(+)
			Leverage	(+)
Alper, D., Anbar, A. (2011)	TUNISIA	Return on Asset	Bank Size	(+)
			Total Loan / Total Asset	(-)
			Total Loan under follow up / Total Loan	(-)
			Non-Interest Income	(+)
Mustafa, A. R., Ansari, R. H.,	PAKISTAN	Return on Asset	Total Loan Loss Provision / Total Asset	(-)

Younis, M. U. (2012)			Total Advances / Total Asset	(+)
			Total Deposit/ Total Asset	(-)
			Political Instability Index	(-)
Adeusi, S. O., Kolapo, F. T., Aluko, A. O. (2014)	NIGERIA	Return on Asset	Asset Quality	(-)
			Management Efficiency	(-)
			Gross Domestic Product	(-)
Kadira, G., January, C., Gochero, P. (2015)	ZIMBABWE	Return on Asset	Cash & Cash Equivalent / Total Asset	(-)
			Total Loan / Total Deposit	(-)
			Total Expenses / Total Asset	(-)
			Inflation	(+)
			Total Bank Asset / Gross Domestic Product	(-)
			Total Deposit / Total Liabilities	(-)
			Non-Interest Income / Gross Income	(+)
Lim, M. G., Shum, S. W., Soh, Y. Q., Wong, C. M., Yong, L. H. (2015)	MALAYSIA	Return on Asset	Total equity / Total asset	(+)
			Loan loss provision / Net loan	(-)
			Log of total assets	(-)
			GDP growth rate (annual %)	(+)
			Lending rate – deposit rate (spread in annual %)	(+)
Davies, N. O. (2013)	MALAYSIA	Return on Asset	Total Operating Expenses/Net Interest Income	(+)
			Operating Income/Total Assets	(+)
			Bank Size	(+)
Tafri, F. H., Hamid, Z., Meera, A. K. M., Omar, M. A. (2009)	MALAYSIA	Return on Asset	Previous Year's Return On Asset	(+)
			(Rate Sensitive Assets - Rate Sensitive Liabilities) / Total Capital	(+)
			Loan loss Provision/ Total Loan	(-)
			Total equity / Total asset	(-)

			Total derivative / Total asset	(+)
			Effect of Financial Crisis	(+)

CHAPTER THREE
METHODOLOGY

3.0 Introduction

This chapter sets out the methodology and design of the study. It also describes the data sources, research framework and a summary of the analysis that was carried out.

3.1 Data Sources

Secondary data was used in the study. The data for this study is collected from the websites such as DataStream (Reuters), Bank Negara Malaysia, World Bank Data, and various annual reports of conventional banks. For financials related variable, the data is extracted from DataStream (Reuters) and annual reports of conventional banks. In addition, non-financials related variables are extracted from Bank Negara Malaysia, World Bank Data, and Department of Statistic Malaysia. Final variables derivation is then performed in Microsoft Excel.

3.2 Study Sample

This study concentrates on 9 locally incorporated conventional banks. Malaysia has a population of conventional banks of 27 banks comprising 9 local banks and 19 foreign banks as at 12 November 2013. Annual Time series data for each of the conventional banks were extracted from the period 2002-2016 (15 years) for the purpose of analysis. In this study, unbalanced panel data were collected due to missing data for some of the variables.

3.3 Research Design

Majority of past research on the topic of determinants of financial performance of conventional banks in Malaysia are using traditional least square error regression method while the some are using technique of data envelopment analysis. However, least square regression analysis has notable limitations especially for time series data. According to Kulendran and Witt (2001), least square regression assumes the economic data are stationary i.e. constant mean, a constant finite variance, and a covariance which depends only upon the time between lagged observations. However, it is known that time series economic data are often non-stationary. As a result, statistical tests such as t-statistic, F-statistic, and R-squared from regression could be unreliable albeit having good model estimation result. This is also known as spurious regression. Nevertheless, determinants such as Risk Appetite Level and Volatility of Foreign Exchange Rate are yet to be tested in the previous research.

This study employs quantitative analysis. Consistent with the theory of Return on Equity Model, ideal proximate (proxy) to performance of conventional bank is return on asset (ROA) and thus ROA be the dependent variable. The independent variables (IV) are classified into internal determinants and external determinants. Internal determinants used in this study consist of two sub-groups. The first group is the measurement of efficiency level within the bank. Variable fall under measurement of efficiency level is non-interest expense to total asset ratio (NIETA). The second group of internal determinants measures the risk level within the bank. Two variables under group of risk level are asset quality ratio measured by impairment ratio (IR) and risk appetite measured by risk weighted asset to total earning asset (RA). External determinants used

in this study are economy variables measured by percentage increase in gross domestic product (GDP) and inflation. Looking at the summary of past research result, efficiency ratio such as expense management, risk related ratio such impairment ratio, and macroeconomic variable such as gross domestic product is frequently shown as significant independent variable. In addition, factors in CAMELS rating system is also categorized into two main groups which is efficiency ratio and risk ratio.

After final data collection and data derivation has been performed, a panel dataset with bank as cross section dimension (*N*) and financial year as time series dimension (*T*) would be formed. A panel dataset has multiple entities, each of which has repeated measurements at different time period. Since the data collected consists of cross section and time series, descriptive statistic by group of year and group of bank would be generated as a summary of data collected before the start of modelling. The primary objective to carry out descriptive statistics analysis is to understand whether data collected is accurate and reliable. The remaining section of research design critically discuss on different types of modelling technique for panel dataset.

Technique 1: Pooled Ordinary Least Square Model

Pooled Ordinal Least Square (POLS) is a pooled linear regression technique without fixed and/or random effects. It assumes a constant intercept and slopes regardless of group and time period. Javaid, Anwar, Zaman & Gafoor (2011) employed Pooled OLS technique to study the internal determinants of banks‟ profitability among the top 10 banks in Pakistan during the period 2004-2008. However, several assumptions of linear regression technique are required to be met before choosing this technique (Joseph, F. H., William, C. B., Barry, J. B., & Rolph, E. A., 2010):

1. Linear relationship between dependent variable and independent variable
2. Multivariate normality for all variables
3. No or little multicollinearity. Multicollinearity exists when independent variables are not independent from each other
4. No auto-correlation. Auto correlation exists when the residual / error term is not independent from each other
5. Homoscedasticity. Heteroscedasticity or unequal variance of the error term is the opposite of homescedasticity.

For the purpose of determining linear regression is it fit in this research, various statistical test need to be carried out in order to test for assumptions of linear regression technique. First of all, multicollinearity test will be carried out by using both correlation matrix, tolerance and variance inflation factor. The multicollinearity issue between independent variables will be in lesser concern when correlation coefficient less than 0.7 and variance inflation factor less than 10 (Gujarati, 2003). In addition, Durbin-Watson test will be carried out to test for auto-correlation issue.

Technique 2: Fixed or Random Effect Panel Data Model

If cross sectional or time specific effect exist, POLS does not produce efficient and consistent parameter estimates. In this case, the alternative is to use fixed or random effect model. According to Branas-Gaza, Bucheli & Garcia-Munoz (2011), static panel data model has the following functional form:

$$y_{it} = x'_{it}\beta + \alpha_i + v_{it}, i = 1, \dots, N(individuals), t = 1, \dots, T(time)$$

where x'_{it} is the *it*-th observation on *k* explanatory variable, β is the parameter vector, α_i represents the unobserved individual-specific time-invariant effects, and the residual

disturbance term v_{it} has zero mean, constant variance, and is uncorrelated across time and individuals.

Depending on the nature of α_i, two models can be further distinguished:

1. Random Effect Model: It assumes that α_i are random variables (uncorrelated with v_{it}). In this model, the regressors x_{it} are uncorrelated with individual effects α_i. Therefore, by using Generalized Least Square (GLS) could produce unbiasedly, consistent, and efficient estimate of parameters. Note that under hypothesis of no correlation between regressors and individual effects, OLS estimators are unbiased and consistent albeit not efficient.
2. Fixed Effect Model: It assumes that α_i are individual fixed parameters. In this model, it is not necessary to assume no correlation between regressors and individual effects. Usually, Within Group (WG) estimators, so-called "fixed effects estimators" are used to estimate the parameters. This fixed effect model is estimated by least squares dummy variable (LSDV) regression and within effect estimation methods.

Table 3.1

Summary of Static Panel Data Model

	Fixed Effect Model	Random Effect Model
Assumption	-	Individual effects are not correlated with regressors
Intercept	Varying across group and/or time	Constant
Error variances	Constant	Randomly distributed across group and/or time
Slopes	Constant	Constant
Estimation method	LSDV	GLS

Note that before choosing between Random Effect Model and Fixed Effect Model, the panel data has to be proved stationary and do not incorporate any temporal dependency (lags) of the dependent variable. In order to test for stationary of variables in panel dataset, panel unit root test need to be applied. There are seven commonly recognized methods for panel unit root test, the list of method as follows:

1. Breitung test (2000)
2. Levin, Lin and Chu test (2002)
3. Im, Pesaran and Shin (IPS) W-test (2003)
4. ADF-Fisher Chi-Square test (ADF-Fisher)
5. PP Fisher Chi-Square test (PP-Fisher)
6. Maddala and Wu test (1999)
7. Hadri test (2000)

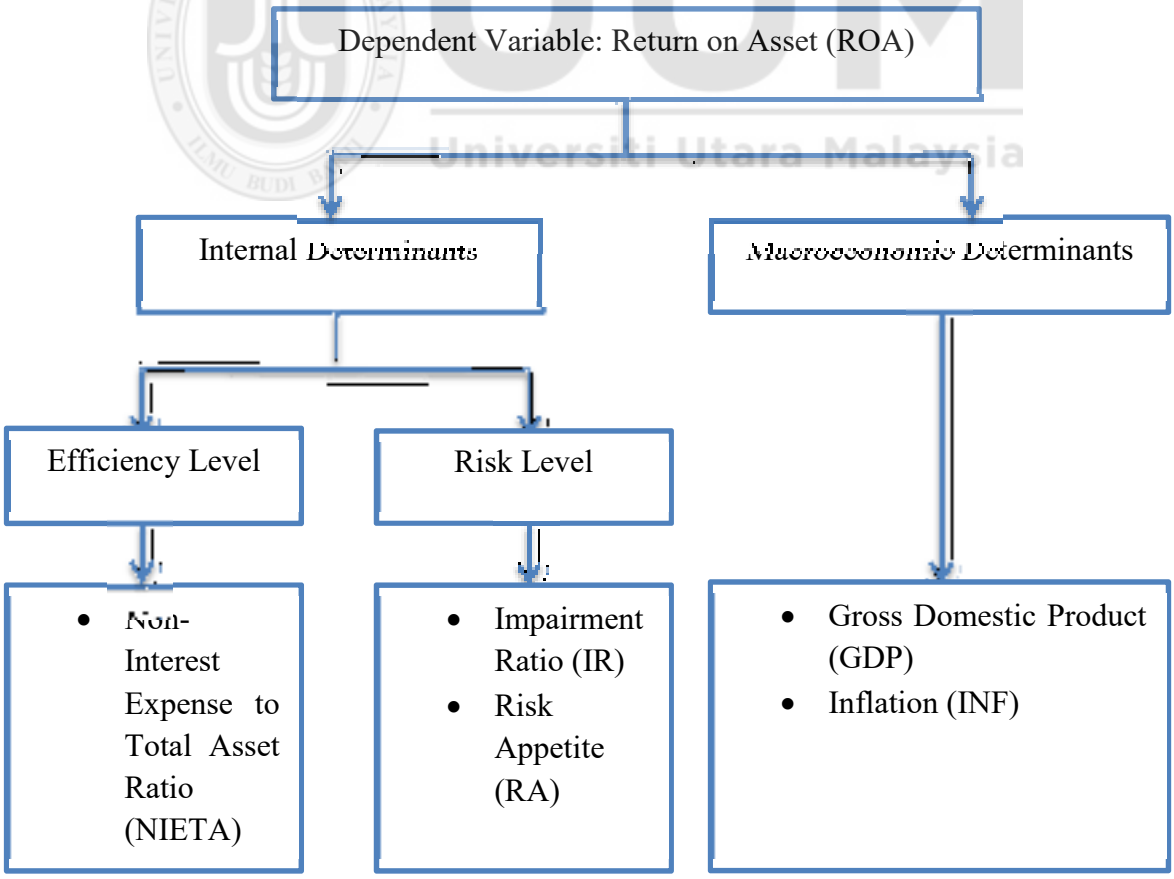
Technique 3: Panel Unit Root Test

Engle and Granger (1987) introduced the idea of "Spurious Regression" that if two independent integrated variables were used in a regression, with one of it chosen as "dependent variable" and the other as "explanatory variable", the standard regression model might able to obtain statistical significant relationship whereas in fact there was none. The cause of such misleading statistical significant relationship is mostly due to presence of unit root. Hence panel unit root test is required to be conducted to avoid spurious regression.

3.4 Research Framework

Figures 3.1

Research Framework



3.5 Variable Measurement and Definition

3.5.1 Financial Performance / ROA (Dependent Variable)

The literature indicates that there are many different measures for firm's performance, this study considers financial performance as the dependent variable and it is measured by using ROA. This dependent variable is in line with previous studies such as Naceur (2003), (Kadira, January, & Gochero, 2015), and (Lim et al., 2015).

$$Return\ on\ Asset = \frac{Net\ Income}{Total\ Asset}$$

3.5.2 Non-Interest Expense to Total Asset Ratio (Internal Independent Variable)

Non-Interest Expense to Income is used to measure efficiency in controlling expenses. It measured the ability of the bank to control expense while trying to maximize revenue through larger total asset. Conventional bank with lower non-interest expense to asset ratio is expected to have higher profit efficiency. Vong and Chan (2006) has tried this variable to determine bank profitability in Macao however the result of this variable is not significant.

$$Non - Interest\ Expense\ to\ Asset\ Ratio = \frac{Non\ Interest\ Expenses}{Total\ Asset}$$

3.5.3 Impairment Ratio (Internal Independent Variable)

Impairment ratio is the ratio of non-performing loan to total asset. Whenever a loan is deemed as unable to be repaid back by customer, bank would have to write off the loan asset. Bad loans write off is one of the primary costs of doing banking business therefore

it is important to keep impairment ratio as low as possible to enjoy high profitability. This independent variable is significant in research done by (Tafri, Hamid, Meera, & Omar, 2009), Ismail (2012), Davies (2013), and (Lim et al., 2015).

$$Impairment\ Ratio = \frac{Non\ Performing\ Loan}{Total\ Loans, Advances\ and\ Financing}$$

3.5.4 Risk Appetite (Internal Independent Variable)

Risk appetite is the measurement of willingness of the bank to take risk. The higher the amount of risk weighted asset (RWA) in relative to total asset, the higher the risk of the assets in the bank's portfolio. The risk return trade-off theory suggested that high risk associate with probability of higher return but also probability of higher losses. It is estimated that higher risk appetite leads lower return as conventional banks are highly competitive in lower risk business segments such as mortgage portfolio. Therefore, less competitive banks have no choice but to take in higher risk assets such as unsecured lending which easily leads to negative return due to higher non-performing loan.

$$Risk\ Appetite = \frac{Risk\ Weighted\ Asset}{Earning\ Asset}$$

3.5.5 Macroeconomic Variables

3.5.5.1 Gross Domestic Product

GDP measures economy activity of a country. High growth in GDP amount would leads to better economy outlook and increase in investor's confidence. As the amount of investment in the country increased, generally it would lead to higher needs of financing

for development and investment. Therefore, it is expected that GDP have positive relationship with bank's performance and in line with the results from Abdul Jamal et al. (2012) and Lim et al. (2015).

3.5.5.2 Inflation

Inflation refers to rate of change of prices of goods. When the price of goods increases rapidly, it usually due to economy is expanding thus and people needs more financing resource to keep up with the pace of economy development. Therefore, it is expected that INF have positive relationship with bank's performance which in line with the most of the past research results from Malaysia and some of the past research results from overseas. For instance, past research results from Abdul Jamal et al. (2012), Guru, B. K., Staunton, J., Balashanmugam, B. (2002), Ismail, R. (2012), and also Kadira, G., January, C., Gochero, P. (2015).

3.6 Specification of the Model

The following regression model is used to test the relationship between internal determinants and external determinants against bank's financial performance:

$$\boldsymbol{ROA_{it} = \beta_0 + \beta_1 NIETA_{it} + \beta_2 IR_{it} + \beta_3 RA_{it} + \beta_4 GDP_{it} + \beta_5 INF_{it}}$$

Where

$\boldsymbol{\beta_0}$ is the constant variable and

NIETA = Non-Interest Expense to Total Asset Ratio

IR = Impairment Ratio (Non-performing loan / Total loans, advances and financing)

RA = Risk Appetite (Risk Weighted Asset / Earning Asset)

GDP = Annual percentage increase of gross domestic product

INF = Inflation Rate

3.7 Development Hypothesis

H1: There is a relationship between financial performances of conventional bank and non-interest expense to asset ratio

H2: There is a relationship between financial performances of conventional bank and impairment ratio

H3: There is a relationship between financial performances of conventional bank and risk appetite

H4: There is a relationship between financial performances of conventional bank and gross domestic product

H5: There is a relationship between financial performances of conventional bank and inflation rate

CHAPTER FOUR
EMPIRICAL RESULTS AND DISCUSSION

4.0 Empirical Results and Discussion

This chapter discusses the empirical results of the study as suggested by the research design in section 3.3.

4.1 Descriptive Statistics

The primary purpose to carry out descriptive statistics analysis is to examine the accuracy and reliability of data collected. For this research, the seven types of descriptive statistics analysis carried out are:

1. Mean value
2. Standard Deviation (Std Dev)
3. Minimum value
4. Maximum value
5. Number of non-missing value (N)
6. Number of missing value (N miss)
7. Median value

Table 4.1

Descriptive Statistic of variables used in this study

Variable	Mean	Std Dev	Minimum	Maximum	N	N Miss	Median
ROA	0.99%	0.36%	-0.85%	1.64%	118	0	1.00%
NIETA	2.366	3.174	-24.828	13.145	117	1	2.079
IR	6.35%	6.59%	0.50%	36.19%	115	3	3.72%
RA	77.77%	21.21%	5.01%	135.29%	90	28	76.20%
GDP	5.177	2.547	-2.526	9.428	110	8	5.474
INF	3.598	4.171	-5.016	12.004	110	8	3.214

Referring to the descriptive statistic results above, data accuracy and data reliability issue is not of major concern as very few missing values were found in the data. The dependent variable (ROA) has data populated for all banks and also throughout the whole sample period of 2002-2016. Both mean and median ROA are close to 1 percent which indicates average conventional banks in Malaysia were able to generate close to RM1 profit per year for each of RM100 assets held by the bank. The primary assets held by the all conventional bank's balance sheet are lending asset such as mortgage, commercial loan, and credit card. The minimum value for ROA is -0.85% which proved that not all conventional banks are profitable in each and every year.

4.2 Multicollinearity Test

In order to apply POLS model, all independent variables require test for multicollinearity. There are several methods to detect multicollinearity issue, the most common method includes correlation matrix, variance inflation factor (VIF), and tolerance.

Table 4.2
Correlation matrix for all independent variable

	GDP	IR	INF	NIETA	RA
GDP	1				
IR	0.15	1			
INF	0.41	0.28	1		
NIETA	-0.27	0.18	0.02	1	
RA	0.08	0.11	0.06	0.03	1

Correlation matrix above showed that no serious multicollinearity issue found in the data. Most of the independent variables showed low value of correlation coefficient except GDP and INF with correlation value of 0.41.

Table 4.3
Tolerance and Variance Inflation Index (VIF)

Variable	Tolerance	VIF
NIETA	.869	1.150
IR	.874	1.144
RA	.982	1.018
GDP	.742	1.347
INF	.772	1.295

Threshold value that suggest present of multicollinearity issue by using measurement of tolerance and variance inflation factor (VIF) are Tolerance < 0.01 and VIF > 10. As a summary, there is no clear evidence of multicollinearity issue present in the data after performing various multicollinearity tests.

4.3 Autocorrelation Test

Autocorrelation test for residuals are not independent from each other. The problem of autocorrelation normally occurs in time series data. Null hypothesis of Durbin-Watson stat test indicates that the residuals are not linearly auto-correlated. As a rule of thumb,

value of 2 to 4 indicates no autocorrelation issue present based on Durbin-Watson stat test. The POLS result (see Appendix 1) after applying POLS regression shows that Durbin-Watson statistic of 0.99 which indicates the issue of autocorrelation in panel data. As a result, technique 1 is not the best technique for this research and should be disregarded.

4.4 Panel unit root Test

Panel unit root test provide information about the order of integration of which is crucial in empirical analysis since applying the ordinary least square estimator in non-stationary variables results in spurious regressions. Panel unit root test result presented in Appendix 2 while the summary of panel unit root test is shown below at Table 4.4.

Table 4.4
Summary of Panel Unit Root Test

Variable	Stationary at	Description	Unit Root
Return on Asset (DV)	I(0)	Stationary at level	No
Gross Domestic Product Growth	I(0)	Stationary at level	No
Impairment Ratio	I(0)	Stationary at level	No
Inflation	I(0)	Stationary at level	No
Non Interest Expense to Income	I(0)	Stationary at level	No
Risk Appetite	I(0)	Stationary at level	No

Panel unit root test results from Table 4.4 showed that all of the variables are stationary and does not contain unit root at level.

4.5 Hausman Test

Hausman test in this research is used to determine whether fixed effect model or random effect model has to be applied. Referring to Appendix 3, Hausman test showed probability value (p-value) of 0.0007 which is lesser than 0.05. Therefore, null hypothesis is rejected and therefore fixed effect model is proved as the better model for this research.

4.6 Panel Data Modelling Results

Table 4.5
Summary of modelling technique selection

Model	Model Selection Test	Remarks	Selected Modelling Technique
Pooled OLS Model	Autocorrelation Test	Autocorrelation Issue	No
Fixed Effect Model	Hausman Test	Fixed Effect has higher efficiency	**Yes**
Random Effect Model	Hausman Test	Fixed Effect has higher efficiency	No

The summary table on above showed that the best type of model used for this research is fixed effect regression model. Pooled OLS and Random Effect modelling technique were not selected after conducting several statistical hypothesis tests such as autocorrelation test, Hausman test, and panel unit root test.

Table 4.6

Results of panel data regression modelling

Variable	Pooled OLS		Fixed Effect Model		Random Effect Model	
	Coefficient	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
Intercept	0.01287	0.0000	0.01344	0.0000	0.01287	0.0000
Gross Domestic Product	0.00014	0.4387	0.00024	0.1528	0.00014	0.3964
Impairment Ratio	-0.03432	0.0000	**-0.02448**	**0.0004***	-0.03432	0.0000
Inflation	0.00011	0.2763	0.00005	0.6094	0.00011	0.2334
Non-Interest Expense to Total Asset Ratio	0.00026	0.0165	**0.00028**	**0.0076***	0.00026	0.0088
Risk Appetite	-0.00313	0.0662	**-0.00507**	**0.0067***	-0.00313	0.0446
R^2	0.323217		**0.488147**		0.323217	
Adjusted R^2	0.278692		**0.399129**		0.278692	

*Significant at 1% confidence level

Table 4.6 shows the regression results for Pooled OLS, Fixed Effect, and Random Effect Model. However, only the regression result for Fixed Effect Model will be discuss in further details as it is the selected modelling technique. The R^2 and adjusted R^2 for Fixed Effect Model are 48.81% and 39.91% respectively. It means that close to 50% of the variations of profitability of local conventional bank in Malaysia are able to be explained by the model. The R^2 is not high but the underlying reason could be due to number of independent variable (IV) is not enough to explain variability of return of asset. This result is not surprising as the banking environment is so complex that handful of independent variable is not enough to explain variability of profitability. The average number of significant IV from existing research is 5 while number of the significant IV obtain from this result is only 3. In addition, the adjusted R^2 from (Tafri, Hamid, Meera, & Omar, 2009) is also close to 50%. (Tafri, Hamid, Meera, & Omar, 2009) researched

impact of financial performance from financial risk where financial performance is return on asset. Their adjusted R^2 for no effect model, fixed effect model, and random effect model are 50.7%, 56.1%, and 50.7% respectively.

Fixed model result from Table 9 indicate that only impairment ratio (IR), non-interest expense to total asset ratio (NIETA), and risk appetite (RA) are statistically significant at 1% confidence level. The remaining variables are not significant even at 10% confidence interval therefore concluded as not able to affect significantly to the financial performance of conventional bank. Two out of the three significant variables are measuring the risk level within the bank (Internal Determinants) while the other variable is measuring the efficiency of controlling expenses within the bank. It can be concluded that controlling the risk level is the primary factors in running conventional bank and followed by cost efficiency control. None of the external determinants impact significantly to the financial performance of the conventional bank. This proves that the effects of external factor such as economy are not material enough to vary the earnings of conventional bank. Such result was supported by the fact that year 2009 where GDP growth is -1.51% and yet the minimum value of ROA during the year for all conventional banks is 0.24%. Ismail (2012) also tried macroeconomic variable such as inflation, gross domestic product and base lending rate to study Malaysian's bank profitability but only two non-macroeconomic variable showing significant relationship which are total asset and liquidity asset / total asset.

Among the three significant variables in the model, IR has the highest coefficient which is -0.025, the negative sign for the coefficient indicates negative relationship between ROA and IR. The higher the IR, the lower the ROA. Assuming other independent

variables are fixed, each 1% increase of IR would decrease 0.025% of ROA. It is not unexpected that IR showing significant relationship with financial performance of the Malaysia bank as cost of impaired loans is the major cost to the bank's operation. This result is consistent with previous research as IR showed significant relationship in most of the past research such as Hamid, Z., Meera, A. K. M., Omar, M. A. (2009).

At 1% confidence interval, the coefficient of RA is -0.005, the negative sign for the coefficient indicates negative relationship between RA and IR. The higher the value of RA, the lower the ROA would be. With the assumption of other independent variables are fixed, each 1% increase of RA would decrease 0.005% of ROA. RA is a new variable tested specifically in this research and it is interesting to note that RA is showing significant relationship with ROA.

The lowest coefficient among the significant variable obtained from the regression model is 0.0003 for NIETA. The positive sign indicates positive relationship between NIETA and IR. This also translates to the higher the value of NIETA, the higher the ROA. By assuming the effect from other independent variables is fixed, each 1% increase of NIETA would contribute to increase of 0.0003 % of ROA. This result is rather unexpected as Vong and Chan (2006) has tried this variable to determine factors affecting bank's profitability in Macao but the result of this variable is not significant in their research.

CHAPTER FIVE
CONCLUSION AND RECOMMENDATION

5.0 Recommendations and Conclusion

This chapter provides several recommendations from the result from chapter four as well as the overall conclusion.

5.1 Conclusion

This research proved that impairment ratio (IR), risk appetite (RA), and non-interest expense to income ratio significantly affects the performance or the return of asset (ROA) of conventional bank. In addition, comparing both internal and macroeconomic determinants of conventional bank, internal determinant has much stronger and significant impact as none of the external determinant showing significant relationship with the performance of conventional bank.

From all the factors tested in this research, impairment ratio has the most significant impact to ROA of conventional bank. Therefore, bankers should be extra cautious in loan underwriting as high amount of bad loan would significantly have decreased ROA of bank. On the other hand, regulator should watch out bank that is experiencing sudden increase of impairment ratio as it is an early warning sign of deterioration of bank's performance.

An interesting factor found in this research is that high risk appetite would decrease ROA of bank. This finding is against the risk return theory which stated "high risk high return". It also implies that banks that do not control the risk level within their bank would lead to lesser profitability due to higher cost associated with risky asset.

Therefore, it is recommended that banks should keep less risky asset and perform sound risk management practice within their portfolio in order to generate maximum ROA.

Another interesting finding from this research is that the higher the non-interest expense, the higher will be the ROA. This finding could be interpreted as banks that are willing to spend more on non-interest expense (i.e. Overhead, operation expense) to enhance customer's experience would be able to generate higher profit per asset. The idea of customer experience would improve financial performance is supported by Chi and Gursoy, 2009. This also can be interpreted as investment arm of conventional bank that typically has only non-interest expenses would generate the most profit among all revenue earning segments. In addition, we could also deduce that giving higher salary to experienced and skilled staff which would increase staff's retention rate would also generate more profit to the bank. This could be due to highly skilled staff able to increase operation efficiency therefore generates the most return to the bank. Therefore, conventional bank should invest more on human resources in order to obtain skilled and experience staff to maximize profit.

The above findings should provide useful information to bank's management on how to improve return on asset of the bank. Furthermore, regulator could make reference to innovative variable used in this research where risk appetite is one of the significant factor in influencing bank's future financial performance and also to develop early warning system to detect problematic conventional bank. This early warning system is important tool to strengthen the stability of Malaysia financial system which in line with the objective of BNM's financial sector blue print master plan.

5.2 Recommendations for future research

Risk Appetite being one of the main determinants of performance of bank is rather a new finding in this area of research. Future research incorporating this variable for other sample countries would lead to more conclusive results. In addition, due to limited independent variable for this research, the R^2 from model output is rather low, which is only 49%. In order to increase R^2, future research should consider additional new independent variable such as staff retention rate, liquidity coverage ratio, and number of branch.

6.0 References

Adeusi, S. O., Kolapo, F. T., & Aluko, A. O. (2014) Determinants of Commercial Banks' Profitability Panel Evidence from Nigeria. International Journal of Economics, Commerce and Management. Retrieved from http://ijecm.co.uk/wp-content/uploads/2014/12/21228.pdf

Alper, D., & Anbar, A. (2011) Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey. Business and Economics Research Journal, 2. Retrieved from https://pdfs.semanticscholar.org/1f0b/740c856f11f045b20d6d0cd977a721a035f4.pdf

Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2005) Bank-Specific, Industry Specific and Macroeconomic Determinants of Bank Profitability. Retrieved from https://www.bankofgreece.gr/BogEkdoseis/Paper200525.pdf

Bank Negara Malaysia. (2016) *Monthly Statistical Bulletin.* Retrieved from: http://www.bnm.gov.my/files/publication/msb/2016/8/xls/1.7.xls

Bank Negara Malaysia. (2018) *List of Licensed Financial Institutions.* Retrieved from: http://www.bnm.gov.my/index.php?ch=li&cat=banking&type=CB&fund=0&cu=0

Bessis, J. (2010) Risk Management in Banking. Chichester, United Kingdom: John Wiley

Brañas-Garza, Pablo, Bucheli, Marisa & García-Muñoz, Teresa M., (2011), Dynamic panel data: A useful technique in experiments. *ThE Papers, Department of*

Economic Theory and Economic History of the University of Granada., Retrieved from https://EconPapers.repec.org/RePEc:gra:wpaper:10/22.

Brimble, M., Kidwell, D. S., Basu, A., Blackwell, D. W., Lenten, L., Whidbee, D. A., Thomson, D., & Peterson, R. L. (2011) *Financial Markets, institutions and money*. Milton, Australia: John Wiley & Sons Australia, Ltd.

Cannata, F. & Quagliariello, M. (2011) *Basel III and Beyond: A Guide to Banking Regulation After the Crisis.* London, England: Risk Books

Chi, C. G. & Gursoy, D. (2009) Employee Satisfaction, customer satisfaction, and financial performance: An empirical examination. *International Journal of Hospitality Management. 28. 245-253.* Retrieved from https://static1.squarespace.com/static/518e58afe4b0a66536acf664/t/538c9d98e4b06b14cf93914a/1401724312665/2009+satisfaction+%26+performance+-+IJHM-2.pdf

Davies, N. O. (2013) Evaluation of the financial performances of domestic commercial banks: An Empirical Study in Malaysia. Retrieved from http://etd.uum.edu.my/5226/2/s808881_abstract.pdf

Engle, R. F. & Granger, C. W. J. (1987) Co-Integration and Error Correction: Representation, Estimation, and Testing. *Econometrica, Volume 55, Issue 2.* Retrieved from http://www.ntuzov.com/Nik_Site/Niks_files/Research/papers/stat_arb/EG_1987.pdf

Federal Deposit Insurance Corporation. (1997) *Uniform Financial Institutions Rating System.* Retrieved from https://www.fdic.gov/regulations/laws/federal/ufir.pdf

Goddard, J., Molyneux, P., & Wilson, J. O. S. (2004) The profitability of European banks: A cross-sectional and dynamic panel analysis. *The Manchester School Vol 72 No. 3.* Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.378.4433&rep=rep1&type=pdf

Gujarati, D.N. (2003) Basic Econometrics. New York: McGraw Hill Book Co.

Guru, K. B., Staunton, J., & Shanmugam, B. (2000) *Determinants of commercial bank profitability in Malaysia.* Retrieved from http://web.usm.my/aamj/5.2.2000/5-2-1.pdf

Hull, J. C. (2010) *Risk Management and Financial Institutions*. Boston, United States of America: Pearson Education, Inc

Ismail, R. (2012) Non finance versus finance factor's influence on bank's profitability: Evidence from Malaysia Retrieved from http://etd.uum.edu.my/3158/3/ROSMARINIWATI_ISMAIL.pdf

Jamal, A. A. A., Karim, M. R. A., & Hamidi, M. (2012). Determinants of Commercial Banks' Return on Asset: Panel Evidence from Malaysia. International Journal of Commerce and Management. Vol.1 No.3. 10. Retrieved from https://www.researchgate.net/publication/235962256_Determinants_of_Commercial_Banks'_Return_on_Asset_Panel_Evidence_from_Malaysia

Javaid, S., Anwar, J., Zaman, K., & Gafoor, A. (2011) Determinants of Bank Profitability in Pakistan: Internal Factor Analysis. *Mediterranean Journal of Social*

Sciences, 2 Retrieved from https://www.academia.edu/8706158/Determinants_of_Bank_Profitability_in_Pakistan_internal_factor_Analysis?auto=download

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010) *Multivariate Data Analysis.* Upper Saddle River, New Jersey: Pearson Education, Inc.

Kadira, G., January, C., & Gochero, P. (2015) Determinants and Effect of Commercial Bank Profitability in Zimbabwe (2009-2013). *European Journal of Business and Management.* Retrieved from http://www.iiste.org/Journals/index.php/EJBM/article/viewFile/26336/26959

Koch, T. W. & MacDonald, S. S. (2010) *Bank Management 7th Edition.* Mason, OH: South-Western, Cengage Learning

Kulendran, N., & Witt, S. F. (2001). "Cointegration versus Least Squares Regression." *Annals of Tourism Research, 28 (2), 291-311.*

Lim, M. G., Shum, S. H., Soh, Y. Q., Wong, C. M., & Yong, L. H. (2015) Bank-specific and Macroeconomic Determinants of Bank's Profitability: A study of Commercial Bank in Malaysia. Retrieved from http://eprints.utar.edu.my/1510/1/Bank-specific_and_Macroeconomic_Determinants_of_Bank's_Profitability,_A_Study_of_Commercial_Banks_in_Malaysia.pdf

Mustafa, A. R., Ansari, R. H., & Younis, M. U. (2012) Does the loan loss provision affect the banking profitability in case of Pakistan? *Asian Economic and Financial Review, 2(7)* Retrieved from http://www.aessweb.com/pdf-files/772-783.pdf

Naceur, S. B. (2003) The determinants of the Tunisian Banking Industry Profitability: Panel Evidence. Retrieved from http://www.mafhoum.com/press6/174E11.pdf

Saha, A., Ahmad, N. H., & Dash, U. (2015) Drivers of technical efficiency in Malaysian banking: a new empirical insight *Asian-Pacific Economic Literature* doi: 10.1111/apel.12091

Suhaimi, R., Abdullah, F., & Saban, G. (2010) Factors affecting profit efficiency of commercial banks in Malaysia. Retrieved from http://waset.org/publications/1436/profit-efficiency-and-competitiveness-of-commercial-banks-in-malaysia

Tafri, F. H., Hamid, Z., Meera, A. K. M., Omar, M. A. (2009) The Impact of Financial Risks on Profitability of Malaysian Commercial Banks: 1996-2005. *International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering Vol:3, No:6.* Retrieved from https://waset.org/publications/5446/the-impact-of-financial-risks-on-profitability-of-malaysian-commercial-banks-1996-2005

World Bank Data. (2016) *DataBank.* Retrieved from: http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=MY

Vong, Anna & Si Chan, Hoi. (2006). Determinants of Bank Profitability in Macao. Retrieved from https://www.researchgate.net/publication/252081427_Determinants_of_Bank_Profitability_in_Macao

7.0 Appendix

7.1 Appendix 1

Appendix 1: Pooled OLS Model

Regression results of Pooled OLS Model:

Dependent Variable: RETURN_ON_ASSET
Method: Panel Least Squares
Date: 11/05/17 Time: 19:07
Sample (adjusted): 2002 2015
Periods included: 14
Cross-sections included: 8
Total panel (unbalanced) observations: 82

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012872	0.001560	8.250466	0.0000
GROSS_DOMESTIC_PRODUCT_G	0.000137	0.000177	0.778498	0.4387
IMPAIRMENT_RATIO	-0.034317	0.006352	-5.402485	0.0000
INFLATION	0.000112	0.000102	1.096458	0.2763
NON_INTEREST_EXPENSE_TO_	0.000262	0.000107	2.452636	0.0165
RISK_APPETITE	-0.003129	0.001679	-1.863995	0.0662

R-squared	0.323217	Mean dependent var	0.010047
Adjusted R-squared	0.278692	S.D. dependent var	0.003783
S.E. of regression	0.003213	Akaike info criterion	-8.572754
Sum squared resid	0.000785	Schwarz criterion	-8.396652
Log likelihood	357.4829	Hannan-Quinn criter.	-8.502052
F-statistic	7.259189	Durbin-Watson stat	0.990455
Prob(F-statistic)	0.000013		

Results of Autocorrelation Test using Durbin-Watson stat after running pooled OLS Model: 0.99

7.2 Appendix 2

Appendix 2: Panel Unit Root Test

Results of Unit Root Test at Level for Return on Asset (Dependent Variable):

Panel unit root test: Summary
Series: RETURN_ON_ASSET
Date: 06/18/17 Time: 21:06
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-4.39664	0.0000	8	110
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.61357	0.0045	8	110
ADF - Fisher Chi-square	30.2199	0.0169	8	110
PP - Fisher Chi-square	29.0706	0.0235	8	110

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

Results of Unit Root Test at First Difference for Return on Asset (Dependent Variable):

Panel unit root test: Summary
Series: D(RETURN_ON_ASSET)
Date: 06/18/17 Time: 21:06
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-11.7643	0.0000	8	101
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.48998	0.0000	8	101
ADF - Fisher Chi-square	85.1341	0.0000	8	101
PP - Fisher Chi-square	109.993	0.0000	8	102

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

Results of Unit Root Test at Level for Gross Domestic Product Growth:

Panel unit root test: Summary
Series: GROSS_DOMESTIC_PRODUCT_G
Date: 06/18/17 Time: 16:27
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.74441	0.0000	8	102
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.54940	0.0000	8	102
ADF - Fisher Chi-square	57.0209	0.0000	8	102
PP - Fisher Chi-square	87.5038	0.0000	8	102

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

Results of Unit Root Test at First Difference for Gross Domestic Product Growth:

Panel unit root test: Summary
Series: D(GROSS_DOMESTIC_PRODUCT_G)
Date: 06/18/17 Time: 16:23
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-11.6437	0.0000	8	86
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.58676	0.0000	8	86
ADF - Fisher Chi-square	80.0663	0.0000	8	86
PP - Fisher Chi-square	166.729	0.0000	8	94

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

Results of Unit Root Test at Level for Impairment Ratio:

Panel unit root test: Summary
Series: IMPAIRMENT_RATIO
Date: 06/18/17 Time: 17:02
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.55700	0.0000	8	104
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.89656	0.0000	8	104
ADF - Fisher Chi-square	51.8952	0.0000	8	104
PP - Fisher Chi-square	80.4029	0.0000	8	107

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

Results of Unit Root Test at First Difference for Impairment Ratio:

Panel unit root test: Summary
Series: D(IMPAIRMENT_RATIO)
Date: 06/18/17 Time: 17:03
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-11.4988	0.0000	8	95
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-6.70244	0.0000	8	95
ADF - Fisher Chi-square	60.4316	0.0000	8	95
PP - Fisher Chi-square	76.8045	0.0000	8	99

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

Results of Unit Root Test at Level for Inflation:

Panel unit root test: Summary
Series: INFLATION
Date: 06/18/17 Time: 17:58
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-13.4585	0.0000	8	102
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-9.52551	0.0000	8	102
ADF - Fisher Chi-square	94.4495	0.0000	8	102
PP - Fisher Chi-square	93.9805	0.0000	8	102

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

Results of Unit Root Test at First Difference for Inflation:

Panel unit root test: Summary
Series: D(INFLATION)
Date: 06/18/17 Time: 17:58
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-15.4585	0.0000	8	86
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-11.2539	0.0000	8	86
ADF - Fisher Chi-square	111.536	0.0000	8	86
PP - Fisher Chi-square	196.563	0.0000	8	94

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

Results of Unit Root Test at Level for Non-Interest Expense to Income Ratio:

Panel unit root test: Summary
Series: NON_INTEREST_EXPENSE_TO_
Date: 06/18/17 Time: 18:01
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.03987	0.0000	8	106
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.57437	0.0000	8	106
ADF - Fisher Chi-square	51.5897	0.0000	8	106
PP - Fisher Chi-square	67.2617	0.0000	8	108

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

Results of Unit Root Test at First Difference for Non-Interest Expense to Income Ratio:

Panel unit root test: Summary
Series: D(NON_INTEREST_EXPENSE_TO_)
Date: 06/18/17 Time: 18:01
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-10.1001	0.0000	8	98
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.57552	0.0000	8	98
ADF - Fisher Chi-square	90.0194	0.0000	8	98
PP - Fisher Chi-square	125.743	0.0000	8	99

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

Results of Unit Root Test at Level for Risk Appetite:

Panel unit root test: Summary
Series: RISK_APPETITE
Date: 06/18/17 Time: 18:01
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.19404	0.0000	8	78
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.24540	0.0006	8	78
ADF - Fisher Chi-square	29.0522	0.0236	8	78
PP - Fisher Chi-square	31.3734	0.0121	8	78

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

Results of Unit Root Test at First Difference for Risk Appetite:

Panel unit root test: Summary
Series: D(RISK_APPETITE)
Date: 06/18/17 Time: 18:02
Sample: 2002 2016
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.17446	0.0000	7	62
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.67999	0.0000	6	59
ADF - Fisher Chi-square	53.7184	0.0000	7	62
PP - Fisher Chi-square	59.8499	0.0000	7	64

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

7.3 Appendix 3

Appendix 3: Hausman Test

Regression results of Hausman Test:

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

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	21.481626	5	0.0007

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
GROSS_DOMESTIC_PRODUCT_G	0.000237	0.000137	0.000000	0.0012
IMPAIRMENT_RATIO	-0.024479	-0.034317	0.000009	0.0012
INFLATION	0.000049	0.000112	0.000000	0.0021
NON_INTEREST_EXPENSE_TO_	0.000278	0.000262	0.000000	0.5470
RISK_APPETITE	-0.005066	-0.003129	0.000001	0.0459

Cross-section random effects test equation:
Dependent Variable: RETURN_ON_ASSET
Method: Panel Least Squares
Date: 11/05/17 Time: 21:47
Sample (adjusted): 2002 2015
Periods included: 14
Cross-sections included: 8
Total panel (unbalanced) observations: 82

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013439	0.001618	8.307353	0.0000
GROSS_DOMESTIC_PRODUCT_G	0.000237	0.000164	1.445644	0.1528
IMPAIRMENT_RATIO	-0.024479	0.006549	-3.737609	0.0004
INFLATION	4.90E-05	9.54E-05	0.513309	0.6094
NON_INTEREST_EXPENSE_TO_	0.000278	0.000101	2.750968	0.0076
RISK_APPETITE	-0.005066	0.001813	-2.793586	0.0067

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.488147	Mean dependent var	0.010047
Adjusted R-squared	0.399129	S.D. dependent var	0.003783
S.E. of regression	0.002933	Akaike info criterion	-8.681336
Sum squared resid	0.000593	Schwarz criterion	-8.299783
Log likelihood	368.9348	Hannan-Quinn criter.	-8.528148
F-statistic	5.483701	Durbin-Watson stat	1.347689
Prob(F-statistic)	0.000002		

7.4 Appendix 4

Appendix 4: Fixed Effect Model

Regression results of Fixed Effect Model:

Dependent Variable: RETURN_ON_ASSET
Method: Panel Least Squares
Date: 11/12/17 Time: 17:02
Sample (adjusted): 2002 2015
Periods included: 14
Cross-sections included: 8
Total panel (unbalanced) observations: 82

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013439	0.001618	8.307353	0.0000
GROSS_DOMESTIC_PRODUCT_G	0.000237	0.000164	1.445644	0.1528
IMPAIRMENT_RATIO	-0.024479	0.006549	-3.737609	0.0004
INFLATION	4.90E-05	9.54E-05	0.513309	0.6094
NON_INTEREST_EXPENSE_TO_	0.000278	0.000101	2.750968	0.0076
RISK_APPETITE	-0.005066	0.001813	-2.793586	0.0067

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.488147	Mean dependent var	0.010047
Adjusted R-squared	0.399129	S.D. dependent var	0.003783
S.E. of regression	0.002933	Akaike info criterion	-8.681336
Sum squared resid	0.000593	Schwarz criterion	-8.299783
Log likelihood	368.9348	Hannan-Quinn criter.	-8.528148
F-statistic	5.483701	Durbin-Watson stat	1.347689
Prob(F-statistic)	0.000002		

7.5 Appendix 5

Appendix 5: Random Effect Model

Regression results of Random Effect Model:

Dependent Variable: RETURN_ON_ASSET
Method: Panel EGLS (Cross-section random effects)
Date: 11/05/17 Time: 21:46
Sample (adjusted): 2002 2015
Periods included: 14
Cross-sections included: 8
Total panel (unbalanced) observations: 82
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012872	0.001424	9.039585	0.0000
GROSS_DOMESTIC_PRODUCT_G	0.000137	0.000161	0.852957	0.3964
IMPAIRMENT_RATIO	-0.034317	0.005798	-5.919208	0.0000
INFLATION	0.000112	9.32E-05	1.201329	0.2334
NON_INTEREST_EXPENSE_TO_	0.000262	9.74E-05	2.687219	0.0088
RISK_APPETITE	-0.003129	0.001532	-2.042277	0.0446

Effects Specification	S.D.	Rho
Cross-section random	0.000000	0.0000
Idiosyncratic random	0.002933	1.0000

Weighted Statistics			
R-squared	0.323217	Mean dependent var	0.010047
Adjusted R-squared	0.278692	S.D. dependent var	0.003783
S.E. of regression	0.003213	Sum squared resid	0.000785
F-statistic	7.259189	Durbin-Watson stat	0.990455
Prob(F-statistic)	0.000013		

Unweighted Statistics			
R-squared	0.323217	Mean dependent var	0.010047
Sum squared resid	0.000785	Durbin-Watson stat	0.990455