

DETERMINANTS AND PERFORMANCE OF
ISLAMIC DEVELOPMENT FINANCIAL
INSTITUTIONS (DFIs): EVIDENCE FROM
MALAYSIA

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DECLARATION

We hereby declare that:

- (1) This undergraduate research project is the end of our own work and that due acknowledgement has been given in the references to ALL resources 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 words count of this research project is 20,165 words.

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DEDICATIONS

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey Fuller
AFS	Available-for-sales
BMI	Bank Muamalat Indonesia
BNM	Bank Negara Malaysia
BPMP	Bank Pembangunan Malaysia Berhad
Bank Rakyat	Bank Kerjasama Rakyat Malaysia Berhad
BSN	Bank Simpanan Nasional
CAR	Capital Adequacy Ratio
CDM	Cash Deposit Machines
CGC	Credit Guarantee Corporation Berhad
CLRM	Classical Linear Regression Model
CPI	Consumer Price Index
DFIA	Development Financial Institutions Act 2002
DEPO	Liability
DFIs	Development Financial Institutions
DMBs	Deposit Money Banks
EXIM Bank Berhad	Export-Import Bank of Malaysia Berhad
EQUI	Capital Adequacy
FEM	Fixed Effect Model
FGLS	Feasible Generalized Least Square
FLC	Federal Lands Commissioner
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GLS	Generalized Least Square

INF	Inflation
LOAN	Liquidity
MFI	Minister of Finance Incorporated
MOA	Ministry of Agriculture and Agro-Based Industry
NCBFIs	Non-commercial Bank Financial Institutions
NIM	Net Interest Margin
NSE	Nigeria Stock Exchange
NSE	Nairobi Securities Exchange
OLS	Ordinary Least Square
POLS	Pooled Ordinary Least Square
PP	Philips- Perron
ROAE	Return on Average Equity
REM	Random Effect Model
ROA	Return on Assets
SIZE	Institutional Size
SMEs	Small and Medium Enterprises
SSA	Sub-Saharan Africa
VIF	Variance Inflation Factor

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PREFACE

This research paper is submitted in partial fulfillment of the requirement for Bachelor of Business Administration (HONS) Banking and Finance. The research is under supervision by Mr. William Choo Keng Soon.

In this research, return on assets (ROA) is being used to measure the Islamic Development Financial Institutions (DFIs) profitability and to make comparison analysis among the 6 different Islamic DFIs. ROA ratio indicates the performance of Islamic DFIs in generating profits. Generally, the higher the ROA ratio shows the more efficient the bank in utilizing its assets. The independent variables of Islamic DFIs have been categorized into institutional-specific variables and macroeconomic variables. The institutional-specific determinants are liquidity, liability, capital adequacy and institutional size. Meanwhile, the macroeconomic variables have included economic growth and inflation.

There are definitely a lot of hardships that we had passed through during the progress, but it make us feel worthwhile when we realized that we had learned something new and gain extra mile of knowledge. With no doubt, this kind of extra knowledge will help us in our future career life.

ABSTRACT

The establishment of Islamic Development Financial Institutions (DFIs) aids to improve the economic growth in Malaysia. The sectors that are promoted by Islamic DFIs include industrialization, export-oriented sector, infrastructure, agriculture, small and medium enterprises (SMEs), as well as high technology and capital-intensive sectors. Therefore, it is essential to improve the profitability and performance of Islamic DFIs to ensure their mandated goals can be achieved effectively and efficiently.

The objective of this study is to examine the significance relationships of the determinants of Islamic Development Institutions (DFIs) in Malaysia and the performance of each Islamic DFIs for the period from year 2009 to 2014. There are six different Islamic DFIs which are Agrobank, Bank Pembangunan Malaysia Bhd (BPMB), Bank Rakyat, Bank Simpanan Nasional (BSN), Small and Medium Enterprises (SME) and Lembaga Tabung Haji. Moreover, the Pooled Ordinary Least Square (POLS) Model is employed to conduct this research.

The results showed that the liability and capital adequacy are found to be significant to influencing the profitability of Islamic DFIs. However, liquidity, institutional size, economic growth and inflation are found to be insignificant in explaining the profitability of Islamic DFIs. On the other hands, Tabung Haji is the best perform Islamic DFIs among the others.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

A lot of countries, such as Malaysia, United States, and European countries employ specialized institutions which are known as Development Financial Institutions (DFIs) to attain its social-economic development. In Malaysia, the establishment of Islamic DFIs was taken as a strategy by the government to promote important sectors that could trigger the development of the country. Besides, it is a strategy that helps to improve the efficiency and performance of the Islamic Financial Institutions, which were growing rapidly after the liberalisation of Islamic Financial system. Therefore, it is essential to improve the profitability and performance of Islamic DFIs to ensure their mandated goals can be achieved effectively and efficiently.

1.1 Research Background

1.1.1 History of Islamic Development Financial Institutions (DFIs)

In Malaysia, Islamic DFIs were set up and funded by the government to develop and promote the key sectors in the overall socio-economic development of Malaysia. The sectors that are promoted by Islamic DFIs include industrialization, export-oriented sector, infrastructure, agriculture, small and medium enterprises (SMEs), as well as high technology and capital-intensive sectors. Besides, the institutions also support the financial of Islamic banks, which were ventured rapidly since the introduction of Islamic Banking Act 1983. It also supplements the banking institutions by filling the gaps in offering specialised financial products and services to the specific strategic sectors (Bank Negara Malaysia [BNM], 2016).

1.1.2 Development of Islamic Development Financial Institutions (DFIs)

Several initiatives, such as strengthening of the legal framework, building of capacity and capability as well as improving the operational efficiency of Islamic DFIs have been taken by the government. The purpose of these initiatives is to enhance and strengthen the performance of Islamic DFIs to ensure their mandated roles are performed efficiently and effectively.

Development Financial Institutions Act (DFIA) 2002 was established on 15 February 2002, which acts as a supervisory and comprehensive regulatory framework that enhances the financial and operational soundness of Islamic DFIs. DFIA inspects the targeted institutions to assure their mandated roles are handled prudently with best behaviours and strong corporate governance. It also acts as a guideline reference for all DFIs to ensure the implemented objectives and policies are compatible with government's goals in order to support the national economic development agenda (BNM, 2016).

According to BNM (2016), there are six Islamic DFIs regulated under DFIA 2002, including Bank Kerjasama Rakyat Malaysia Berhad (Bank Rakyat), Agrobank, Bank Pembangunan Malaysia Berhad (BPMB), Export-Import Bank of Malaysia Berhad (EXIM Bank), Small and Medium Enterprises Bank (SME Bank), and Bank Simpanan Nasional (BSN). On the other hand, Lembaga Tabung Haji, Malaysian Industrial Development Finance Berhad, Sabah Development Bank, Sabah Credit Corporation Berhad, Credit Guarantee Corporation Berhad (CGC), Borneo Development Corporation (Sabah) Sdn Bhd, and Borneo Development Corporation (Sarawak) Sdn Bhd are the seven DFIs that are not governed under DFIA 2002. Below are brief introductions for some selected DFIs in Malaysia.

1.1.2.1 Bank Kerjasama Rakyat Malaysia Berhad (Bank Rakyat)

Bank Rakyat was formed in year 1954 and was regulated under Bank Kerjasama Rakyat (M) Berhad Act 1978. The bank was the third bank to transform into a full-fledged Islamic cooperative bank. Presently, it is supervised by Co-operatives and Consumerism as well as Ministry of Domestic Trade. It offers financing to the members of Federal of Hawkers and Petty Traders Association Malaysia that venture in industry, services, wholesale and retail sectors.

The bank is considered as the major Islamic DFI in Malaysia, with a total asset of RM89.18 billion as recorded in year 2014. Besides, it has a total of 148 branches with over 800 cash deposit machines (CDM) and ATMs, as well as 91 Ar-Rahnu X'Change (Bank Kerjasama Rakyat Malaysia Berhad [Bank Rakyat], 2016).

1.1.2.2 Bank Pembangunan Malaysia Berhad (BPMB)

BPMB was established in year 1973, which is solely owned by the Government of Malaysia under the Minister of Finance Incorporated (MFI) and Federal Lands Commissioner. BPMB offers medium to long term fund to the infrastructure, technology, maritime, as well as oil and gas sectors in Malaysia.

BPMB had contributed to the economy by approving a total of 34 projects amounting to RM5.4 billion in year 2014. The net income of BPMB had increased to RM887.8 million with accumulated assets of RM29.2 billion in year 2014 (Bank Pembangunan Malaysia Berhad [BPMB], 2014).

1.1.2.3 Agrobank

Agrobank was established in year 1969, which was owned by the Government of Malaysia through MFI. The financing of the agricultural sector is based on the guidelines implemented by the Ministry of Agriculture and Agro-Based Industry (MOA) to ensure the financing can be provided to large agricultural community. The primary objective of Agrobank is to promote the soundness of agriculture sector in Malaysia by offering financing, takaful, advisory services and other credit facilities to the agriculture sector and agriculture-related business.

Agrobank had appeared as the strongest credit services provider to the agriculture sector by 1980. The bank's goal of becoming a full-fledged Islamic Bank before 2015 is achieved as 96% of the bank's financing portfolio was in Shariah-based as at year-end 2014. In year 2014, it had recorded a total net operating profit of RM220.81 million, with 190 branches and over 3,400 employees throughout Malaysia (Bank Pertanian Malaysia Berhad [Agrobank], 2016).

1.1.2.4 Bank Simpanan Nasional (BSN)

BSN was formed in year 1974 under the BSN Act 1974 and BSN (Amendment) Act 2010. It offers variety of banking products and services to the public with the vision of instilling the habit of thrift and saving among Malaysian. Besides, the funds of the banks are invested to finance the economic development of the nation to ensure everyone has the equal opportunity to enjoy a better life.

The totals assets of the bank were RM20 billion at the end of year 2010, which is about 38 times greater than the initial amount owned during its establishment. In the year of 2010, BSN has 5828 staffs with 856 ATMs and 384 branches nationwide to meet the demand of general public (Bank Simpanan Nasional [BSN], 2015).

1.1.2.5 Small and Medium Enterprises Bank (SME Bank)

SME Bank began its operation in year 2005. It is a full-fledged financial institution that formed through the process of rationalization between Bank Industri dan Teknologi Malaysia Bhd and Bank Pembangunan dan Infrastruktur Malaysia Bhd. The primary role of SME Bank is to provide financial and non-financial products and services to SMEs.

In the year of 2014, SME Bank had an operating profit of 212.8 million, which is 97% higher than the targeted profit. The bank had approved a total of 2.9 billion to 1,570 SME customers, with a customer satisfaction rate of 93.3% in year 2014 (Small and Medium Enterprises Bank [SME Bank], 2016).

1.1.2.6 Export-Import Bank of Malaysia Berhad (EXIM Bank)

Exim Bank was formed in year 1995, which was owned by the government under MFI. The bank offers credit facilities to support import and export of goods and services as well as overseas investment projects. It also provides advisory and insurance products and services in preserving the cross-border business in Malaysia.

In year 2014, EXIM Bank had recorded RM357.8 million of operating revenue, and RM10.83 million of total assets. Both of the operating revenue and total asset imply a growth rate of 31 percent and 32 percent respectively from previous year (Export-Import Bank of Malaysia Berhad [EXIM Bank], 2015).

1.1.2.7 Lembaga Tabung Haji

Lembaga Tabung Haji was established in year 1963 and is governed by the new Tabung Haji Act 1995. It is the first economic-based Islamic financial institution to manage pilgrimage activities for the Malaysian Muslim community. Besides, it also offers Syariah-based investment services and opportunities, including information technology, plantation, oil and gas, property and construction development, hospitality, as well as Islamic finance to enhance the economy of the Malaysian Muslims community.

In year 2016, Tabung Haji has a total of 122 branches with over 8.8 million depositors. It has a high international penetration by running a business in Jeddah, Kingdom of Saudi Arabia (Lembaga Tabung Haji, 2016).

1.1.3 Characteristics of Islamic Development Financial Institutions (DFIs)

Islamic DFIs have a high level of liquidity that come from large levels of paid-in-stocks, additional callable capital, exemptions on dividends and corporation tax, retained borrowings from returns on debt as well as equity investments. This characteristic enables them to withstand high risk and cooperate with high end customers. Moreover, Islamic DFIs have a higher default and markets risks as they engaged in medium and long-term financing to the targeted industries and strategic sectors of the economy (Velde and Warner, 2007).

Islamic DFIs also act as financial backups to support the targeted sectors in the country as they can be funded at lower costs and the institutions' debt can be guaranteed by the government. Instead of competing with the expanded banking institutions, Islamic DFIs are responsible in monitoring their area of comparative advantage to preserve the sustained relevance of Islamic DFIs and their effectiveness in this changing circumstance. Furthermore, Islamic DFIs invest in new information and communication technology to promote a better management and to enhance their competitive advantage in offering the financial product and services (Velde and Warner, 2007).

1.2 Problem Statement

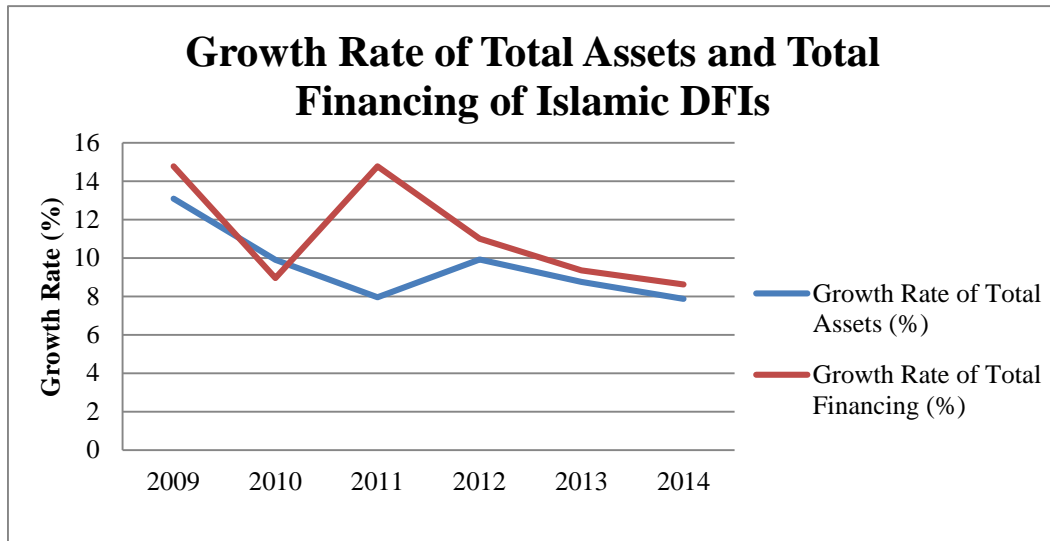
Islamic DFIs were established for the purpose of developing and promoting the key sectors that play the vital roles in the overall socio-economic development of Malaysia. Therefore, a sound and well-developed Islamic DFI can facilitate the national economic development agenda by mobilizing and channelling the financial resources to satisfy the financial needs of the targeted sectors. On the other hand, a poor and diluted Islamic DFI may cause financial instable and the retarding of economic growth. According to Islam (2012), the size of financial system in term of assets and its support for the financing needs of the economy can be used to imply the significance of the financial system in providing the financial resources. Table 1.1 shows the total assets and total financing in the form of loans and advances; and investments of the Islamic DFIs in Malaysia as well as their growth rates from the year of 2009 to 2014.

Table 1.1: Growth Rates of Total Assets and Total Financing of Islamic Development Financial Institutions (DFIs)

Year	Total Assets (RM' million)	Growth Rate (%)	Total Financing (Investment, loan & advances) (RM' million)	Growth Rate (%)
2009	164,709.2	13.10	126,818.8	14.77
2010	186,290.0	9.90	145,548.2	8.96
2011	204,726.5	7.95	158,586.1	14.77
2012	221,009.6	9.92	182,007.1	11.00
2013	242,925.6	8.75	202,035.4	9.36
2014	264,182.7	7.88	220936.9	8.63

Source: Bank Negara Malaysia, 2009-2014

Graph 1.1: Growth Rates of Total Assets and Total Financing of Islamic Development Financial Institutions (DFIs)



Source: Developed for the research via Excel 2013

Table 1.1 and graph 1.1 implies that the total assets and total financing are increasing over the years. However, the growth rate of total assets for each year is lesser than the growth rate of the total financing in the form of loans and advances, and investment in securities. This indicates that the financing activities of Islamic DFIs grew at a faster rate than the size of institutions. Even though the sizes of Islamic DFIs are growing over the periods, it is not great enough to capture the increasing of the financial needs of the targeted sectors. Therefore, it is acknowledged that Islamic DFIs need to improve their profitability and performance in order to achieve their mandated goals efficiently and effectively. With the financial and operational soundness of Islamic DFIs, their commercial commitment and national economic development agenda can be fulfilled.

According to Sufian and Parman (2009), loan-performance relationship relies heavily on the change in the economic and business cycle. Although loan is considered as the primary source of the institutions' income, it may cause an adverse impact on the profit especially during economic downturn. The positive relationship between loans and institutions' profitability has been concluded by Wasiuzzaman and Tarmizi (2010) who claims that financing are the major source of interest-bearing assets of a bank. Therefore, profit will be generated when the

deposits are transforming into loans as the lending rates are always greater than deposit rates. However, Smaoui and Salah (2012) conclude that loan has an adverse impact on the institutional profitability. The researcher suggests that default or non-performing loan is most likely to happen during economy downturn, which will affect their profitability. Thus, the research is carried out to examine whether Islamic DFIs in Malaysia can generate profit if the loans offered by the Islamic DFIs increase.

According to the studies conducted by Gul, Irshad, and Zaman (2011) as well as Owoputi, Kayode, and Adeyefa (2014), institutional profitability will increase when they receive more deposits, and vice versa. This is because Islamic DFIs rely heavily on deposits to attain greater return on assets (Gul et al., 2011). Deposits can be transformed into loans and other profitable investment activities to achieve higher profit (Owoputi et al., 2014). However Jabbar (2014) argues that deposits may extend to bad loan, which will cause a negative impact on the profitability of institutions. Therefore, it creates an issue on whether Islamic DFIs in Malaysia is able to gain profit if they have high volume of deposits.

DFIA 2002 requires all banks to maintain a minimum capital adequacy of eight percent to ensure their risk exposure is backed up by an adequate amount of liquid capital. Well-capitalized institutions are important to enhance the public confidence towards the banking system as they have better cushions to absorb risk and the flexibility to resolve the unanticipated losses. The findings of Obamuyi (2013) support these statements by claiming that well-capitalized institutions can enhance their capability in undertaking risk and accessing funds at low costs. Meanwhile, Noman (2015) suggests that the relationship between capital adequacy and profitability is negative. The researcher claims that institutions that retain higher amount of capital adequacy will lose the opportunities to earn greater return due to lower risk exposure. Therefore, the research is conducted to have a comprehensive overview on the influence of capital adequacy on the profitability of Islamic DFIs in Malaysia.

The theory of economies of scale suggests that growing institutional size has a positive impact on its profitability. Large institutions can produce goods and services besides process and gather information more efficiently at a lower cost. Moreover, they can enhance their profits by having a better diversification and a wider range of financial instruments. This theory is conformed to the study of Sufian and Parman (2009). However, Francis (2013) is having a contrast conclusion. Francis (2013) claims that there is a negative relationship between institutional size and its profitability after a certain limit. It is because large institution will face higher risk and incur other cost factors which will cause a negative impact to the profitability of the institution. The viewpoints arise an issue that growing firm size may result in different outcome on different institutions and country. Thus, this research is carried out to study the relationship between institutional size and the profitability of Islamic DFIs, besides examine whether the theory of economies of scale is supported among the Islamic DFIs in Malaysia.

Gross domestic product (GDP) causes distinct influences on different financial institutions due to the dissimilarities in the business structure and landscape. During economic boom, borrowers are expected to increase their demand on loan and other banking services. This is supported by Wu, Chen, and Shiu (2007) who state that the profitability of China has increase when per capita GDP has grown. However, Noman, Chowdhury, Chowdhury, Kabir and Pervin (2015) found that higher productivity is unfavourable to the financial institutions in Bangladesh. Motivated by the dispute among the effects, this research will study the impact of GDP on the profitability of Islamic DFIs in Malaysia.

According to Abduh and Idrees (2013), inflation is related to higher expenditure and higher income level. If the inflation is expected by the bank and bank has made revision on the interest rate based on the expected inflation rate, revenue will increase faster than the costs and thus contribute to the profitability of institutions. This is in line with the research conducted by Abduh and Idrees (2013). In contrast, Abduh and Alias (2014) are having opposite conclusion where the relationship should be negative. This is because when inflation is not expected by the bank, it

may cause the costs increase more rapidly than income and thus deteriorate institutional profit. Besides, the purchasing power of public will be lower during inflation, which will lead to the reduction in the amount of saving and the demands of loans. These scenarios will lower the profitability of institutions. Hence, this research is conducted to make a more appropriate claim on the effect of inflation on the profitability of Islamic DFIs in Malaysia.

There are some Islamic DFIs have grown and extended their former responsibilities to embark in commercial activities in order to increase their earning potential. However, it has resulted in inadequacy of the resources in the institutions, besides putting pressure on the management and organisational capabilities as well as technical expertise (BNM, 2016). These will cause an adverse impact on the performance of Islamic DFIs and thus public will lose interest and confidence towards the institutions. Therefore, this research is conducted to make a comparative analysis on the performance of Islamic DFIs in Malaysia.

In short, different researchers may come out with distinct conclusion due to the dissimilarity on the model applied and samples used. Thus, a specific research is needed to make an efficient claim on the relationship between the profitability of Islamic DFIs in Malaysia with the determinants. Besides, the performance of Islamic DFIs is needed to be evaluated to have a comprehensive overview on the development and the potential growth of the Islamic DFIs in Malaysia.

1.3 Research Objectives

1.3.1 General Objective

To determine the relationship between institutional-specific variables and macroeconomic variables with the profitability of Islamic DFIs in Malaysia.

1.3.2 Specific Objective

- I. To determine the relationship between liquidity and the profitability of Islamic DFIs in Malaysia.
- II. To determine the relationship between liability and the profitability of Islamic DFIs in Malaysia.
- III. To determine the relationship between capital adequacy and the profitability of Islamic DFIs in Malaysia.
- IV. To determine the relationship between institutional size and the profitability of Islamic DFIs in Malaysia.
- V. To determine the relationship between gross domestic product (GDP) and the profitability of Islamic DFIs in Malaysia.
- VI. To determine the relationship between inflation rate and the profitability of Islamic DFIs in Malaysia.
- VII. To make comparison analysis on the performance of Islamic DFIs in Malaysia.

1.4 Research Question

- I. Does liquidity significantly influence the profitability of Islamic DFIs in Malaysia or vice versa?
- II. Does liability significantly influence the profitability of Islamic DFIs in Malaysia or vice versa?
- III. Does capital adequacy significantly influence the profitability of Islamic DFIs in Malaysia or vice versa?
- IV. Does institutional size significantly influence the profitability of Islamic DFIs in Malaysia or vice versa?
- V. Does gross domestic product (GDP) significantly influence the profitability of Islamic DFIs in Malaysia or vice versa?
- VI. Does inflation rate significantly influence the profitability of Islamic DFIs in Malaysia or vice versa?
- VII. Which Islamic DFI in Malaysia has the best performance among others?

1.5 Hypothesis of the study

1.5.1 Liquidity

H_0 : Liquidity is insignificantly influences the profitability of Islamic DFIs in Malaysia.

H_1 : Liquidity is significantly influences the profitability of Islamic DFIs in Malaysia.

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1.5.2 Liability

H_0 : Liability is insignificantly influences the profitability of Islamic DFIs in Malaysia.

H_1 : Liability is significantly influences the profitability of Islamic DFIs in Malaysia.

1.5.3 Capital adequacy

H_0 : Capital adequacy is insignificantly influences the profitability of Islamic DFIs in Malaysia.

H_1 : Capital adequacy is significantly influences the profitability of Islamic DFIs in Malaysia.

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1.5.4 Institutional size

H_0 : Institutional size is insignificantly influences the profitability of Islamic DFIs in Malaysia.

H_1 : Institutional size is significantly influences the profitability of Islamic DFIs in Malaysia.

1.5.5 Gross Domestic Product (GDP)

H_0 : GDP is insignificantly influences the profitability of Islamic DFIs in Malaysia.

H_1 : GDP is significantly influences the profitability of Islamic DFIs in Malaysia.

1.5.6 Inflation

H_0 : Inflation rate is insignificantly influences the profitability of Islamic DFIs in Malaysia.

H_1 : Inflation rate is significantly influences the profitability of Islamic DFIs in Malaysia.

1.6 Significance of Study

This study attempts to add to the existing literature by addressing the profitability of Islamic DFIs in Malaysia associated with the independent variables. It is because related study investigating the profitability and performance of Islamic DFIs in Malaysia is scant as majority of the existing studies emphasize on the determinants of Islamic and conventional banks. Realizing from the scarcity of studies in this research, both of the internal and external factors, including liquidity, liability, capital adequacy, institutional size, GDP and inflation were examined as the determinants to investigate their effects on the profitability of Islamic DFIs in Malaysia. Besides, the comparative analysis on the performance of the Islamic DFIs in Malaysia was conducted in order to evaluate and compare their financial strength and ability in performing their commercial commitment.

1.6.1 Institutional Managers

This study is beneficial to the managers of Islamic DFIs in order to provide them with a better knowledge on the factors determining the profitability of the institutions. Institutional manager can use the empirical result of this study to formulate new strategies, such as including a policy on minimise the acceptable debt service ratio and also requirement for analysing net funding requirements under alternative scenario. Besides, this study can be used as a guideline for the institutional manager to decide which factors to be emphasised on in order to improve the overall performance and long term survival of the institutions

1.6.2 Government

This research is significant to the government as it can show the government on how the performance of Islamic DFIs can contribute to the economic growth in Malaysia. Moreover, Islamic DFIs are established with the role of promoting economic growth in Malaysia by developing and financing the targeted strategic sector in the country. Therefore, government is able to decide which internal (Liquidity, liability, capital adequacy and institutional size) and external factors (GDP and inflation) to be focused on in order to ensure the steadily growth of the Islamic DFIs. Government can intervene the interest rate and money supply through Bank Negara Malaysia, as well as reserve requirements that required to be held by the Islamic DFIs in the effort of implementing monetary policy and fiscal policy to control the inflation rate.

1.6.3 Academicians

This study is important to the academicians as new academic evidences on the relationship between the profitability of Islamic DFIs and its determinants will be generated. The result of this study may shed some light on the significant of the profitability of Islamic DFIs towards the economic growth of a country. The academicians may also extend the study to other areas of the Islamic DFIs as well, including the determinants affecting the non-performing loans of Islamic DFIs, the loan financing strategy focused by Islamic DFIs as well as awareness of Islamic DFIs among citizens in Malaysia.

1.6.4 Public Investors

Public investors will get a better insight of the growing trend of Islamic DFIs. It also gives some ideas to the public investors on the diversification pooled of funds in Islamic DFIs due to lower risk it contained compared with conventional bank investment that is very dynamic. It is because Islamic DFIs can be funded at lower costs and the institutions' debt can be guaranteed by the government. On the other hand, conventional bank investment is very volatile toward the changes in interest rate and market structure which might create a more dynamic investment opportunities. Therefore, the research is useful for public investors in evaluating the investment risk in order to ensure a right investment decision is made.

1.7 Chapter layout

1.7.1 Chapter 1: Research Overview

In chapter one, introduction and background of the research topic are discussed. Besides, the problem statement, research objectives, research hypothesis and the significance of study are also included in this chapter.

1.7.2 Chapter 2: Literature Review

In chapter two, literature review on the study conducted by previous researchers will be included. Besides, the issues, finding and methodologies conducted by previous researchers will also be reviewed in this section.

1.7.3 Chapter 3: Methodology

In chapter three, data collection method, sources of data, sample size and the methods on this research topic will be included.

1.7.4 Chapter 4: Result Analysis

In chapter four, the empirical result will be conducted and reported in this section. Besides, the result generated will be compared with the result of past researchers in this section.

1.7.5 Chapter 5: Conclusion

In chapter five, the major findings and conclusion will be included. Besides, the policy implications and recommendations for future research will be discussed in this section.

1.8 Conclusion

In short, the primary goal of this research is to determine the impact of institutional-specific variables and macroeconomic variables on the profitability of Islamic DFIs in Malaysia. Besides, this research also makes a comparative analysis on the performance of Islamic DFIs in Malaysia to evaluate and assess their financial strength and ability in performing their commercial commitment. The research is essential for government, institutional manager, investors and academicians in order to have a comprehensive understand about the development and the potential growth of Islamic DFIs in Malaysia today.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

The comprehensive reviews of studies done by previous researchers on the relationship between the determinants with the profitability of financial institutions as well as the measurements to evaluate the performance of the financial institutions were included in this chapter. In addition, the methodologies and findings of previous studies had been highlighted to enhance the reliability of theoretical model and relevant variables proposed in this research.

This research will concentrate on the relationship between the profitability of Islamic Development Financial Institutions (DFIs) with institutional-specific factors and macroeconomic factors, including liquidity, liability, capital adequacy, institutional size, gross domestic product (GDP) and inflation. Besides, the comparative analysis on the performance of Agrobank, Bank Rakyat, Small and Medium Enterprise Bank (SME Bank), Bank Pembangunan Malaysia Berhad (BPMB), Bank Simpanan Nasional (BSN) and Lembaga Tabung Haji will also be conducted in this research. This chapter consists of five sections; which are review of literature, review of theoretical frameworks, review of theoretical model, proposed conceptual framework as well as hypothesis development.

2.1 Literature Review

2.1.1 Independent variables: Institutional-Specific Determinants

2.1.1.1 Liquidity (Loan to asset ratio)

Liquidity of Islamic DFIs can be measured by the ratio of loan to assets (Husain, Affandi, and Shukur, 2015). Too high of loan to asset ratio indicates that the financial institutions might face difficulties to handle any unforeseen fund requirements; whereas too low of loan to assets ratio implies that the financial institutions may underutilize their asset to generate profits.

Izhar and Asutay (2007) aimed to study the performance of Bank Muamalat Indonesia (BMI) by analyzing the internal and external determinants. To study the internal determinants, a data set was taken from financial statement of BMI from the year of 1996 to 2001. On the other hand, the data of external determinants was obtained from Bank Indonesia's financial statistics. The result shows that loans to total assets affect the profitability of BMI negatively and significantly. It implies that short term financing has less impact on the Islamic banking portfolio as these loans are less risky and less profitable (Izhar and Asutay, 2007).

Noman (2015) conducted a study to determine the effects of bank-specific and macroeconomic factors on the profitability of Islamic Banks in Bangladesh. This study included 7 Islamic Bank in Bangladesh and covered the period from the year of 2003 to 2013. The result indicates that the relationship between loans over assets with the profitability of Islamic Banks is negative but insignificant. Noman (2015) proposed that Islamic Banks in Bangladesh should retain low level of liquidity to enable investment in profitable project especially in the newly established Mudarabah inter-bank market in the country.

Apart from that, Husain, Affandi, and Shukur (2015) conducted a research to examine the relationship between the internal determinants with the profitability of Islamic Banks in Malaysia. In this research, a set of data that consists of 16 Islamic banks, covering the year of 2008 to 2012 was collected. The result concludes that the relationship between liquidity and the earning of Islamic Bank in Malaysia is positive but insignificant. It implies that liquidity is not the main variable in determining the earning of Islamic Bank in Malaysia.

Ariffin and Tafri (2014) had conducted a research regarding the impact of financial risk on the profitability of Islamic Banks. The data of this research was obtained via Bankscope database which consists of 65 full fledged Islamic Banks' annual report across the world from year 2004 to 2011. The finding of this research reveals that liquidity influences the profitability of Islamic Bank positively but insignificantly. The results indicate that liquidity cannot be assumed as the major variable in determining the profitability of full fledged Islamic Banks.

Sayed (2014) aimed to study the internal and external factors in determining the profitability of Nigeria Bank. The sample of this study consists of 15 banks that were listed in Nigeria Stock Exchange (NSE) from year 2006 to year 2011. The result of this research shows that liquidity

influences the profitability of Nigeria Bank positively but insignificantly. Although liquidity is insignificant to the profitability of bank, Sayedi (2014) stated that liquidity level need to be maintained and raised as liquidity can bring a small positive influence to the profitability of banks.

Subsequently, majority of the research indicates that loans over total assets have a positive but insignificant relationship with the profitability of financial institutions. Researchers such as Ariffin and Tafri (2014), Husain et al. (2015) as well as Sayedi (2014) support this evidence because higher liquidity will influence the profitability of financial institution positively. However, the relationship is insignificant because liquidity is not the major variable in determining the profitability of financial institutions. Meanwhile, some researchers have contradict views that liquidity will affect the profitability of financial institutions negatively (Izhar and Asutay, 2007 and Noman, 2015) because short term financing is less risky and less profitable.

2.1.1.2 Liability (Deposit to asset ratio)

According to Amba and Almkharreq (2013), deposit to asset ratio is a liability indicator for financial institutions as financial institutions are liable to all the deposits that placed by the depositors. Deposit is a crucial variable in determining the profitability of financial institutions as they are the main source of funding for financial institutions (Dawood, 2014).

Muda, Shaharuddin, and Embaya (2013) studied the factors and the effects of global financial crisis on the profitability of Islamic Banks in Malaysia. The research included a sample of seventeen Islamic financial institutions in Malaysia which cover from the years of 2007 to 2010. The result of this research indicates that the correlation between the profitability of Islamic Bank in Malaysia with liability is positive and significant. Muda et al. (2013) stated that higher deposits can be transformed into financing which will increase the profitability of the financial institution eventually.

The empirical result of Muda et al. (2013) is supported by Owoputi, Kayode, and Adeyefa (2014) who investigated the influences of institutional-specific and external factors on the profitability of bank in Nigeria. The research employed the data of 10 Deposit Money Banks (DMBs) in Nigeria over the period of 1998 to 2012. The outcome of this research implies that deposits over assets influence the profitability of Nigeria Banks positively and significantly. According to Owoputi et al. (2014), the profitability of financial firm will rise when the deposit is transforming into profitable investment and other financing activities.

Gul, Irshad, and Zaman (2011) had conducted a study on the impacts of bank specific and external factors on the profitability of commercial banks in Pakistan. This research used the data of fifteen commercial banks in Pakistan, which covered the year of 2005 to 2009. The result of this research

shows that liability influences the profitability of commercial bank positively and statistically significant. Gul et al. (2011) explained that deposit is the source of funds that will contribute to the profitability of financial institutions.

Nahang and Araghi (2013) had studied a research regarding the impacts of internal factors on the profitability of city banks. The period of this research covered from the year of 2009 to 2012. The outcomes of this research indicate that deposits over assets influence the profitability of bank negatively and significantly. According to Nahang and Araghi (2013), short term deposit will reduce the bank profitability and only the long term deposit will enhance the bank profitability.

Jabbar (2014) had conducted a research to determine the factors influencing the earnings of Pakistan banks. This research contained a sample of thirty one commercial banks in Pakistan that covered the period from year 2009 to 2012. Jabbar (2014) found that deposits ratio is negatively and significantly correlated with ROA. It implies that the deposits which have been extended as the bad loans will lower the profitability of the banks.

Most of the researchers including Gul et al. (2011), Muda et al. (2013), and Owoputi et al. (2014) concluded that deposits ratio can positively affect the profitability of financial institutions. In contradict, the empirical results of Jabbar (2014) as well as Nahang and Araghi (2013) concluded that deposits ratio can significantly and negatively influence the profitability of financial institutions.

2.1.1.3 Capital Adequacy (Equity to Asset ratio)

Capital adequacy ratio (CAR) is the measurement of the capital stability of the banking institutions as well as the ability of financial institution to withstand the losses (Obamuyi, 2013). The ratio can be obtained by using total equity divided by total assets (Obamuyi, 2013).

Smaoui and Salah (2012) had conducted a research to study the impacts of firm-specific characteristic and macroeconomic impacts on the earnings of Islamic Banks in Gulf Cooperation Council (GCC) countries. The sample was taken from BankScope database which consists of forty four Islamic Banks in GCC countries that covered the period from year 1995 to 2009. The result shows that the capital strength influences the bank positively and significantly. Smaoui and Salah (2012) claimed that well-capitalized banks have lower costs and higher profit because the banks can be funded externally at lower costs.

The aim of the research conducted by Obamuyi (2013) is to study the impacts of bank capital on the profitability of Nigeria banks. The data of this research is based on the financial statements from twenty banks in Nigeria that covered the period of 2006 to 2012. The result of this research is consistent with the findings of Smaoui and Salah (2012) which indicates that capital affects the bank profitability positively and statistically significant. Obamuyi (2013) stated that well-capitalized banks are more capable to attract cheaper funds and assume risk.

The research conducted by Samhan and Khatib (2015) was aimed to identify the impact of macroeconomic and bank specific factors on the financial performance of Jordan Islamic Bank. The period of this research covered from year 2000 to 2012. The result shows that equity ratio is positively and significantly correlated with ROA in Jordan Islamic Bank. Samhan and

Khatib (2015) suggested that Jordan Islamic bank has to increase their equity ratio in order to improve the ROA.

On the other hand, Wasiuzzaman and Tarmizi (2010) conducted a study to investigate the linkage between bank internal and external factors with the profitability of Islamic Banks in Malaysia. The research included sixteen private and public Islamic Banks in Malaysia from year 2005 to 2008. The results of this research indicate that equity have an inverse but insignificant relationship with the profitability of Islamic Bank in Malaysia. Wasiuzzaman and Tarmizi (2010) stated that higher equity ratio indicates lower bank efficiency ratio and higher agency cost as well as financial distress. Therefore, banks should emphasize on the leverage value instead of equity capital in order to be more profitable.

The research conducted by Abduh and Idrees (2013) is to determine the impacts of bank internal, industry-specific, and macroeconomic indicators on the profitability of Islamic Banks in Malaysia. The data of this research consists of ten Islamic Banks in Malaysia which covered the period from year 2006 to 2010. The outcome of this research reveals that capital is negatively and insignificantly correlated with bank profitability.

In summary, there are different views on the relationship between capital adequacy with the profitability of financial institutions. Obamuyi (2013), Samhan and Khatib (2015) as well as Smaoui and Salah (2012) agreed that capital influences the profitability of financial firm positively and statistically significant. This relationship implies that capital is one of the major factors in determining the profitability of financial institutions. In contradict, Abduh and Idrees (2013) as well as Wasiuzzaman and Tarmizi (2010) have different view on the result where they stated that capital has negative impact on the profitability of financial institution.

2.1.1.4 Institutional size (Log of total assets)

Institutional size is employed to examine how size is associated to the profitability of institutions (Wasiuzzaman and Tarmizi, 2010). Natural Logarithm of total asset owned by the bank is often used to measure institutional size.

Abduh and Alias (2014) conducted a research to study the determinants of the Islamic banks' performance in Malaysia. The research used a sample data of fifteen Islamic Banks in Malaysia that covered from the year of 2006 to 2010. Abduh and Alias (2014) expected that bank size will positively affect the bank performance at the very first of the study. However, the statistical results generated show negative and insignificant relationship between bank size and bank performance, which were contrast with the initial expectation.

The aim of the research conducted by Almazari (2014) is to examine the influences of internal determinants on the bank profitability in Saudi Arabia and Jordan. This research included twenty three banks from Saudi Arabia and Jordan that covered the period from year 2005 to 2011. The result of this research shows that bank size will influence bank profitability negatively and statistically insignificant as larger bank will face diseconomies of scale and the profit will be diminished.

Francis (2013) had conducted a study in Sub-Saharan Africa (SSA) regarding the effects of bank-specific and macroeconomic factors on the profitability of commercial banks. The data of this research was obtained from forty two countries which comprised of 216 commercial banks that covered from year 1999 to 2006. The outcome of this research states that bank size affect the bank profitability negatively and statistically significant. Francis (2013) suggested that smaller institutional size tend to be more efficient compared with large institution.

Wasiuzzaman and Gunasegavan (2013) had conducted a research to examine the differences in bank features of conventional and Islamic banks in Malaysia. Fourteen banks were included in this research where nine of them were conventional banks and the remaining was Islamic banks. The study covered the period from year 2005 to 2009. The empirical results of this research implies that bank size tend to affect the profitability of bank positively and significantly. According to Wasiuzzaman and Gunasegavan (2013), theory of economies of scales is applicable to large bank as the cost of collecting and handling the information can be reduced. Moreover, large bank has more opportunity in diversifying their investment.

Apart from that, Sufian and Parman (2009) studied the determinants of non-commercial bank financial institutions (NCBFIs) in Malaysia from year 2000 to 2004. The result of this research shows that bank size influence the profitability of NCBFIs positively and significantly. Sufian and Parman (2009) explained that large NCBFIs are more profitable because their inputs are cheaper. Furthermore, their returns increase once the volume of services exceeds the fixed cost.

In brief, most of the researchers including Abduh and Alias (2014), Almazari (2014) as well as Francis (2013) concluded that the relationship between bank size and bank performance is negatively correlated, but Abduh and Alias (2014) and Almazari (2014) failed to prove the significance of negative relationship. In contrast, Sufian and Parman (2009) and Wasiuzzaman and Gunasegaven (2013) concluded that bank size can significantly and positively influence the profitability of banks.

2.1.2 Independent variables: Macroeconomic Determinants

2.1.2.1 Gross Domestic Product (GDP)

Gross domestic product (GDP) is referred as the value of country's production or economic growth of a country in a specific time period (Abduh and Alias, 2014).

Kiganda (2014) studied the effects of macroeconomic variables on the profitability of commercial banks in Kenya from year 2008 to 2012. The result of this research shows that the relationship between GDP and the profitability of commercial bank in Kenya is positive but insignificant. Kiganda (2014) explained that the profitability of commercial bank in Kenya will generally be affected by internal factors instead of macroeconomic factors.

The aim of the research conducted by Simiyu and Ngile (2015) is to study the correlation between macroeconomics factors with the profitability of commercial banks. A sample data of ten commercial banks that are listed in Nairobi Securities Exchange (NSE) from the period of 2001 to 2012 were included in this research. The finding of this research shows that the relationship between economic growths with the earnings of commercial banks is positive but insignificant. According to Simiyu and Ngile (2015), economic growth will influence the profitability of commercial bank indirectly and it is not the major determinant of bank profitability.

The study of Lee and Kim (2013) investigated the determinants and performance of Korean Banks from the year 2003 to 2010. The results show that growth in GDP is positively and statistically significant to the profitability of banks. According to Lee and Kim (2013), bank profitability can be influenced by the country's business cycle easily.

Besides that, Bilal, Saeed, Gull, and Akram (2013) had conducted a research to study the effect of bank-specific and macroeconomic factors on the profitability of commercial banks in Pakistan. The period of this study covered from the year of 2007 to 2011. The finding of this research indicates that GDP influences the profitability of commercial banks positively and significantly. Bilal et al. (2013) explained that that the economy of the country is booming when GDP is growing. Therefore, the level of productivity in the country will increase and thus increase the bank profitability.

Furthermore, Wu, Chen, and Shiu (2007) investigated the impact of bank qualities and financial development through the operational performance among commercial bank in China. This research had included fourteen Chinese banks which covered the period from year 1996 to 2004. The outcome of this research indicates that GDP per capita affect the ROA of bank positively and significantly. This shows that a higher value of GDP would improve the performance of the banking sector. According to Wu et al. (2007), standard of living will rise when the economy is growing and people will have surplus money to deposit in bank. Indirectly, banks have more funds to be loaned out which in turn lead to higher profitability.

Noman, Chowdhury, Chowdhury, Kabir and Pervin (2015) studied the effect of bank-specific and macroeconomic variables on the banks earnings in Bangladesh. Thirty five banks in Bangladesh were included in this research. The finding of this research shows that GDP influence the profitability of Bangladesh banks negatively and statistically significant. Noman et al. (2015) mentioned that higher productivity is unfavourable to the bank in Bangladesh.

Conclusively, majority of the researchers concluded the GDP affect the profitability of financial institutions positively. Although Bilal et al. (2013), Lee and Kim (2013) as well as Wu et al. (2007) prove that GDP influence the profitability of financial institutions significantly, Kiganda (2014) as well as Simiyu and Ngile (2015) argued that the economic growth is insignificant to the profitability of the financial institutions. This is because internal factors are the main variables in determining the bank profitability. On the other hand, the finding of Noman et al. (2015) is contradicting with other researches as Noman et al. (2015) argued that GDP influence the bank profitability negatively and statistically significant.

2.1.2.2 Inflation

Inflation is referred as the overall increases in the price level of products and services. When the price level increase, the purchasing power will decrease and each unit of currency is able to buy fewer goods and services. According to Smaoui and Salah (2012), the value of revenues and costs may be affected by inflation. Abduh and Idrees (2013) stated that inflation tend to increase the cost and income. The connection between inflation and bank earning is positive when the income of the banks increases faster than costs. In contrast, the correlation between inflation and bank profitability is negative when the costs of bank increase faster than income.

Abduh and Alias (2014) conducted a study to determine the variables influence the profitability of fifteen Islamic Banks in Malaysia from year 2006 to 2010. The outcome of the research reveals that inflation influences the profitability of Islamic Banks negatively and insignificantly. According to Abduh and Alias (2014), inflation will cause the operating costs of financial institutions to increase which will eventually lower the profitability of Islamic banks in Malaysia.

Another research had been conducted by Kanwal and Nadeem (2013) to determine the connection between macroeconomic factors and the profitability of commercial banks in Pakistan. The sample of this research included eighteen commercial banks in Pakistan and covered the period from year 2001 to 2011. The result of this research indicates that the relationship between inflation and the profitability of commercial bank in Pakistan is negative and statistically insignificant. According to Kanwal and Nadeem (2013), inflation will affect the profitability of bank negatively and it is not the major factor to influence the bank earning because the interest rate will adjust to the inflation rate accordingly.

Tan and Floros (2012) had conducted a research on the effect of inflation on the profitability of banks in China. The data of this research was obtained from 101 banks in China from year 2003 to 2009. This research found that the correlation between the profitability of banks and inflation in China is positive and statistically significant. Tan and Floros (2012) stated that China banks need to adjust the interest rate in order to withstand the effect of inflation. Indirectly, this will cause the revenue of banks to increase faster than the cost and thus lead to higher earnings.

A study had been conducted by Al-Kayed, Zain, and Duasa (2014) to investigate the linkage between capital structures with the profitability of Islamic Banks. The research used eighty five Islamic banks from nineteen countries that covered the period from year 2003 to 2008. The empirical

result indicates that the correlation between inflation and the profitability of Islamic banks is positive but insignificant. According to Al-Kayed et al. (2014), when the inflation is anticipated, the bank tends to adjust to the lending rate in order to enhance the earnings of Islamic bank.

Wasiuzzaman and Tarmizi (2010) conducted a research to determine the effects of bank internal and external variables on the profitability of Islamic Bank in Malaysia. The scope of this research included sixteen private and public Islamic Banks in Malaysia from year 2005 to 2008. The result of this research implies that inflation affects the Islamic banks positively and significantly. Wasiuzzaman and Tarmizi (2010) explained that banks can adjust to the rate of profit sharing accordingly when they are able to forecast the future inflation correctly.

In a nut shell, researchers including Al-Kayed et al. (2014), Tan and Floros (2012) as well as Wusaiuzzaman and Tarmizi (2010) supported positive relationship between inflation and bank profitability. However, the finding of Al-Kayed et al. (2014) shows that the association between inflation and bank profitability is insignificant. On the other hand, Abduh and Alias (2014) as well as Kanwal and Nadeem (2013) argued that inflation tends to affect the profitability of bank negatively. However, Abduh and Alias (2014) and Kanwal and Nadeem (2013) failed to prove the significance of the relationship which shows that inflation is not the major determinants on the profitability of the banks.

2.1.3 Performance of Firm

Performance of firm is an important indicator to show the effectiveness of a firm. It can be determined by several measurements such as financial performance, shareholder return and product market return (Ofoeda, Gariba, and Amoah, 2016). Generally, ROA is the most common financial ratio that used to measure the financial performance of a firm. The formula of ROA is earning after tax over total asset. A high value of ROA indicates that the performance of the firm is better as the firm can generate higher profit by utilizing the assets effectively.

Ofoeda et al. (2016) study the effects of regulations on the performance of NBFIs in Ghana. In order to determine the performance of the NBFIs, the researchers use the information from financial report to measures the ROA of NBFIs. Ofoeda et al. (2016) found that the ROA is greater if there is a regulations pressure on capital adequacy requirement.

Osorio, Colino, and Martin (2016) carried a research on whether the firms' size is really matter on the international diversification-link performance in Spain. The research used ROA as the dependent variable to measure the firm performance as ROA is an important economic performance indicator in evaluating the efficiency and effectiveness of business management.

Vithessonthi and Racela (2015) identified the relationship between R&D intensity, short-and long-run effects of internationalization with firm performance. Several measurements were employed by the researchers to evaluate the firm performance. ROA and ROE are the two operating performance evaluation methods while annual stock returns and Tobin's Q are the two financial performance evaluation methods. As cited in Teeratansirikool, Siengthai, Badir, and Charoenngam (2013), there are many methods can be used to measure the performance of a firm. The methods consist of increase of revenues, ROE, ROI, market share, quality of products and services.

In short, performance can be measured in various ways. Most of the researches including Ofoeda et al. (2016), Osorio et al. (2016) and Vithessonthi and Racela (2015) suggested that performance of the firm can be measured by ROA. Apart from ROA, ROE is another measurement that employed by most of the researchers, including Ofoesa et al. (2014), Teeratansirikool et al. (2013) and Vithessonthi and Racela (2015).

2.2 Review of Theoretical Framework

2.2.1 Ordinary Least Square (OLS) Model

Ordinary Least Square (OLS) Model is normally chosen to give the best fit of coefficients for future prediction by assuming all the assumptions are met (Wasiuzzaman and Tarmizi, 2010). The priority goal of OLS model is to identify the linear connection of the model in the study.

OLS model is used to examine the significance of the relationship between the explained and explanatory variables besides to examine the significance of the variables used in the t-statistic. Sufian and Parman (2009) had performed OLS model to examine the relationship and significance of the variables that used in the model:

$$\Pi_{jt} = f\left(\beta_0 + \beta_1 \Sigma NCBFI_{characteristics_{jt}} + \beta_2 \Sigma Economic_{conditions_t} + \beta_3 \Sigma specialization_{jt}\right) + \varepsilon_{jt}, \quad \varepsilon_{jt} = v_{jt} + u_{jt}$$

Π_{jt} is the profitability of non-commercial bank financial institutions at time t, β_1 , β_2 , and β_3 are the coefficients of the determinant variables, and ε_{jt} is the unobserved NCFBI-specific effect (v_{jt}) + idiosyncratic error which is independently identically distributed (u_{jt}). OLS model is tested even after the empirical work of White test, which is also used to test the relationship and significance of the variables in the study. The study found that the independent variables were strong in the relationship direction toward the ROA by using OLS model.

Furthermore, OLS model was adopted by Tan and Floros (2012) to determine the impact and strength of the impact level of different roles on the profitability of European banks. The study consists of unbalanced panel annual data with a total of 197 observations and composed of several variables such as inflation, GDP and cost efficiency. Tan and Floros (2012) claimed that size would indirectly influence the profitability, while market power and x-efficiency would direct influence the profitability of banks.

Wasiuzzaman and Tarmizi (2010) stated that the tremendous changes of economic in United States during year 2008 had increased the default rate of several financial service companies. However, Islamic banking industry was not affected severely during that time. Wasiuzzaman and Tarmizi (2010) imitate the same conditions in Malaysia and solve the probably outcomes. Linear regression was created to examine the outcome:

$$P_{qt} = c + \sum \alpha_i B_{qit} + \sum \beta_i X_{kt} + U_{it}$$

P_{qt} is the revenue generated by bank that represented in the form of ROA, B_{qit} is specific bank charter at time t, X_{kt} is k^{th} macroeconomic variable at time t and U_{it} is the error term. OLS model was adopted in this study to investigate the relationship between profitability of banks with bank specific and macroeconomic variables. It is found that Islamic bank should concern on the credit quality and credit portfolios as the quality of provision in Islamic finance market depends on it.

According to Noman (2015), loan is not the major variable in determining the profitability of banks in Bangladesh. Bangladesh is not required to pay much attention on capitalizations because the profits of bank would react oppositely with capitalization ratio. Therefore, simple OLS model was employed to examine the econometric issues on the profitability of banks in Bangladesh.

The coefficient of several variables on the impact of the profitability of Islamic and conventional banks was discovered in the research conducted by Wasiuzzman and Gunasegavan (2013). T-test was employed in the study to examine the coefficient variables and the relationship between the profitability (ROA) with the explanatory variables as well as the significance of the variables.

2.2.2 Pooled Ordinary Least Square (POLS) Model

Pooled Ordinary Least Square (POLS) model neglects the panel nature of data and assumes the disturbance term is identically and independently distributed and uncorrelated with the independent variables (Noman, 2015). POLS model is assumed to have no time effects, have a constant intercept and slopes. Abduh and Alias (2014) as well as Noman (2015) are the previous researchers that employed POLS model in examining the determinants of the bank performance.

$$Y_{it} = \beta_0 + \beta_1 LLPTA_{it} + \beta_2 NLTA_{it} + \beta_3 TOTA_{it} + \beta_4 SER_{it} + \beta_5 BS_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + \mu_{it}$$

Equation above was developed by Abduh and Alias (2014) in the study. The dependent variable is represented by Y_{it} which is ROA of the banks. On the

other hand, $LLPTA_{it}$ represents loan loss provision to total assets which is a proxy of banks' credit risk, $NLTA_{it}$ represents net loans to total assets which is a proxy of banks' capability in meeting financial debt, $TOTA_{it}$ represents total overhead to total assets which is a proxy of bank's operating cost, SER_{it} represents shareholders equity ratio which is a proxy of the amount shareholders would receive in the event of company liquidation, BS_{it} represents bank size which is a proxy of the banks' total assets, GDP_{it} represents gross domestic products and INF_{it} represents inflation. Abduh and Alias (2014) claimed that POLS model provides the most accurate and reliable estimate possible of scores on the explanatory variables.

$$Y_{it} = c + \sum \beta_{it}X_{it} + \sum \gamma_{it}Z_{it} + \alpha_i DB_i + \varepsilon_{it}$$

Furthermore, POLS model was applied by Noman (2015) to investigate the effect of bank specific and macroeconomic factors on the profitability of Islamic bank in Bangladesh from year 2003 to 2013. Equation above was developed by Noman (2015) where subscript i and t indicates individual banks and time period respectively. Y_{it} indicates the dependent variable which represents profitability, while the independent variable X_{it} indicates the vector of bank specific variables, Z_{it} indicates the vector of macroeconomic variables and DB_i indicates dummy for Basel II implementation and ε_{it} indicates the disturbance term that shows the effect of all other variables apart from the impact of independent variable on the dependent variable that used in the function.

2.2.3 Fixed Effect Model (FEM)

Fixed Effect Model (FEM) assumes unobserved bank specific effects that are not involved in the regression are correlated with the regressors (Noman, 2015). Fixed effects estimation is assumed to have different intercept and slopes and no time effect. It allows the number of cross section to be smaller than parameter (Abduh and Idrees, 2013). It is a common method that used to study the determinants of bank performance as it take into account the differences between banks and allow the determination of the direction of error and thus minimize the risk of heterogeneity bias (Wu, Chen and Shiu, 2007). Previous researchers that employed FEM include Abduh and Idrees (2013), Ariffin and Tafri (2014), Lee and Kim (2013), Obamuyi (2013), Sufian and Chong (2008), as well as Wu et al. (2007).

$$ROAA_{i,t} = \alpha + \beta_1 X_{i,t} + \beta_2 X_t + \beta_3 M_t + \varepsilon_{i,t}$$

The equation above is developed by Abduh and Idrees (2013) in their research. The dependent variable is represented by $ROAA_{i,t}$ (return on average assets). On the other side, α represents a constant, $X_{i,t}$, X_t and M_t represents bank-specific factors, industry-specific factors and macroeconomic factors in year t respectively, $\varepsilon_{i,t}$ represents the error term, and $\beta_1, \beta_2, \beta_3$ represent regression coefficients.

$$ROA_{it} = \alpha + \sum_{k=1}^k \beta_k Y_{it}^k + \varepsilon_{it}$$

$$\varepsilon_{it} = v_i + u_{it}$$

Moreover, Obamuyi (2013) also applied FEM to investigate the factors influencing the profitability of twenty Nigeria banks from the year of 2006 to 2012. The equation above was developed by Obamuyi (2013) where

ROA_{it} is the return on asset that implies the profitability of bank i at time t , α is a constant term, Y_{it} is a vector of k independent variables while ε_{it} is the disturbance term with v_i the unobserved bank-specific effect and u_{it} the idiosyncratic error.

$$Y_{jt} = \delta_j + \alpha'X_{ijt} + \beta'X_{et} + \varepsilon_{jt}$$

Furthermore, Sufian and Chong (2008) also employed FEM to study the relationship between macroeconomic and bank specific determinants with the profitability of bank in Philippines for the period of 1990 to 2005. The equation above is developed where j is an individual banks, t is year, y_{jt} is ROA of bank j in year t , X_i and X_e are the internal factors as well as external factors of a bank respectively, and ε_{jt} is a normally distributed random variable disturbance term.

2.2.4 Random Effect Model (REM)

Random Effect Model (REM) is used to estimate a high variability data set to obtain a more accurate result (Francis, 2013). The effects of unobserved bank specific variables are assumed to be uncorrelated with the regressors although the effects are not involved in the regression. REM is a common model used to investigate the determinant of bank profitability. REM had been adopted by Francis (2013), Muda et al. (2013) as well as Sufian and Parman (2009),

Sufian and Parman (2009) used REM to study the factors affecting the profitability of NCBFIs in Malaysia. The constructed REM was shown as below:

$$\pi_{jt} = f \left(\beta_0 + \beta_1 \Sigma NCBFI_{characteristics_{jt}} + \beta_2 \Sigma Economic_{conditions_t} + \beta_3 \Sigma Specialization_{jt} \right) + \varepsilon_{jt}, \quad \varepsilon_{it} = v_i + u_{it}$$

Where Π_{jt} represents return on assets (ROA), $\Sigma NCBFI_{characteristics_{jt}}$ represents specific determinants of non-commercial bank financial institution's (NCBFI), $\Sigma Economic_{conditions_t}$ represents macroeconomic determinants, and $\Sigma Specialization_{jt}$ represents specialization.

Francis (2013) employed REM to study the variables affecting the earning of commercial bank in SSA from year 1999 to 2006. According to the findings, REM is able to generate a more efficient result in a high variability data set. The researcher claims that REM is an efficient estimator for unbalance panel models.

Muda et al. (2013) also applied REM model in their research in order to achieve their objective. The REM was constructed as below:

$$ROA = \alpha_0 + \beta_1 OHTA + \beta_2 LOTA + \beta_3 DTA + \beta_4 GDPGR + \beta_5 GDPPC + \beta_6 CONC + \beta_7 DDF + \varepsilon$$

Where ROA is return on asset, OHTA is overhead expenses over total assets, LOTA is loan over total assets, DTA is deposits over total assets, GDPGR is gross domestic product growth rate, GDPPC is gross domestic product per capita, CONC is concentration ratio and DDF is the difference between domestic and foreign bank.

2.2.5 White's Heteroskedasticity – Consistent Standard Error

The White's heteroskedasticity is used to identify the presence of heteroscedasticity problem in a model. According to Muda et al., (2013), Sufian and Chong (2008), Sufian and Parman (2009), White's heteroskedasticity can also be used to control the cross-sectional heteroscedasticity.

2.2.6 Unit Root Test

Unit Roots test by Augmented Dickey Fuller (ADF) is applicable for unbalanced panels to assess the stationary of the variables (Ariffin and Tafri, 2014). Ariffin and Tafri (2014) who studied the impact of financial risks on the profitability of Islamic banks had adopted ADF to test the stationary of the variables in the model. Besides, Francis (2013) also applied ADF test to prove the efficiency and appropriating of the key bank variables in evaluating bank profitability in SSA from year 1999 to 2006. Moreover, ADF test was also employed by Apergis (2014) to examine the order of integration for each variable in determining the duty of non-traditional banking in profitability and long-term risk profiles in US banking institutions.

2.2.7 Feasible Generalised Least Square (FGLS)

Feasible Generalised Least Square (FGLS) was employed in the research conducted by Francis (2013). FGLS shows the result of bank profitability (ROAA), Net Interest Margin (NIM) and Return on Average Equity (ROAE) as the dependent variables. FGLS is used to investigate the accuracy of REM and to prove the consistency and efficiency of the results.

2.2.8 Breush-Pagan Lagrange Multiplier (LM) Test

Breush-Pagan Lagrange Multiplier (LM) test is used to estimate which model is appropriate and discriminate between the pool model and REM. Muda et al. (2013) and Noman (2015) used Breush-Pagan LM test to decide whether the POLS model or REM is suitable for the research. Besides, LM test also provides a standard means of testing parametric restrictions for a variety of models.

2.2.9 Generalized Least Square (GLS) Test

Generalized least square (GLS) test is an OLS estimator of a transformed generalized least square model. Ariffin and Tafri (2014) employed GLS method because the data in the research is not normally distributed. Besides, OLS estimator cannot be guaranteed to be the most efficient among the class of linear unbiased estimators when the elements of Y do not equal to the variance and $\text{var}(y)$ is no longer a scalar variance-covariance matrix. Therefore, GLS test is employed to solve these kinds of problems to enhance the efficiency of estimation.

2.3 Review of Theoretical Model

2.3.1 Theory of Economies of Scales

Theory of economies of scales indicates the cost advantage that appears when the output of a product increases. It states that large institutions may enhance their profit as they have a better diversification and a wider range of financial instruments. Furthermore, the firm can produce goods and services besides process and gather information more efficiently at a lower cost. The theory also implies that larger firms are more profitable as they increase the returns by distributing the fixed costs over a larger volume of services or form efficiency gains from a particular workforce.

2.3.2 Theory of Diseconomies of Scale

The theory of diseconomies of scale arises when the size exhibit an inverse effect on the institutional profitability. The theory claims that the effect of economies of scale may only functioned up to a specific point. Beyond the limit, the institutions will face higher risk and incur more administrative overheads, agency problems, management of complexity and other cost factor that will cause a negative impact to the bank profitability instead of experiencing continued reducing costs per rising in output.

2.3.3 Signalling Theory

Signalling theory states that the value of an institution will be affected by the institution's capital. Hence, higher capital is a positive signal to the institution value. The theory also indicates that well-capitalised institution will perform better as they have lower leverage. The theory is consistent with the research findings from Smaoui and Salah (2012), Obamuyi (2013), as well as Samhan and Khatib (2015).

2.3.4 Agency Theory

Agency theory claims that lower capital will reduce the agency costs and hence increase the profitability of the institutions. Besides, the theory indicates that institutions with lower capitalization ratio tend to have higher profits, which is consistent with the research findings from Wasiuzzaman and Tarmizi (2010) as well as Noman (2015).

2.3.5 Fisher Effect

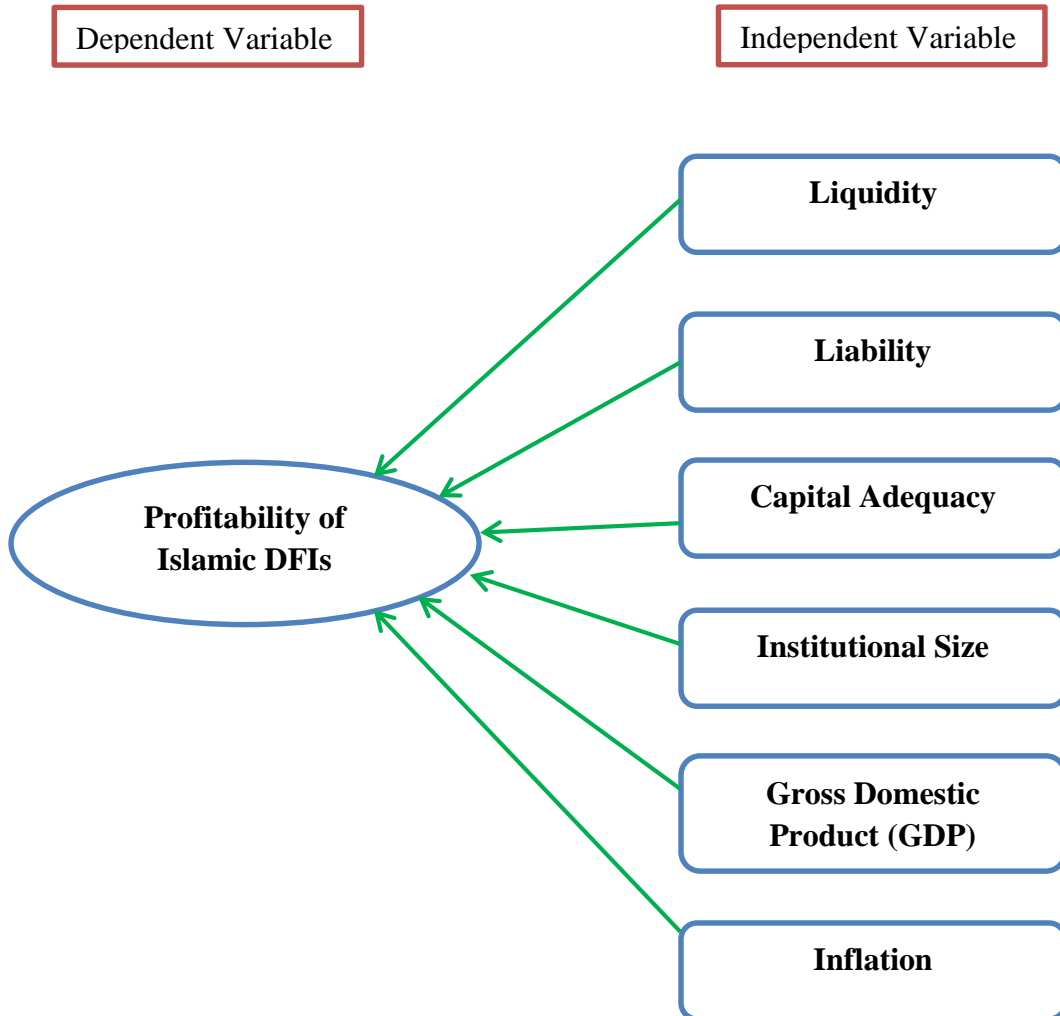
Fisher effect is used to investigate the relationship between both real and nominal interest rates with inflation. The theory suggests that real interest rate is derived by minus out the expected inflation rate from the nominal interest rates. Thus, real interest rates will decline when inflation rises, by holding the nominal interest rate constant.

2.3.6 Bankruptcy Cost hypothesis

Bankruptcy cost hypothesis explains that well-capitalised institutions can avoid the bankruptcy cost (Obamuyi, 2013). Hence, the theory claims that there is a direct relationship between capital and institutional profitability.

2.4 Proposed Conceptual Framework

Figure 2.0: Dependent and independent variables in this study



Institutional-specific variables, including liquidity, liability, capital adequacy, and institutional size as well as macroeconomic variables, including GDP and inflation are being employed as independent variables to investigate the factors influence the profitability of Islamic DFIs in Malaysia.

2.5 Hypothesis Development

2.5.1 Liquidity

H_0 : The relationship between liquidity and profitability of Islamic DFIs in Malaysia is insignificant

H_1 : The relationship between liquidity and profitability of Islamic DFIs in Malaysia is significant

The significance of correlation between liquidity and profitability of Islamic DFIs in Malaysia will be determined. Rejecting null hypothesis indicates that the relationship between the variables is significant (Sayedi, 2014).

2.5.2 Liability

H_0 : The relationship between liability and profitability of Islamic DFIs in Malaysia is insignificant

H_1 : The relationship between liability and profitability of Islamic DFIs in Malaysia is significant

The significance of correlation between the liability and profitability of Islamic DFIs in Malaysia will be determined. Rejecting null hypothesis indicates that the relationship between the variables is significant (Amba and Almkharreq, 2013).

2.5.3 Capital Adequacy

H_0 : The relationship between capital adequacy and profitability of Islamic DFIs in Malaysia is insignificant

H_1 : The relationship between capital adequacy and profitability of Islamic DFIs in Malaysia is significant

The significance of correlation between the capital adequacy and profitability of Islamic DFIs in Malaysia will be determined. Rejecting null hypothesis indicates that the relationship between the variables is significant (Samhan and Khatib, 2015).

2.5.4 Institutional Size

H_0 : The relationship between institutional size and profitability of Islamic DFIs in Malaysia is insignificant

H_1 : The relationship between institutional size and profitability of Islamic DFIs in Malaysia is significant

The significance of correlation between the institutional size and profitability of Islamic DFIs in Malaysia will be determined. Rejecting null hypothesis indicates that the relationship between the variables is significant (Abdul and Alias, 2014).

2.5.5 Gross Domestic Product (GDP)

H₀: The relationship between GDP and profitability of Islamic DFIs in Malaysia is insignificant

H₁: The relationship between GDP and profitability of Islamic DFIs in Malaysia is significant

The significance of correlation between the GDP and profitability of Islamic DFIs in Malaysia will be determined. Rejecting null hypothesis indicates that the relationship between the variables is significant (Al-Kayed et al., 2014).

2.5.6 Inflation

H₀: The relationship between inflation and profitability of Islamic DFIs in Malaysia is insignificant

H₁: The relationship between inflation and profitability of Islamic DFIs in Malaysia is significant

The significance of correlation between the inflation and profitability of Islamic DFIs in Malaysia will be determined. Rejecting null hypothesis indicates that the relationship between the variables is significant (Wasiuzzaman and Tarmizi, 2010).

2.6 Conclusion

Generally, this research is to examine the relationship between institutional-specific variables (liquidity, liability, capital adequacy, and institutional size) and macroeconomic variables (GDP and inflation) with the profitability (ROA) of Islamic DFIs in Malaysia. This chapter reviews the related studies conducted by previous researchers in explaining the relationship and significance of each independent variable on the profitability of financial institutions. In addition, literature review on the measurements to evaluate the performance of the financial institutions is conducted. This chapter also reviews the theoretical framework and theoretical model that applied and discussed by previous researchers. Lastly, this chapter includes the proposed conceptual framework in section 2.4 and hypothesis development in section 2.5.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter discusses the data collection method and methodology that being employed in conducting this research. Besides, research design and data analysis are also included in this chapter.

3.1 Research Design

This research is conducted to examine the correlation between dependent variable (ROA) of Islamic Development Financial Institutions (DFIs) with each of the independent variables that includes institutional-specific variables (liquidity, liability, capital adequacy and institutional size) and macroeconomic variables (gross domestic product (GDP) and inflation). This research employs secondary data which obtained from Worldbank database and financial annual reports of Agrobank, Bank Rakyat, Small and Medium Enterprises (SME) Bank, Bank Pembangunan Malaysia Berhad (BPMB), Bank Simpanan Nasional (BSN) as well as Lembaga Tabung Haji. Besides, quantitative data of dependent variable and independent variable that expressed in numerical form such as percentage, ratio and in log form is used in this research to analyze the profitability of Islamic DFIs in Malaysia. Panel data regression model is applied by using mathematical methods and statistical techniques.

3.2 Data Collection Method

Secondary data is used in this research and the data is measured on annual basis. The data was collected mainly from financial annual report of each Islamic DFIs and World Bank Database. The time period covers from the year of 2009 to 2014. There are 36 observations in this research which involved time periods of 6 years with 6 different Islamic DFIs, including Agrobank, Bank Rakyat, BSN, Lembaga Tabung Haji, BPMB and SME Bank in Malaysia. The financial ratios are used as measurement to measure the liquidity, liability, capital adequacy and institutions size of each of the Islamic DFIs. Meanwhile, gross domestic product (GDP) and inflation are measured in percentage forms (%).

3.2.1 Profitability of Islamic DFIs

Return on assets (ROA) is used as a proxy to represent the profitability of Islamic DFIs in Malaysia. ROA measures the efficiency of the bank management in converting the bank assets into profits. The formula of ROA ratio is measured by dividing the net income of bank with total asset (Wasiuzzaman and Tarmizi, 2010). The data is denominated in millions(s) of Ringgit Malaysia. This quantitative data is expressed in ratio form. The annual data is collected from annual reports of each Islamic DFIs from year 2009 to 2014.

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

3.2.2 Liquidity

Loan over total asset ratio is employed to measure the liquidity of each Islamic DFIs in Malaysia. The ratio measures the total assets that have been invested in the loan portfolio. The ratio is computed by using the formula of total loans over total assets (Muda, Shaharuddin, and Embaya, 2013). The annual data of loan to total asset is obtained from the annual report of each Islamic DFIs from year 2009 to 2014. The data is denominated in ratio form.

$$\text{Loan to total asset ratio} = \frac{\text{Loan}}{\text{Total asset}}$$

3.2.3 Liability

Deposits to asset ratio is used as a proxy to represent the liability of Islamic DFIs in Malaysia. It measures the ratio of income source and liquidity of the bank asset that tied to loans. The ratio is obtained by using total deposit divided by total asset (Abusharba, Triyuwono, Ismail and Rahman, 2013). The data is collected from the financial annual reports of each Islamic DFIs that covers the period from year 2009 to 2014. The unit of measurement is in ratio form.

$$\text{Deposit to total asset ratio} = \frac{\text{Deposit}}{\text{Total asset}}$$

3.2.4 Capital Adequacy

Equity to asset ratio is used as a proxy to represent the liability of Islamic DFIs in Malaysia. It measures the total amount of assets which is financed by the shareholders' investment. The ratio is computed by using the total equity divided by total asset (Samhan and Khatib, 2015). The data is obtained from the annual report of each Islamic DFIs for the year of 2009 to 2014. The unit of measurement is in ratio form.

$$\text{Equity to total asset ratio} = \frac{\text{Equity}}{\text{Total asset}}$$

3.2.5 Institutional Size

Institutional size is measured by logarithm 10 of total asset (Samhan and Khatib, 2015). The data of total assets is collected from the annual reports that covered each of the Islamic DFIs from the period of 2009 to 2014. The data is denominated in logarithms form.

$$\text{Institutional size} = \log_{10} \text{Asset}$$

3.2.6 Gross Domestic Product (GDP)

According to Samhan and Khatib (2015), GDP is applied as a proxy to indicate the nation overall economic activities. This is a quantitative data and the unit of measurement is in percentage form (%). The data is obtained from World Bank Data in annual basis which covered the period from year 2009 to 2014.

3.2.7 Inflation

Wasiuzzaman and Gunasegavan (2013) indicate that inflation is measured by percentage change in the consumer price index (CPI) in annual basis. CPI measures the rate of increase in prices of the general goods and services and purchasing power of the consumers. The data is obtained from World Bank Data from the period of 2009 to 2014. The unit of measurement is in percentage form (%).

3.3 Data Analysis

3.3.1 Panel Data

Panel Data is the pooled of time series and cross-sectional data. Panel data reveals more information because it has greater time dimensions and spaces. Moreover, panel data provides more informative data, more variability due to greater time dimensions, more degree of freedom, less error and efficiency, as well as less multicollinearity between independent variables besides enable the increasing of independent variables. Furthermore, panel data is able to detect and examine the effects that cannot be observed by pure cross-sectional and pure time series data.

3.3.2 Descriptive Analysis

According to Dawood (2014), descriptive analysis is employed to summarise the data of all the variables in a research. The summary of these data are shown in the measurement of mean, minimum, maximum and standard deviation in order to have a better summarization of the information obtained.

3.3.3 Unit Root Test

Unit root test is important because it can be applied to test the stationary of the data to avoid the problem of biased result. Besides, the test can ensure a greater accuracy on the result of the testing trends. In this research, Phillips-Perron (PP) test is used for panel data.

3.3.3.1 Phillips-Perron (PP) Test

Phillips-Perron (PP) Test is conducted to examine the level of stationary in the model where the model is derived from the Augmented Dickey Fuller (ADF) model at which it excludes the lags of dependent variables.

Phillips-Perron (PP) model:

$$\Delta Y_t = \alpha + \pi_{2xt-1} + \phi \left(t - \frac{T}{2} \right) + \sum_{i=1}^m \phi_i \Delta Y_{t-1} + \varepsilon_{2t}$$

Hypothesis Statement:

H₀: All variables contain unit root problems and not stationary

H₁: All variables do not contain unit root problems and stationary

Decision rule:

Reject H₀ if p-value is lower than 1% significance level which reveals that the model is stationary. Otherwise, do not reject H₀ which shows that the model is not stationary at the significance level of 1%

3.3.4 Diagnostic Checking

Diagnostic checking will be run before Pooled Ordinary Least Square (OLS) test to detect the existence of major economic problems such as multicollinearity, heteroscedasticity, autocorrelation, normality, and model specification problem. If all of the problems detected are solved, the model can become the best, linear, and unbiased estimator (BLUE) result.

3.3.4.1 Multicollinearity

According to Allison (2012), multicollinearity problem is the situation when the independent variables in a model are correlated with others independent variables. It causes difficulties of regression model in telling which explanatory variables are influencing the dependent variable. Multicollinearity problem can be anticipated by using estimated model. Firstly, the R-square of estimated model is high and there are only a few of the independent variables or none of the independent variables are significantly correlated to the dependent variable. Next, multicollinearity problem may exist when the correlation between two independent variables is high pair-wise. Variance Inflation Factor (VIF) is one of the methods that used to test the existence of multicollinearity problem. It ignores the original dependent variable and uses all the independent variables to become dependent variable each a time to ensure that there is no violation against this particular assumption.

The table below shows the interpretation of VIF:

Table 3.1: Interpretation of Variance Inflation Factor (VIF)

VIF \geq 10	Serious multicollinearity problem
VIF < 10	No serious multicollinearity problem
VIF = 1	No multicollinearity problem
VIF = ∞	Perfect multicollinearity problem.

Source: Allison (2012)

Variance Inflation Factor (VIF):

$$VIF = \frac{1}{1 - R^2}$$

Where,

R^2 = Coefficient of determination (R-squared)

Hypothesis Statement:

H_0 : The model has no multicollinearity problem

H_1 : The model has multicollinearity problem

Decision rule:

Reject H_0 if VIF is more than 10 which indicates that the model has multicollinearity problem. Do not reject H_0 if VIF is less than 10 which shows that the model is free from multicollinearity problem.

3.3.4.2 Heteroscedasticity

Heteroscedasticity problem is the situation when the variance of error term is inconstant (Gujarati and Porter 2009) which implies that the variance of error term is different across the observations. Heteroscedasticity problem occurs due to human behaviours, outliers of data and incorrectly specified of the regression model. Heteroscedasticity problem can be detected by using White test which was proposed by Halbert White (1980).

Test Statistic:

$$Test\ statistic = nR^2$$

Where,

n = Number of observations

R^2 = Coefficient of determination (R-square)

Hypothesis Statement:

H_0 : The model has no heteroscedasticity problem

H_1 : The model has heteroscedasticity problem

Decision rule:

Reject H_0 if p-value is lower than 1% significance level which shows that the model has heteroscedasticity problem. Otherwise, do not reject H_0 which shows that the model has no heteroscedasticity problem at 1% significance level.

3.3.4.3 Autocorrelation

Autocorrelation problem happens in time series data when there is correlation between the t period and the error terms of the past period. In other word, when the data is arranged time by time, the error of one period will affect the error of next period (Gujarati and Porter 2009). Moreover, the autocorrelation problem occurs in the cross-sectional data when error terms are correlated with each other in term of social and geographical distance (Heteroscedasticity and Autocorrelation, 2008). Therefore, Breusch-Godfrey Serial Correlation Lagrange Multiplier (LM) test is carried out to detect the autocorrelation problem.

Test Statistic:

$$\text{Test statistic} = (n - p)R^2$$

Where,

n = Number of observations

p = Fitted lagged lane

R^2 = Coefficient of determination (R-squared)

Hypothesis Statement:

H_0 : The model has no autocorrelation problem

H_1 : The model has autocorrelation problem

Decision rule:

Reject H_0 if p-value is lower than 1% significance level which shows that the model has autocorrelation problem. Otherwise, do not reject H_0 which shows that the model has no autocorrelation problem at 1% significance level.

3.3.4.4 Normality Assumption

Classical Linear Regression Model (CLRM) assumes that the error term from different model cannot be correlated and should be normally distributed. Jarque-Bera Test is a formal way to examine whether the error term is normally distributed or not. The normality and independently distribution of error term is important in the normality assumption in ensuring the normality of the parameters. Jarque-Bera Test statistic is measured by using the skewness and kurtosis as shown in below (Gujarati and Potter, 2009).

Test Statistic:

$$JB = n \left[\frac{S^2}{6} + \frac{(K - 3)^2}{24} \right]$$

Where,

n = Number of observations

S = Skewness

K = Kurtosis

Hypothesis Statement:

H₀: The error terms are normally distributed

H₁: The error terms are not normally distributed

Decision rule:

Reject H₀ if p-value is lower than 1% significance level which shows that the error terms are not normally distributed. Otherwise, do not reject H₀ which shows that the error terms are normally distributed at 1% significance level.

3.3.4.5 Model Specification Error Test

Ramsey's RESET Test is employed to determine whether the functional form of a model is correctly specified or not. When the model is correctly specified, the least square estimated parameters are consistent with true parameter. OLS estimators can be biased due to specification errors such as omitting important variables, using wrong functional form, including irrelevant variables and measurement error. Therefore, Ramsey's RESET test is carried out to detect the model specification problem.

Ramsey's RESET Test:

$$F = \frac{(R_{unrestricted}^2 - R_{restricted}^2)/(k_{unrestricted} - k_{restricted})}{(1 - R_{unrestricted}^2)/(n - k_{unrestricted})}$$

Where,

R^2 = Coefficient of determination (R-squared)

k = Number of explanatory variables

n = Number of observations

Hypothesis Statement:

H_0 : The model is correctly specified

H_1 : The model is not correctly specified

Decision rule:

Reject H_0 if p-value is lower than 1% significance level which shows that the model is not correctly specified. Otherwise, do not reject H_0 which shows that the model is correctly specified at 1% significance level.

3.3.5 Redundant Fixed Effect Likelihood Ratio

Redundant Fixed Effect likelihood ratio is a statistical test to compare the fixed effect model to the model without the effect. The likelihood ratio explains how many times the data of one model is under than the other. It also shows the absence of unknown parameter. The null hypothesis (H_0) shows fixed effects estimation is inadequate. Furthermore, the likelihood ratio can be used to compute the p-value or used critical value to determine whether to reject the null hypothesis or not. The result of the likelihood ratio can be low or high. Low likelihood ratio means the observed result is less likely to occur under H_0 . Therefore, H_0 is rejected and Random Effect Model (REM) test will be used. However, high likelihood ratio means the observed result is likely to occur under H_0 . Thus, H_0 should not be rejected and Pooled Ordinary Least Square (POLS) model will be used.

3.3.6 Pooled Ordinary Least Square (POLLS) Model

The data of model has observations over time for several different units or cross-sections. The model assumes that the observations are constant over time, besides the error terms and independent variables are uncorrelated. However, in order to use POLS model, there are three assumptions have to be fulfilled. First, the intercepts must be constant across companies. Second, the slopes are constant across companies and lastly there must be no time effect (time invariant). Therefore, POLS model is used to conduct this research to examine the relationship between the profitability of Islamic DFIs in Malaysia with the institutional-specific variables and macroeconomic variables by assuming all the assumptions are fulfilled. According to Javaid, Anwar, Zaman and Gafoor (2011), POLS model is a valid method where variables can show a stable relationship across the developed financial institutions because the independent variables in the model will be more reliable.

3.3.7 Return on asset (ROA)

ROA is a type of financial ratio that used to evaluate the financial performance of a firm by considering the return over the total asset (Ofoeda et al., 2016). The model shows the performance of each Islamic DFIs from the year of 2009 to 2014. Islamic DFIs that have higher ROA is said to be perform better as they are able to manage assets effectively and efficiently and thus more revenue will be generated.

$$ROA = \frac{\text{Profit of the year}}{\text{Total asset}}$$

3.4 Conclusion

In conclusion, this chapter focuses on research methodology, research design, data collection method, and data analysis. In this research, EViews 7 software will be used to perform diagnostic checking, unit root test and POLS model to meet the objectives of the research. Moreover, ROA had been employed to determine the performance of each Islamic DFIs in Malaysia.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

This chapter will mainly focus on interpreting and analyzing the identified statistical tests to comply with the research objective. The data is collected from Worldbank database and financial annual reports of Agrobank, Bank Rakyat, Small and Medium Enterprises (SME) Bank, Bank Pembangunan Malaysia Berhad (BPMB), Bank Simpanan Nasional (BSN) as well as Lembaga Tabung Haji. The diagnostic checking will be conducted to ensure the model is free from econometric problems. Besides, EViews 7 is employed to conduct the test analyses. 1% (0.01) of significance level is chosen in this research to enhance the precision and conservative of the result (Gujarati and Porter, 2009).

4.1 Descriptive Analysis

Table 4.1: Descriptive Statistics

	Mean	Medium	Maximum	Minimum	Std. Dev
ROA	0.014862	0.015040	0.043120	-0.011780	0.011369
Liquidity	0.537899	0.524727	0.838429	0.188233	0.183014
Liability	0.538634	0.500023	0.887974	0.199273	0.238793
Capital Adequacy	0.214743	0.167739	0.532870	0.059697	0.145625
Institutional Size	10.45268	10.47120	11.02953	9.815559	0.388734
GDP	4.564264	5.383620	7.425970	-1.513690	2.885000
Inflation	2.066118	1.907525	3.200000	0.583308	0.920351

Source: Developed for the research via EViews 7

Table 4.1 shows the summary of descriptive statistics for all the variables used in the research over the period of 2009 to 2014, which includes return on asset (ROA), liquidity (loan to asset), liability (deposit to asset), capital adequacy (equity to asset), institutional size (log of asset), gross domestic product (GDP) and inflation. The mean values imply the arithmetical average of the variables from year 2009 to 2014 based on the individual sample of Islamic DFIs. Meanwhile, the minimum and maximum values reflect the differences in the profitability among the Islamic DFIs.

4.2 Unit Root Test

Unit Root Test is used to examine the stationary of the model. The hypothesis and result are shown as below:

Hypothesis Statement:

H_0 : All variables contain unit root problem and not stationary

H_1 : All variables do not contain unit root problem and stationary

Decision rule:

Reject H_0 if p-value is lower than 1% significance level which reveals that the model is stationary. Otherwise, do not reject H_0 which shows that the model is not stationary at 1% significance level.

Table 4.2: Unit Root Test

Variables	Constant with trend
ROA	0.0202
Liquidity	0.0003
Liability	0.0000
Capital adequacy	0.0004
Institutional size	0.0017
GDP	0.0000
Inflation	0.0053

Source: Developed for the research via EViews 7

Note: Significance level at 1%

Decision:

Referring to table 4.2, reject H_0 since the p-values of all the variables are less than 1% significance level.

Conclusion:

There is enough evidence to conclude that all the variables do not contain unit root problem and they are stationary at 1% significance level.

4.3 Diagnostic Checking

4.3.1 Multicollinearity

Hypothesis Statement:

H_0 : The model has no multicollinearity problem

H_1 : The model has multicollinearity problem

Decision rule:

Reject H_0 if VIF is more than 10 which indicates the model has multicollinearity problem. Do not reject H_0 if VIF is less than 10 which shows that the model is free from multicollinearity problem.

Table 4.3: Variance Inflation Factor (VIF) Test

Dependent variable	Variance inflation factor (VIF) $VIF = \frac{1}{(1 - R^2)}$
Liquidity	3.3827
Liability	4.7516
Capital Adequacy	9.0060
Institutional Size	4.0863
GDP	1.7385
Inflation	1.7468

Source: Developed for the research via EViews 7

Note: Significance level at 1%

Decision:

Referring to table 4.3, do not reject H_0 since the result shows that all of the VIF values fall in the range of less than 10.

Conclusion:

There is enough evidence to conclude that the model has no multicollinearity problem.

4.3.2 Heteroscedasticity Problem (White Test)

White test is used to investigate the problem of Heteroscedasticity as the test does not depend on the normality assumption and it is readily generalized for the multiple regressions case with several regressors.

Hypothesis Statement:

H_0 : The model has no heteroscedasticity problem

H_1 : The model has heteroscedasticity problem

Decision rule:

Reject H_0 if p-value is lower than 1% significance level which shows that the model has heteroscedasticity problem. Otherwise, do not reject H_0 which shows that the model has no heteroscedasticity problem at 1% significance level.

Table 4.4: White Test

F-statistic	0.787181	Prob. F (27,8)	0.7006
Obs* R-squared	26.15515	Prob. Chi-square(27)	0.5100

Source: Developed for the research via EViews 7

Note: Significance level at 1%

Decision:

Referring to table 4.4, do not reject H_0 since the probability value (0.5100) obtained is higher than 1% significance level.

Conclusion:

There is enough evidence to conclude that the model has no heteroscedasticity problem model at 1% significance level.

4.3.3 Autocorrelation Problem (Breusch-Godfrey Serial Correlation LM Test)

Based on the diagnostic checking for Autocorrelation problem, Breusch-Godfrey LM Test is carried out to investigate the autocorrelation problem in the model. The lag length for autocorrelation is 2.

Hypothesis Statement:

H_0 : The model has no autocorrelation problem

H_1 : The model has autocorrelation problem

Decision rule:

Reject H_0 if p-value is lower than 1% significance level which shows that the model has autocorrelation problem. Otherwise, do not reject H_0 which shows that the model has no autocorrelation problem at 1% significance level.

Table 4.5: Breusch-Godfrey LM Test

Types of test	Test statistic value
Breusch-Godfrey LM test	Prob. Chi- Square (2) = 0.2119

Source: Developed for the research via EViews 7

Note: Significance level at 1%

Decision:

Referring to table 4.5, do not reject H_0 since the probability value (0.2119) obtained is higher than 1% significance level.

Conclusion:

There is enough evidence to conclude that the model has no autocorrelation problem at 1% significance level.

4.3.4 Normality test

Hypothesis Statement:

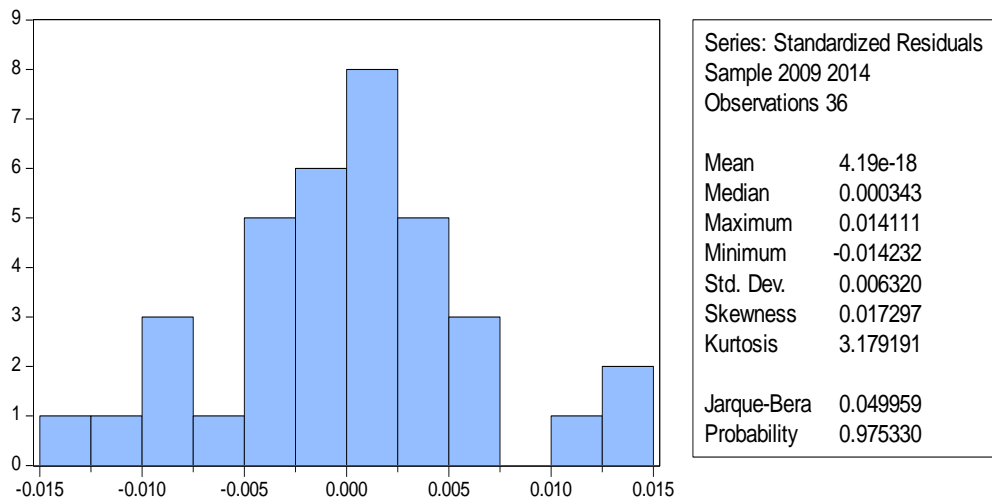
H_0 : The error terms are normally distributed

H_1 : The error terms are not normally distributed

Decision rule:

Reject H_0 if p-value is lower than 1% significance level which shows that the error terms are not normally distributed. Otherwise, do not reject H_0 which shows that the error terms are normally distributed at 1% significance level.

Graph 4.1: Jarque-Bera Test



Source: Developed for the research via EViews 7

Note: Significance level at 1%

Decision:

Referring to graph 4.1, do not reject H_0 since the probability value (0.9753) obtained is higher than 1% significance level.

Conclusion:

There is enough evidence to conclude that the error terms are normally distributed at 1% significance level.

4.3.5 Model Specification (Ramsey-RESET Test)

Hypothesis Statement:

H_0 : The model is correctly specified

H_1 : The model is not correctly specified

Decision rule:

Reject H_0 if p-value is lower than 1% significance level which shows that the model is not correctly specified. Otherwise, do not reject H_0 which shows that the model is correctly specified at 1% significant level.

Table 4.6: Ramsey RESET Test

F-statistic	0.214328	Prob. F (1,28)	0.6470
Log-likelihood ratio	0.274515	Prob.Chi-square (1)	0.6003

Source: Developed for the research via EViews 7

Note: Significance level at 1%

Decision:

Referring to table 4.6, do not reject H_0 since the probability value of F-statistic (0.6003) is higher than 1% significance level.

Conclusion:

There is enough evidence to conclude that the model is correctly specified at 1% significance level.

4.4 Redundant Fixed Effect Likelihood Ratio

Table 4.7: Redundant Fixed Effect Likelihood Test

Effect Test	Prob.
Cross-section F	0.1089

Source: Developed for the research via EViews 7

Note: Significance level at 1%

Hypothesis Statement:

H_0 : There is common intercept on all the Islamic DFIs (Pooled Ordinary Least Square (POLS) is better)

H_1 : There is no common intercept on all the Islamic DFIs (Fixed Effect Model (FEM) is better)

Decision rule:

Reject H_0 if p-value is lower than 1% significance level which indicates that there is common intercept on all the Islamic DFIs. Otherwise, do not reject H_0 which shows that there is no common intercept on all the Islamic DFIs at 1% significance level.

Decision:

Referring to table 4.7, do not reject H_0 since the probability value of F-statistic (0.1089) is higher than 1% significance level.

Conclusion:

There is enough evidence to conclude that there is common intercept between all the Islamic DFIs. Therefore, POLS model is better at 1% significance level.

4.5 Pooled OLS Model

$$ROA = 0.032692 + 0.007770 LOAN + 0.043556 DEPO + 0.095444 EQUI - 0.006465 SIZE + 0.000527 GDP - 0.000472 INF$$

Where,

ROA = Return on Asset

LOAN = Liquidity

DEPO = Liability

EQUI = Capital Adequacy

SIZE = Institutional Size

GDP = Gross domestic product

INF = Inflation

Table 4.8: Pooled OLS Model

Variable	Coefficient	Standard Error	T-Statistic	P-value
C	0.032692	0.051071	0.640124	0.5271
Liquidity	0.007770	0.011794	0.658795	0.5152
Liability	0.043556	0.010713	4.065718	0.0003
Capital Adequacy	0.095444	0.024847	3.841222	0.0006
Institutional Size	-0.006465	0.006199	-1.042990	0.3056
GDP	0.000527	0.000536	0.981680	0.3344
Inflation	-0.000472	0.001685	-0.280219	0.7813

Source: Developed for the research via EViews 7

Note: Significance level at 1%

4.5.1 Hypothesis Testing (T-test)

In this section, hypothesis testing was carried out to examine the relationship between dependent variable and independent variables. Besides, T-test is conducted to determine whether each of the independent variable is significant or insignificant to influence the dependent variable.

Table 4.9: Result of T-test

Independent Variables	P-value	Significance/Insignificance
Liquidity	0.5152	Insignificance
Liability	0.0003	Significance
Capital Adequacy	0.0006	Significance
Institutional Size	0.3056	Insignificance
GDP	0.3344	Insignificance
Inflation	0.7813	Insignificance

Source: Developed for the research via EViews 7

Note: Significance level at 1%

4.5.1.1 Liquidity (LOAN)

Hypothesis Statement

H_0 : The relationship between liquidity and profitability of Islamic DFIs in Malaysia is insignificant

H_1 : The relationship between liquidity and profitability of Islamic DFIs in Malaysia is significant

$\alpha = 0.01$

Decision rule:

Reject H_0 if the p-value of test statistic is lower than 1% significance level.

Otherwise, do not reject H_0 .

Decision:

Referring to table 4.9, do not reject H_0 since the p-value of test statistic (0.5152) is higher than 1% significance level.

Conclusion:

There is no enough evidence to conclude that the relationship between liquidity and profitability of Islamic DFIs in Malaysia is significant at 1% significance level.

4.5.1.2 Liability (DEPO)

Hypothesis Statement

H_0 : The relationship between liability and profitability of Islamic DFIs in Malaysia is insignificant

H_1 : The relationship between liability and profitability of Islamic DFIs in Malaysia is significant

$\alpha = 0.01$

Decision rules:

Reject H_0 if the p-value of test statistic is lower than 1% significance level. Otherwise, do not reject H_0 .

Decision:

Referring to table 4.9, reject H_0 since the p-value of test statistic (0.0003) is lower than 1% significance level.

Conclusion:

There is enough evidence to conclude that the relationship between liability and profitability of Islamic DFIs in Malaysia is significant at 1% significance level.

4.5.1.3 Capital Adequacy (EQU)

Hypothesis Statement

H_0 : The relationship between capital adequacy and profitability of Islamic DFIs in Malaysia is insignificant

H_1 : The relationship between capital adequacy and profitability of Islamic DFIs in Malaysia is significant

$\alpha = 0.01$

Decision rules:

Reject H_0 if the p-value of test statistic is lower than 1% significance level. Otherwise, do not reject H_0 .

Decision:

Referring to table 4.9, reject H_0 since the p-value of test statistic (0.0006) is lower than 1% significance level.

Conclusion:

There is enough evidence to conclude that the relationship between capital adequacy and profitability of Islamic DFIs in Malaysia is significant at 1% significance level.

4.5.1.4 Institutional Size (SIZE)

Hypothesis Statement

H_0 : The relationship between institutional size and profitability of Islamic DFIs in Malaysia is insignificant.

H_1 : The relationship between institutional size and profitability of Islamic DFIs in Malaysia is significant.

$\alpha = 0.01$

Decision rules:

Reject H_0 if the p-value of test statistic is lower than 1% significance level. Otherwise, do not reject H_0 .

Decision:

Referring to table 4.9, do not reject H_0 since the p-value of test statistic (0.3056) is higher than 1% significance level.

Conclusion:

There is no enough evidence to conclude that the relationship between institutional size and profitability of Islamic DFIs in Malaysia is significant at 1% significance level.

4.5.1.5 Gross Domestic Product (GDP)

Hypothesis Statement

H_0 : The relationship between GDP and profitability of Islamic DFIs in Malaysia is insignificant.

H_1 : The relationship between GDP and profitability of Islamic DFIs in Malaysia is significant.

$\alpha = 0.01$

Decision rules:

Reject H_0 if the p-value of test statistic is lower than 1% significance level. Otherwise, do not reject H_0 .

Decision:

Referring to table 4.9, do not reject H_0 since the p-value of test statistic (0.3344) is higher than 1% significance level.

Conclusion:

There is no enough evidence to conclude that the relationship between GDP and profitability of Islamic DFIs in Malaysia is significant at 1% significance level.

4.5.1.6 Inflation (INF)

Hypothesis Statement

H_0 : The relationship between inflation and profitability of Islamic DFIs in Malaysia is insignificant.

H_1 : The relationship between inflation and profitability of Islamic DFIs in Malaysia is significant.

$\alpha = 0.01$

Decision rules:

Reject H_0 if the p-value of test statistic is lower than 1% significance level. Otherwise, do not reject H_0 .

Decision:

Referring to table 4.9, do not reject H_0 since the p-value of test statistic (0.7813) is higher than 1% significance level.

Conclusion:

There is no enough evidence to conclude that the relationship between inflation and profitability of Islamic DFIs in Malaysia is significant at 1% significance level.

4.5.2 Overall Significance of Model (F-test)

Table 4.10: Result of F-statistic

Variable	Coefficient	Standard Error	T-Statistic	P-value
C	0.032692	0.051071	0.640124	0.5271
Liquidity	0.007770	0.011794	0.658795	0.5152
Liability	0.043556	0.010713	4.065718	0.0003
Capital Adequacy	0.095444	0.024847	3.841222	0.0006
Institutional Size	-0.006465	0.006199	-1.042990	0.3056
GDP	0.000527	0.000536	0.981680	0.3344
Inflation	-0.000472	0.001685	-0.280219	0.7813
R-square=0.691002				
P-value (F-statistic) =0.000003				

Source: Developed for the research via EViews 7

Note: Significance level at 1%

Hypothesis Statement

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$$

H_1 : At least one of the β_i is not equal to zero, where $i=1, 2, 3, 4, 5, 6$

Where:

β_1 = Liquidity

β_2 = Liability

β_3 = Capital Adequacy

β_4 = Institutional Size

β_5 = GDP

β_6 = Inflation

$$\alpha = 0.01$$

Decision rules:

Reject H_0 if the p-value of F-statistic is lower than 1% significance level.

Otherwise, do not reject H_0 .

$$\text{P-value (F-statistic)} = 0.000003$$

Decision:

Referring to table 4.10, reject H_0 since the p-value of test statistic (0.000003) is lower than 1% significance level.

Conclusion:

There is enough evidence to conclude that the model is significant at 1% of significance level.

4.6 Interpretation of R-square and Adjusted R-square

Table 4.11: Result of R-square and Adjusted R-square

R-square	0.691002
Adjusted R-square	0.627072

Source: Developed for the research via EViews 7

Based on the results obtained from EViews 7, there is approximately 69.10% of the variation in the profitability of Islamic DFIs in Malaysia can be explained by the variations in independent variables which are liquidity, liability, capital adequacy, institutional size, GDP and inflation. On the other hand, there is an approximately 62.71% of the variations in the profitability of Islamic DFIs in Malaysia can be explained by the variations in independent variables which are liquidity, liability, capital adequacy, institutional size, GDP and inflation after taking the degree of freedom into the account.

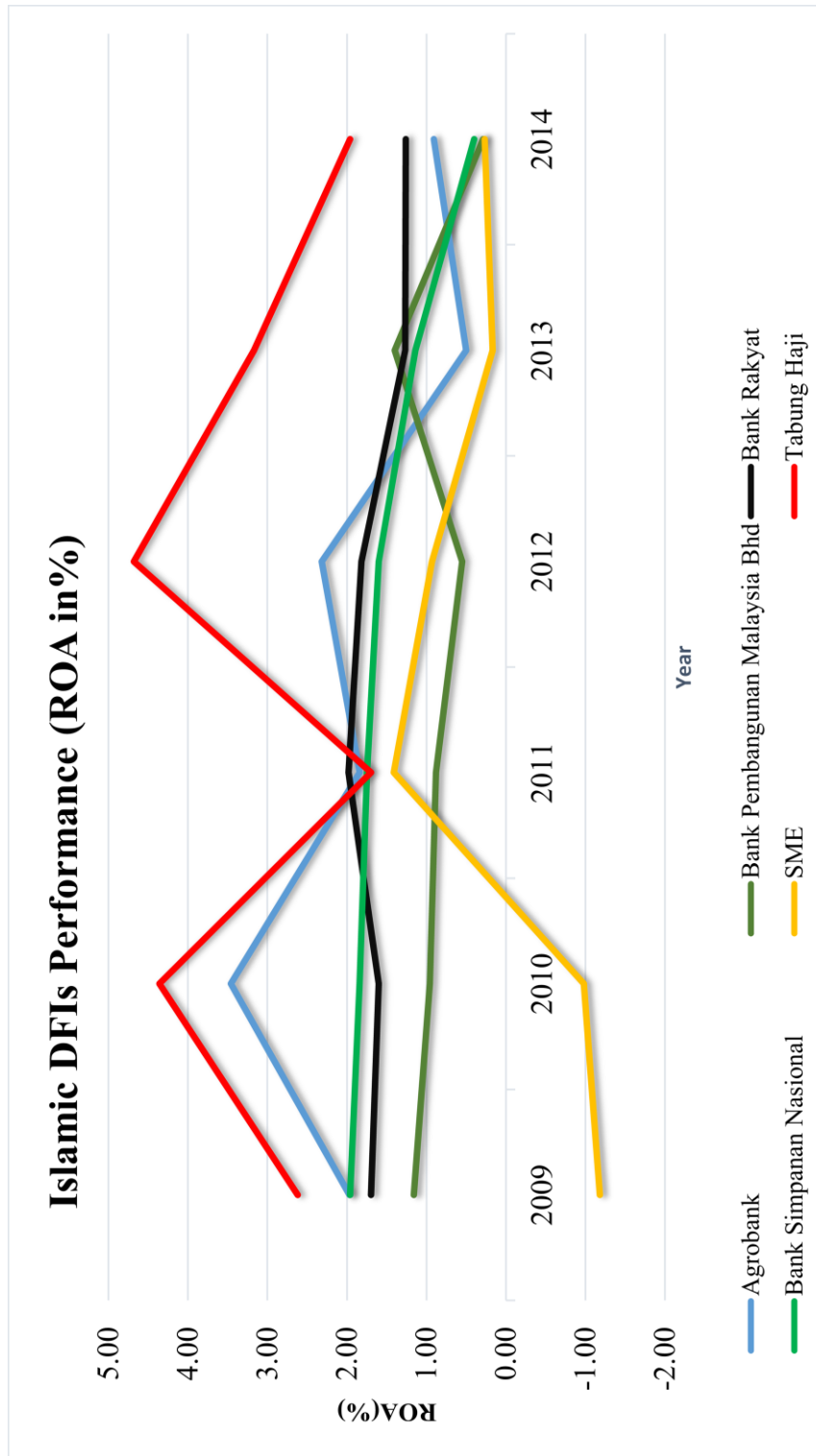
4.7 Performance of Islamic DFIs

Table 4.12: Result of ROA for each Islamic DFIs

Source: Developed for the research via Excel 2013

Year	Return on Asset (%)					
	Agrobank	Bank Pembangunan Malaysia Bhd	Bank Rakyat	Bank Simpanan Nasional	SME Bank	Tabung Haji
2009	1.97	1.16	1.70	1.96	-1.18	2.62
2010	3.46	0.96	1.60	1.84	-0.98	4.36
2011	1.84	0.88	1.98	1.75	1.41	1.70
2012	2.32	0.55	1.82	1.60	0.93	4.68
2013	0.50	1.40	1.27	1.14	0.17	3.17
2014	0.91	0.29	1.26	0.40	0.27	1.96

Graph 5.1: Islamic DFIs Performance



Source: Developed for the research via Excel 2013

The performance of Islamic DFIs in Malaysia can be measured by using ROA. The ROA result shows that Tabung Haji had the best performance among all the Islamic DFIs in Malaysia throughout the period except in year 2011. The result shown is consistence with the research conducted by Ofoeda, Gariba, and Amoah (2016) in which higher ROA indicates the firm performs better.

The highest ROA of Tabung Haji was 4.68% in year 2012 while the lowest ROA of Tabung Haji was 1.70% in year 2011. The average ROA of Tabung Haji was 3.08% from the year of 2009 to 2014. Besides, the performance of Tabung Haji was relatively stable throughout the period where the fluctuation of ROA is within the reasonable range.

On the other hand, SME Bank had the poorest performance among all the Islamic DFIs in Malaysia by evaluating on their ROA. SME Bank was the only Islamic DFI whereby their ROA was negative for two consecutive years. The ROA of SME bank was relatively volatile from year 2009 to 2014. During the year of 2010 to 2011, the ROA of SME Bank had changed for approximately 2%. The highest ROA of SME was only 1.41% in year 2011.

Apart from Tabung Haji and SME bank, other Islamic DFIs, including Agrobank, BPMB, Bank Rakyat, and BSN were performing averagely. Their ROA were relative stable and fluctuate within the range of 0.29% to 3.46%.

In short, Tabung Haji was the best performed Islamic DFI while SME Bank was the worst performed Islamic DFI among these six Islamic DFIs in Malaysia. Moreover, the performance of other Islamic DFIs including Agrobank, BPMB, Bank Rakyat and BSN were relatively stable.

4.8 Conclusion

In chapter 4, all tests were carried out by using EViews 7. These tests include descriptive statistic, unit root test, POLS and also diagnostic checking. From the unit root test, the result shows that all the variables are stationary and do not contain unit root at level stage with trend. Besides, the POLS result indicates that the liability and capital adequacy are the two independent variables that are significant to the dependent variable in the economic model. Moreover, the output of F-test also indicates that the economic model is significant. Last but not least, the results of diagnostic checking show that the model does not have multicollinearity, heteroscedasticity, autocorrelation problems and it is normally distributed as well as correctly specified. Apart from that, by using ROA, Tabung Haji is found to be the best performed Islamic DFI among the six Islamic DFIs in Malaysia.

CHAPTER 5: DISCUSSIONS, CONCLUSIONS AND IMPLICATIONS

5.0 Introduction

This chapter analyzes and presents previous statistical result. It also conducts the comparison of major finding between literature reviews and testing result in the previous chapter. Besides, implication of the study is also included in this section. Lastly, limitation and recommendation of the study is also discussed in this chapter for the future research purpose.

5.1 Summary of Statistical Analysis

Table 5.1: Summary descriptive statistics for all variables

<i>NxT</i>	<i>Mean</i>	<i>Medium</i>	<i>Maximum</i>	<i>Minimum</i>	<i>Std. Dev</i>
ROA	0.014862	0.015040	0.043120	-0.011780	0.011369
Loan	0.537899	0.524727	0.838429	0.188233	0.183014
Deposit	0.538634	0.500023	0.887974	0.199273	0.238793
Equity	0.214743	0.167739	0.532870	0.059697	0.145625
Log Asset	10.45268	10.47120	11.02953	9.815559	0.388734
GDP	4.564264	5.383620	7.425970	-1.513690	2.885000
INF	2.066118	1.907525	3.200000	0.583308	0.920351

Source: Developed for the research via EViews 7

Note: Significance level at 1%

Table 5.2: Result of Unit Root Test

<i>Phillip Peron Unit Root Test</i>	
Variables	Level (Constant with Trend)
Liquidity	Significant
Liability	Significant
Capital Adequacy	Significant
Institutional Size	Significant
GDP	Significant
Inflation	Significant

Source: Developed for the research via EViews 7

Note: Significance level at 1%

Table 5.3: Result of Diagnostic Checking

Diagnostic Checking	P-Value	Outcome
Multicollinearity	-	No Serious Multicollinearity Problem
Heteroscedasticity	0.5100	No Heteroscedasticity Problem
Autocorrelation	0.2119	No Autocorrelation Problem
Model Specification	0.6003	Model is Correctly Specified
Normality Test	0.9753	Normal Distributed

Source: Developed for the research via EViews 7

Note: Significance level at 1%

Table 5.4: Result of Statistical Analysis

Pooled OLS	P-Value	Outcome	Relationship
Liquidity	0.5152	Insignificant	Positive
Liability	0.0003	Significant	Positive
Capital Adequacy	0.0006	Significant	Positive
Institutional Size	0.3056	Insignificant	Negative
GDP	0.3344	Insignificant	Positive
Inflation	0.7813	Insignificant	Negative
Significance of Model (F-Test)	0.000003	Significant	-

Source: Developed for the research via EViews 7

Note: Significance level at 1%

The main objective of this research is to examine the relationship between the profitability of Islamic Development Financial Institutions (DFIs) with its determinants, including liquidity, liability, capital adequacy, institutional size, GDP and inflation. The data is regressed in Pooled Ordinary Least Square (POLs) model at the significance level of 1%.

Descriptive statistics are useful for describing the basic features of data. Whereby, in a research study with large data, these statistics may help us to manage the data and present it in a summary table. Table 5.1 showed the summary of descriptive statistics for all variables that used in the study. By looking into institutional size as one of the examples, the mean values of institutional size reflected the arithmetical average of the variables from year 2009 to 2014 based on the individual sample of Islamic DFIs. Besides, the medium value is the midpoint of the data set. Meanwhile, the minimum and maximum values are to reflect the differences in profitability among Islamic DFIs. Furthermore, the standard deviation value is to determine how spreads out the data are from the mean. Basically, a higher standard deviation indicates greater spread in the data.

Table 5.2 shows the results of unit root test. All the variables are found to be stationary at the level stages and the data for each variable is not affected by the recent trends. On the other hand, table 5.3 shows the results of diagnostic checking. The results indicate that none of the economic problem is existed in the model, which imply that the model is free from multicollinearity, heteroscedasticity, autocorrelation problems and the model is correctly specified as well as normally distributed.

Furthermore, table 5.4 highlighted the results of statistical analysis by using POLS model that conducted in chapter 4. The table shows that liability and capital adequacy are the two independent variables that are found to be significant at the significant level of 1%. Meanwhile, liquidity, institutional size, GDP and inflation are found to be insignificant. However, the overall model is significant as shown in the result of F-Test at the significance level of 1%. In addition, graph 4.2 shows that Tabung Haji is the best performed Islamic DFIs among others Islamic DFIs in Malaysia.

5.2 Discussion on Major Findings

Based on the statistical results, the profitability of Islamic DFIs is significantly affected by liability and capital adequacy while liquidity, institutional size, economic growth and inflation do not have significant impact on the profitability of Islamic DFIs.

5.2.1 Liquidity

The EViews test is conducted to examine the impact of liquidity on the profitability of Islamic DFIs in Malaysia. The result shows that the relationship between liquidity and the profitability of Islamic DFIs is positive and statistically insignificant, which is consistent with previous research conducted by Ariffin and Tafri (2014) as well as Sayedi (2014). Thus, liquidity cannot be viewed as an absolute determinant of Islamic DFIs (Ariffin and Tafri, 2014). Although higher liquidity indicates that Islamic DFIs are able to generate greater earnings when more loans are given out, it is insignificant because Islamic DFIs are specialised financial institutions that target into specific industries (Bank Negara Malaysia [BNM], 2016). Hence, the financing activities of each Islamic DFI are lower compare to other financial institutions as they are focusing in different industry.

5.2.2 Liability

The simple regression model to determine the relationship between liability and profitability of Islamic DFIs in Malaysia had been conducted. The output statistically proved that the relationship between the two variables is positive and significant, which is consistent with the research conducted by Gul, Irshad, and Zaman (2011), Muda, Shaharuddin, and Embaya (2013), as well as Owoputi, Kayode, and Adeyefa (2014). This relationship implies that when the deposits received by Islamic DFIs increase, their profitability will also increase. It is because Islamic DFIs rely heavily on deposits to attain greater return on assets (Gul et al., 2011). The growing amount of deposit liabilities can be transformed into loans and other profitable investment activities in order to achieve higher profit (Owoputi et al., 2014). In short, deposits of the institutions are viewed as the primary source of funding for Islamic DFIs and thus have a significant impact on the institution profitability.

5.2.3 Capital Adequacy

EViews output result proved that the capital adequacy is significantly and positively affects the profitability of Islamic DFIs in Malaysia. This result is aligned with previous research that conducted by Obamuyi (2013), Samhan and Khatib (2015) as well as Smaoui and Salah (2012). This positive relationship indicates that higher capitals of Islamic DFIs will increase their profitability. According to Obamuyi (2013), Islamic DFIs with higher capital are able to discover more investment opportunities, attract cheaper funds and assume higher risk. This could be explained by the signalling theory that claims that Islamic DFIs that have higher capital tend to have lower leverage. The positive relationship between capital and profitability is also supported by bankruptcy cost hypothesis (Obamuyi, 2013) which implies that higher capital can reduce the bankruptcy cost. According to Development Financial Institutions Act (DFIA) 2002, the regulatory capital requirement ensures the risk exposure of a financial institution is backed up by an adequate amount of liquid capital. Hence, Islamic DFIs are capable to withstand the risk arising from financial and economic crisis.

5.2.4 Institutional Size

The EViews output result shows that institutional size is insignificantly and negatively affects the profitability of Islamic DFIs. This output shown is conforming to the research conducted by Abduh and Alias (2014) and Almazari (2014). The negative relationship indicates that Islamic DFIs are not attaining the advantage of economies of scale, which could be explained by the theory of diseconomies of scale (Dawood, 2014). Theory of diseconomies of scale suggests that growing institutions may face diminishing marginal returns. Large institutions may face managerial inefficiencies and other cost factors that will lead to a negative impact on the bank profitability. On the other hand, smaller firms tend to grow faster during economic boom due to better consumer confidence and higher spending. However, the size-growth relationship is not stable over time but changes depend on the sector cycle and competitive environment of institutions, which can explain the insignificance of institution size to the profitability of Islamic DFIs (Hardwick and Adams, 2002).

5.2.5 Gross Domestic Product (GDP)

According to the EViews output result, the relationship between GDP and the profitability of the Islamic DFIs is positive but insignificant. The result is consistent with the previous researches such as Kiganda (2014) as well as Simiyu and Ngile (2015). The positive relationship between the variables implies that economic growth may enhance the profitability of Islamic DFIs. However, GDP is insignificant in explaining the profitability of Islamic DFIs which indicates that GDP, as an external factor is less likely will influence their profitability. According to Kiganda (2014), the profitability of Islamic DFIs is primarily determined by the decisions of internal management but not rely heavily on macroeconomic factors. This evidence is further supported as the managerial efficiency of a firm is essential in order to enable the Islamic DFIs to perform better.

5.2.6 Inflation

The statistically result of EViews shows that the correlation between inflation and profitability of Islamic DFIs is negative and statistically insignificant. This outcome is supported by Abduh and Alias (2014) as well as Kanwal and Nedeem (2013). The negative correlation between the variables reveals that inflation will lower the profitability of Islamic DFIs. Muda et al. (2013) stated that inflation will cause the operating expenses and wages to increase which lead to managerial inefficiency and thus lead to lower earning. The negative correlation between inflation and the profitability of Islamic DFIs is further supported by Fisher effects, which suggest that inflation will reduce the profitability of a firm. Nevertheless, inflation is insignificant toward the profitability of Islamic DFIs because central bank will adjust the lending rate according to the inflation rate (Kanwal and Nadeem, 2013). Therefore, inflation is not the major determinants in influencing the profitability of Islamic DFIs.

5.2.7 Performance of Islamic DFIs

As return on asset (ROA) is used to measure of the firm performance (Ofoeda, Gariba, and Amoah, 2016; Osorio, Colino, Martin, and Vicente, 2016; Vithessonthi and Racela, 2015), higher ROA indicates that the firm is performed better.

Among these six Islamic DFIs, Tabung Haji is the best performer because the ROA is the highest. The revenue and earning after tax of Tabung Haji are increasing steadily from 2009 to 2014. The revenue increased from RM 3.5 billion in 2009 to RM 8.2 billion, whereas the earning after tax increased from RM 1.4 billion in 2009 to approximately RM 4.6 billion in 2014. The steadily growth of revenue and earning after tax are due to the increasing number of depositors and the total amount of deposit. This increasing amount of deposit allows Tabung Haji to have more funds for investment and financing. However, according to Graph 5.1, the graph shows that the performance of Tabung Haji has upward and downward trend. The main reason of this fluctuation of trend is due to the changes in the fair value in securities available-for-sales (AFS) which will influence the comprehensive income and the ROA. The fair value in securities available-for-sales (AFS) in 2011 and 2014 are negative due to the declined market value of the securities.

Table 5.5: Changes in the fair value in securities available-for-sales (AFS) of Tabung Haji

Year	RM' million
2009	32
2010	769
2011	-863
2012	1800
2013	413
2014	-2400

Adapted from: Tabung Haji Annual Report from 2009 to 2014.

On the other hand, the performance of Small and Medium Enterprises (SME) bank is the worst among the six Islamic DFIs. SME bank faced losses for two consecutive years in 2009 and 2010. The main attribute for the losses is due to the allowance for impairment loss in financing which amounted RM 93 million in 2009 and RM 87 million in 2010 consecutively. Although revenue in 2009 is higher compared to 2010, the loss from discontinuing operation is approximately RM 64 million. Hence, these major losses had causes the SME bank face losses in these two years. The performance of SME bank improved in 2011 due to the increase in revenue and the writeback of impairment liability. The performance of bank during 2012 to 2014 were relatively stable as the revenues were approximately RM 130 million to RM 145 million.

Apart from that, the performance of Agrobank was relatively stable throughout the period from 2009 to 2014. There was no huge fluctuation of the performance of Agrobank. The highest ROA of Agrobank is 3.46% in 2010 which contributed by the higher net income (RM 786 million). Meanwhile, the lowest ROA of Agrobank is 0.50% in 2013 because the net comprehensive loss to be reclassified in subsequent period was high which amounted to RM 184 million.

Next, Bank Pembangunan Malaysia Berhad (BPMB) performed averagely for the period from 2009 to 2014. The ROA of BPMB range from 0.29% to 1.40 %. The huge fluctuation between year 2013 and 2014 mainly due to the revaluation of financial investment available-for-sale (AFS). In 2013, there was an unrealized gain on revaluation of financial investment approximately RM 51 million. In contradict, there was an unrealized loss on revaluation of financial investment approximately RM 82 million. The differences of the revaluation of financial investment between these two years had caused the performance of BPMP fluctuate during these period.

Besides that, the performance of Bank Rakyat is the most stable among six Islamic DFIs. The ROA of Bank Rakyat range from 1.26% to 1.98%. The operating income increase from RM 3.7 billion in 2009 to RM 5.98 billion. The rise in the amount of deposits and financing are the major factors towards the steadily growth of Bank Rakyat performance. Although Bank Rakyat has a higher total deposit from customer and other institutions, Bank Rakyat has to maintain a statutory reserve average RM 598 million for the period of 2009 to 2014 as stated under Bank Rakyat 2014 annual report. This statutory fund expenses will affect the Bank Rakyat ROA as well as their performance.

Lastly, the performance of Bank Simpanan Nasional (BSN) was relatively stable except 2014. BSN not performed well in 2014 was due to higher operating expenses which was approximately RM 1.3 billion compared to RM 1.1 billion in 2013. The revenue of BSN has steadily grow from RM 1.3 billion in 2009 to RM 2.3 billion in 2014.

In a nutshell, Tabung Haji is the best performed Islamic DFI while SME is the worst performed Islamic DFI among the 6 Islamic DFIs. Meanwhile, Agrobank, BPMB, Bank Rakyat, and BSN were performing relatively stable during the period of 2009 to 2014.

5.3 Implications of the Study

This research had been carried out to investigate the relationship between the profitability of Islamic DFIs in Malaysia with the determinants. The determinants of the Islamic DFIs consist of institutional specific factors (liquidity, liability, capital adequacy and institutional size) and macroeconomic factors (GDP and inflation). Besides, the performance of Islamic DFIs is evaluated in this research. Therefore, the result of this research is able to provide some useful information to institutional managers, government, academicians, and public investors in order to boost the economic growth.

5.3.1 Institutional Managers

This research enables the institutional managers to have a better understanding on the impact of each determinant on the profitability and performance of Islamic DFIs. Among institutional-specific determinants have been tested, liquidity, liability, and capital adequacy influence the profitability of Islamic DFIs positively. Higher liquidity indicates that Islamic DFIs perform better when they offer greater amount of loan to the customers. Whereas, a higher liability indicates that Islamic DFIs are able to obtain more deposits from customers, and hence they have more funds to make investment or loan. Meanwhile, higher capital adequacy reveals that the higher amount of retained capital can ensure the well-capitalized of the institutions. Therefore, institutional managers should focus on these aspects in order to improve the profitability and performance of the institutions. Next, institutional managers have to consider the institutional size because inappropriate institutional size will cause an adverse impact on the profitability of Islamic DFIs. By focusing on the institutional-specific factors, Islamic DFIs are able to improve the overall performance and ensure their sustainability.

5.3.2 Government

This research will contribute some useful information to the government policymakers. Since inflation can affect the profitability of Islamic DFIs negatively, policymakers have to ensure that inflation rate in the country is in optimal level to ensure the profitability of Islamic DFIs will not be heavily affected by inflation. Besides, the policymakers have to ensure that the policies implemented are favourable to the profitability and performance of the Islamic DFIs because Islamic DFIs play an essential role in promoting economic growth through the developing of targeted strategic sectors in Malaysia. Moreover, policymakers have to review the capital requirement of Islamic DFIs regularly to ensure they have retained adequate amount of capital in order to reduce bankruptcy risk and thus promote the economic growth.

5.3.3 Academicians

This research is useful for academicians by adding to the existing literature to investigate the profitability and performance of Islamic DFIs in Malaysia. The outcomes of this research may shed some light on the determinants and the performance of Islamic DFIs and generate some new ideas for future academicians who are interested to conduct researches related to Islamic DFIs. Future researcher may use this research as a guideline to extend further study on the topics related to Islamic DFIs, including extending the variables affecting the profitability of Islamic DFIs, the loan financing strategy focused by Islamic DFIs as well as awareness of Islamic DFIs among citizens in Malaysia.

5.3.4 Public Investors

This research is also useful to public investors. Public investors are able to get a better insight on the performance of Islamic DFIs by evaluating the performance of each Islamic DFIs. The results of this research can create awareness among the public investors to encourage them to study the trend and predict the future potential of Islamic DFIs. Investment of Islamic DFIs contains lesser risk compared to the conventional bank investment as Islamic DFIs can be funded at lower costs and the institutions are backed by strong shareholder support from government, prudent financial and management policies. Therefore, this research will assist public investor to make right decision on Islamic DFIs investment including commercial papers and sukuk.

5.4 Limitations of the Study

The purpose of this research is to examine the performance of Islamic DFIs, and the impact of determinants on the profitability of Islamic DFIs in Malaysia. However, there are some limitations have been discovered in this research paper.

This research only studies two macroeconomic factors, which are GDP and inflation. Other macroeconomic and qualitative factors such as foreign exchange rate, political, social and environment factors have been neglected in the research. Therefore, the result of this study might not perfect to measure the profitability and performance of Islamic DFIs in Malaysia.

Moreover, the research covers insufficient sample sizes as there are some difficulties in data collection process. Some Islamic DFIs do not have complete annual reports where there are missing period on the annual report. Besides, some of the Islamic DFIs, including Sabah Development Bank, Sabah Credit Corporation Berhad, Credit Guarantee Corporation Berhad (CGC) do not disclose any financial annual reports in the particular years. Therefore, the cross sectional data used in this research is insufficient to represent and explain overall industry of the Islamic DFIs in the examined year.

Last but not least, this research only includes ROA ratio as the proxy to measure the performance of Islamic DFIs in Malaysia. This is because Islamic DFIs target on different market areas. For instance, SME Bank targets on small and medium enterprises (SME) financing while Lembaga Tabung Haji mainly focus on investment in pilgrimage activity. Therefore, it might be not comprehensive in evaluating each performance of Islamic DFIs by only using ROA as the financial ratio tools.

5.5 Recommendations for Future Research

Future research is suggested to cover other significant variables to obtain a comprehensive overview on the effect of various determinants on the profitability of Islamic DFIs. Future research should take into account qualitative factors and other macroeconomic factors, including impact of risk faced by the institution, global financial crisis and regulations by Bank Negara Malaysia (BNM) as they may have significant relationship with the profitability of Islamic DFIs in Malaysia.

In addition, Future research is suggested to include other financial ratio tools in evaluating and comparing the financial strength and ability of Islamic DFIs in performing their commercial commitment. Other financial ratio tools such as Return on Equity (ROE), Total Revenue to Total Assets Ratio and Operating Expenses to Deposit Ratio can be utilized to make comparative analysis from various financial aspects between the Islamic DFIs (Islam, 2012).

5.6 Conclusion

In this chapter, the major findings of the study have been included. Apart from that, the limitations and recommendations for the issues have also been highlighted for the purposes of future research. Next, this research is able to make contribution to various parties including institutional managers, government policymakers, academicians and public investors.

In conclusion, this research is conducted to investigate the relationship between the profitability of Islamic DFIs in Malaysia with the determinants throughout the period from year 2009 to 2014. The determinants of this research are liquidity, liability, capital adequacy, institutional size, GDP and inflation. Moreover, the performance of the Islamic DFIs has been evaluated by using ROA. The outcomes of this research are able to provide clearer view on the determinants and performance of Islamic DFIs in Malaysia. Lastly, the research objectives and research questions of the study have been fulfilled.

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APPENDICES

Appendix 1: Unit Root Test for Return on Asset (ROA)

Null Hypothesis: Unit root (individual unit root process)

Series: ROA

Date: 02/25/16 Time: 00:03

Sample: 2009 2014

Exogenous variables: Individual effects, individual linear trends

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 30

Cross-sections included: 6

Method	Statistic	Prob.**
PP - Fisher Chi-square	24.0168	0.0202
PP - Choi Z-stat		NA

Test statistic value of 'NA' due to the present of a p-value of one or zero

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

Intermediate Phillips-Perron test results ROA

Cross section	Prob.	Bandwidth	Obs
Agrobank	0.0004	4.0	5
Bank Pembangunan Malaysia Bhd	0.0182	4.0	5
Bank Rakyat	0.8497	4.0	5
Bank Simpanan Nasional	1.0000	4.0	5
Tabung Haji	1.0000	4.0	5
SME	0.8951	4.0	5

Source: Developed for the research via EViews 7

Appendix 2: Unit Root Test for Liquidity

Null Hypothesis: Unit root (individual unit root process)

Series: LOAN

Date: 02/24/16 Time: 23:59

Sample: 2009 2014

Exogenous variables: Individual effects, individual linear trends

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 30

Cross-sections included: 6

Method	Statistic	Prob.**
PP - Fisher Chi-square	36.5285	0.0003
PP - Choi Z-stat	-3.05671	0.0011

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

Intermediate Phillips-Perron test results LOAN

Cross section	Prob.	Bandwidth	Obs
Agrobank Bank	0.0059	4.0	5
Pembangunan Malaysia Bhd	0.7459	4.0	5
Bank Rakyat	0.4706	4.0	5
Bank Simpanan Nasional	0.0013	4.0	5
Tabung Haji	0.0111	4.0	5
SME	0.4007	4.0	5

Source: Developed for the research via EViews 7

Appendix 3: Unit Root Test for Liability

Null Hypothesis: Unit root (individual unit root process)

Series: DEPO

Date: 02/24/16 Time: 23:59

Sample: 2009 2014

Exogenous variables: Individual effects, individual linear trends

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 30

Cross-sections included: 6

Method	Statistic	Prob.**
PP - Fisher Chi-square	42.3459	0.0000
PP - Choi Z-stat	-4.16968	0.0000

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

Intermediate Phillips-Perron test results DEPO

Cross section	Prob.	Bandwidth	Obs
Agrobank Bank	0.2579	4.0	5
Pembangunan Malaysia Bhd	0.1145	4.0	5
Bank Rakyat	0.0767	1.0	5
Bank Simpanan Nasional	0.0001	4.0	5
Tabung Haji	0.0351	4.0	5
SME	0.0802	4.0	5

Source: Developed for the research via EViews 7

Appendix 4: Unit Root Test for Capital Adequacy

Null Hypothesis: Unit root (individual unit root process)

Series: EQUI

Date: 02/25/16 Time: 00:00

Sample: 2009 2014

Exogenous variables: Individual effects, individual linear trends

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 30

Cross-sections included: 6

Method	Statistic	Prob.**
PP - Fisher Chi-square	35.5241	0.0004
PP - Choi Z-stat	-2.61182	0.0045

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

Intermediate Phillips-Perron test results EQUI

Cross section	Prob.	Bandwidth	Obs
Agrobank Bank	0.0295	4.0	5
Pembangunan Malaysia Bhd	0.0074	4.0	5
Bank Rakyat	0.0723	4.0	5
Bank Simpanan Nasional	0.9959	4.0	5
Tabung Haji	0.2486	4.0	5
SME	0.0050	4.0	5

Source: Developed for the research via EViews 7

Appendix 5: Unit Root Test for Institutional Size

Null Hypothesis: Unit root (individual unit root process)

Series: SIZE

Date: 02/25/16 Time: 00:00

Sample: 2009 2014

Exogenous variables: Individual effects, individual linear trends

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 30

Cross-sections included: 6

Method	Statistic	Prob.**
PP - Fisher Chi-square	31.3604	0.0017
PP - Choi Z-stat	-3.38607	0.0004

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

Intermediate Phillips-Perron test results SIZE

Cross section	Prob.	Bandwidth	Obs
Agrobank Bank	0.1932	4.0	5
Pembangunan Malaysia Bhd	0.1602	4.0	5
Bank Rakyat	0.0796	4.0	5
Bank Simpanan Nasional	0.1732	4.0	5
Tabung Haji	0.0514	4.0	5
SME	0.0071	4.0	5

Source: Developed for the research via EViews 7

Appendix 6: Unit Root Test for GDP

Null Hypothesis: Unit root (individual unit root process)

Series: GDP

Date: 02/25/16 Time: 00:01

Sample: 2009 2014

Exogenous variables: Individual effects, individual linear trends

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 30

Cross-sections included: 6

Method	Statistic	Prob.**
PP - Fisher Chi-square	110.524	0.0000
PP - Choi Z-stat	-9.10969	0.0000

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

Intermediate Phillips-Perron test results GDP

Cross section	Prob.	Bandwidth	Obs
Agrobank Bank	0.0001	4.0	5
Pembangunan Malaysia Bhd	0.0001	4.0	5
Bank Rakyat	0.0001	4.0	5
Bank Simpanan Nasional	0.0001	4.0	5
Tabung Haji	0.0001	4.0	5
SME	0.0001	4.0	5

Source: Developed for the research via EViews 7

Appendix 7: Unit Root Test for Inflation

Null Hypothesis: Unit root (individual unit root process)

Series: INF

Date: 02/25/16 Time: 00:01

Sample: 2009 2014

Exogenous variables: Individual effects

Newey-West automatic bandwidth selection and Bartlett kernel

Total (balanced) observations: 30

Cross-sections included: 6

Method	Statistic	Prob.**
PP - Fisher Chi-square	28.1096	0.0053
PP - Choi Z-stat	-3.19451	0.0007

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

Intermediate Phillips-Perron test results INF

Cross section	Prob.	Bandwidth	Obs
Agrobank	0.0961	4.0	5
Bank			
Pembangunan			
Malaysia Bhd	0.0961	4.0	5
Bank Rakyat	0.0961	4.0	5
Bank Simpanan			
Nasional	0.0961	4.0	5
Tabung Haji	0.0961	4.0	5
SME	0.0961	4.0	5

Source: Developed for the research via EViews 7

Appendix 8: Result of VIF between Liquidity and Independent Variables

Dependent Variable: LOAN

Method: Least Squares

Date: 02/26/16 Time: 00:19

Sample: 1 36

Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEPO	-0.655680	0.114770	-5.712978	0.0000
EQUI	-1.764162	0.210249	-8.390823	0.0000
SIZE	0.366438	0.068785	5.327276	0.0000
GDP	-0.004763	0.008257	-0.576843	0.5683
INF	-0.012905	0.025982	-0.496680	0.6230
C	-2.501521	0.645322	-3.876391	0.0005
R-squared	0.704381	Mean dependent var	0.537899	
Adjusted R-squared	0.655111	S.D. dependent var	0.183014	
S.E. of regression	0.107479	Akaike info criterion	-1.472032	
Sum squared resid	0.346552	Schwarz criterion	-1.208112	
Log likelihood	32.49658	Hannan-Quinn criter.	-1.379917	
F-statistic	14.29637	Durbin-Watson stat	0.216730	
Prob(F-statistic)	0.000000			

Source: Developed for the research via EViews 7

Appendix 9: Result of VIF between Liability and Independent Variables

Dependent Variable: DEPO
 Method: Least Squares
 Date: 02/26/16 Time: 00:21
 Sample: 1 36
 Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EQUI	-2.049044	0.198391	-10.32829	0.0000
SIZE	0.466537	0.062482	7.466712	0.0000
GDP	-0.005838	0.009078	-0.643107	0.5250
INF	-0.015870	0.028575	-0.555379	0.5828
LOAN	-0.794684	0.139102	-5.712978	0.0000
C	-3.397744	0.610501	-5.565497	0.0000
R-squared	0.789544	Mean dependent var	0.538634	
Adjusted R-squared	0.754468	S.D. dependent var	0.238793	
S.E. of regression	0.118325	Akaike info criterion	-1.279760	
Sum squared resid	0.420021	Schwarz criterion	-1.015840	
Log likelihood	29.03567	Hannan-Quinn criter.	-1.187644	
F-statistic	22.50956	Durbin-Watson stat	0.296707	
Prob(F-statistic)	0.000000			

Source: Developed for the research via EViews 7

Appendix 10: Result of VIF between Capital Adequacy and Independent Variables

Dependent Variable: EQUI
 Method: Least Squares
 Date: 02/26/16 Time: 00:22
 Sample: 1 36
 Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SIZE	0.214642	0.023211	9.247495	0.0000
GDP	-0.002498	0.003915	-0.638194	0.5282
INF	-0.007530	0.012307	-0.611897	0.5452
LOAN	-0.397476	0.047370	-8.390823	0.0000
DEPO	-0.380909	0.036880	-10.32829	0.0000
C	-1.576808	0.240718	-6.550444	0.0000
R-squared	0.894804	Mean dependent var	0.214743	
Adjusted R-squared	0.877271	S.D. dependent var	0.145625	
S.E. of regression	0.051016	Akaike info criterion	-2.962328	
Sum squared resid	0.078080	Schwarz criterion	-2.698408	
Log likelihood	59.32191	Hannan-Quinn criter.	-2.870213	
F-statistic	51.03629	Durbin-Watson stat	0.287518	
Prob(F-statistic)	0.000000			

Source: Developed for the research via EViews 7

Appendix 11: Result of VIF between Institutional Size and Independent Variables

Dependent Variable: SIZE
 Method: Least Squares
 Date: 02/26/16 Time: 00:23
 Sample: 1 36
 Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	0.009569	0.015701	0.609423	0.5468
INF	0.037649	0.049161	0.765825	0.4498
LOAN	1.326622	0.249024	5.327276	0.0000
DEPO	1.393573	0.186638	7.466712	0.0000
EQUI	3.448974	0.372963	9.247495	0.0000
C	8.097928	0.277344	29.19809	0.0000
R-squared	0.755279	Mean dependent var	10.42425	
Adjusted R-squared	0.714492	S.D. dependent var	0.382726	
S.E. of regression	0.204502	Akaike info criterion	-0.185470	
Sum squared resid	1.254628	Schwarz criterion	0.078450	
Log likelihood	9.338453	Hannan-Quinn criter.	-0.093354	
F-statistic	18.51771	Durbin-Watson stat	0.242435	
Prob(F-statistic)	0.000000			

Source: Developed for the research via EViews 7

Appendix 12: Result of VIF between GDP and Independent Variables

Dependent Variable: GDP
 Method: Least Squares
 Date: 02/26/16 Time: 00:24
 Sample: 1 36
 Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	1.946628	0.450308	4.322880	0.0002
LOAN	-2.303067	3.992535	-0.576843	0.5683
DEPO	-2.329176	3.621757	-0.643107	0.5250
EQUI	-5.361450	8.400969	-0.638194	0.5282
SIZE	1.277961	2.097001	0.609423	0.5468
C	-9.134761	17.30400	-0.527899	0.6015
R-squared	0.424802	Mean dependent var	4.564264	
Adjusted R-squared	0.328936	S.D. dependent var	2.885000	
S.E. of regression	2.363349	Akaike info criterion	4.709048	
Sum squared resid	167.5626	Schwarz criterion	4.972968	
Log likelihood	-78.76287	Hannan-Quinn criter.	4.801164	
F-statistic	4.431189	Durbin-Watson stat	3.146673	
Prob(F-statistic)	0.003853			

Source: Developed for the research via EViews 7

Appendix 13: Result of VIF between Inflation and Independent Variables

Dependent Variable: INF
 Method: Least Squares
 Date: 02/26/16 Time: 00:25
 Sample: 1 36
 Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOAN	-0.632011	1.272471	-0.496680	0.6230
DEPO	-0.641273	1.154659	-0.555379	0.5828
EQUI	-1.636910	2.675141	-0.611897	0.5452
SIZE	0.509305	0.665041	0.765825	0.4498
GDP	0.197173	0.045612	4.322880	0.0002
C	-3.106068	5.503554	-0.564375	0.5767
R-squared	0.427511	Mean dependent var	2.066118	
Adjusted R-squared	0.332096	S.D. dependent var	0.920351	
S.E. of regression	0.752160	Akaike info criterion	2.419277	
Sum squared resid	16.97234	Schwarz criterion	2.683196	
Log likelihood	-37.54698	Hannan-Quinn criter.	2.511392	
F-statistic	4.480549	Durbin-Watson stat	2.937294	
Prob(F-statistic)	0.003619			

Source: Developed for the research via EViews 7

Appendix 14: Result of White Test

Heteroskedasticity Test: White

F-statistic	0.787181	Prob. F(27,8)	0.7006
Obs*R-squared	26.15515	Prob. Chi-Square(27)	0.5100
Scaled explained SS	18.49326	Prob. Chi-Square(27)	0.8877

Test Equation:
 Dependent Variable: RESID^2
 Method: Least Squares
 Date: 02/26/16 Time: 00:17
 Sample: 1 36
 Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.094700	0.165481	0.572269	0.5829
LOAN	0.005499	0.056978	0.096507	0.9255
LOAN^2	-0.000406	0.007613	-0.053307	0.9588
LOAN*DEPO	0.000552	0.011111	0.049672	0.9616
LOAN*EQUI	0.001062	0.024026	0.044204	0.9658
LOAN*SIZE	-0.000521	0.007337	-0.071043	0.9451
LOAN*GDP	3.25E-05	0.000117	0.278333	0.7878
LOAN*INF	-0.000265	0.000540	-0.491380	0.6364
DEPO	-0.014137	0.076575	-0.184621	0.8581
DEPO^2	-0.002801	0.006768	-0.413903	0.6898
DEPO*EQUI	-0.022291	0.033718	-0.661097	0.5271
DEPO*SIZE	0.002088	0.009494	0.219922	0.8314
DEPO*GDP	-2.01E-05	0.000203	-0.098652	0.9238
DEPO*INF	-0.000351	0.000626	-0.561175	0.5900
EQUI	0.018446	0.119729	0.154066	0.8814
EQUI^2	-0.012896	0.034738	-0.371239	0.7201
EQUI*SIZE	7.68E-05	0.016302	0.004709	0.9964
EQUI*GDP	5.93E-05	0.000362	0.163890	0.8739
EQUI*INF	-0.000765	0.001303	-0.587098	0.5733
SIZE	-0.017780	0.041467	-0.428785	0.6794
SIZE^2	0.000790	0.002627	0.300828	0.7712
SIZE*GDP	-3.80E-05	8.99E-05	-0.423205	0.6833
SIZE*INF	0.000101	0.000281	0.360645	0.7277
GDP	0.000353	0.000690	0.512473	0.6222
GDP^2	3.50E-06	1.05E-05	0.334373	0.7467
GDP*INF	1.75E-06	6.64E-05	0.026371	0.9796
INF	-0.000356	0.002129	-0.167006	0.8715
INF^2	-3.99E-05	0.000104	-0.383017	0.7117
R-squared	0.726532	Mean dependent var	3.88E-05	
Adjusted R-squared	-0.196423	S.D. dependent var	5.81E-05	
S.E. of regression	6.36E-05	Akaike info criterion	-16.43668	
Sum squared resid	3.24E-08	Schwarz criterion	-15.20505	

Log likelihood	323.8602	Hannan-Quinn criter.	-16.00681
F-statistic	0.787181	Durbin-Watson stat	2.988117
Prob(F-statistic)	0.700580		

Source: Developed for the research via EViews 7

Appendix 15: Result of Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.273334	Prob. F(2,27)	0.2962
Obs*R-squared	3.102889	Prob. Chi-Square(2)	0.2119

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 02/26/16 Time: 00:17

Sample: 1 36

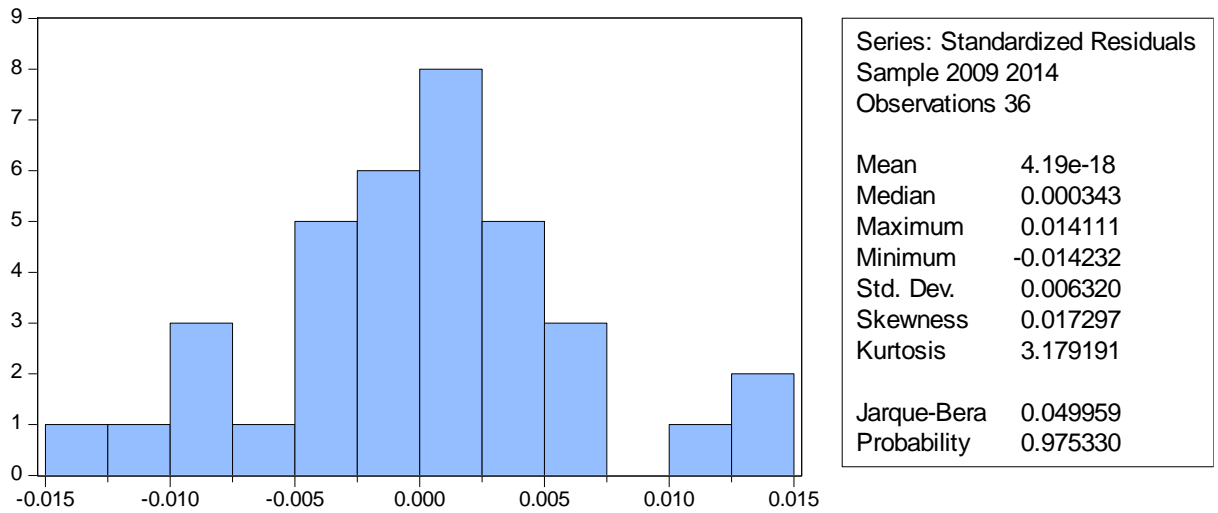
Included observations: 36

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOAN	0.003339	0.011995	0.278339	0.7829
DEPO	0.004027	0.010958	0.367484	0.7161
EQUI	0.005514	0.024889	0.221561	0.8263
SIZE	-0.002287	0.006388	-0.358105	0.7230
GDP	5.08E-05	0.000547	0.092912	0.9267
INF	0.000492	0.001708	0.288304	0.7753
C	0.017457	0.052484	0.332622	0.7420
RESID(-1)	0.031742	0.195726	0.162174	0.8724
RESID(-2)	-0.319874	0.202733	-1.577809	0.1263
R-squared	0.086191	Mean dependent var	2.54E-18	
Adjusted R-squared	-0.184567	S.D. dependent var	0.006320	
S.E. of regression	0.006879	Akaike info criterion	-6.908505	
Sum squared resid	0.001277	Schwarz criterion	-6.512625	
Log likelihood	133.3531	Hannan-Quinn criter.	-6.770332	
F-statistic	0.318333	Durbin-Watson stat	2.039243	
Prob(F-statistic)	0.952046			

Source: Developed for the research via EViews 7

Appendix 16: Result of Jarque-Bera Test



Source: Developed for the research via EViews 7

Appendix 17: Result of Ramsey RESET Test

Ramsey RESET Test

Equation: UNTITLED

Specification: ROA LOAN DEPO EQUI SIZE GDP INF C

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.462956	28	0.6470
F-statistic	0.214328	(1, 28)	0.6470
Likelihood ratio	0.274515	1	0.6003

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	1.06E-05	1	1.06E-05
Restricted SSR	0.001398	29	4.82E-05
Unrestricted SSR	0.001387	28	4.95E-05
Unrestricted SSR	0.001387	28	4.95E-05

LR test summary:

	Value	df
Restricted LogL	131.7307	29
Unrestricted LogL	131.8679	28

Unrestricted Test Equation:

Dependent Variable: ROA

Method: Least Squares

Date: 02/26/16 Time: 00:11

Sample: 1 36

Included observations: 36

Variable	Coefficien t	Std. Error	t-Statistic	Prob.
LOAN	0.002426	0.016620	0.145972	0.8850
DEPO	0.056982	0.030966	1.840134	0.0764
EQUI	0.133527	0.086031	1.552088	0.1319
SIZE	-0.007098	0.006431	-1.103670	0.2791
GDP	0.000815	0.000828	0.985237	0.3329
INF	-0.000878	0.001920	-0.457200	0.6511
C	0.031375	0.051856	0.605038	0.5500
FITTED^2	-16.56982	35.79136	-0.462956	0.6470
R-squared	0.693350	Mean dependent var	0.014862	
Adjusted R-squared	0.616687	S.D. dependent var	0.011369	
S.E. of regression	0.007039	Akaike info criterion	-6.881552	
Sum squared resid	0.001387	Schwarz criterion	-6.529659	
Log likelihood	131.8679	Hannan-Quinn criter.	-6.758731	
F-statistic	9.044177	Durbin-Watson stat	1.896695	

Prob(F-statistic) 0.000008

Source: Developed for the research via EViews 7

Appendix 18: Result of Poolability Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	2.040160	(5,24)	0.1089
Cross-section Chi-square	12.751028	5	0.0258

Cross-section fixed effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 02/25/16 Time: 00:04

Sample: 2009 2014

Periods included: 6

Cross-sections included: 6

Total panel (balanced) observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOAN	0.007770	0.011794	0.658795	0.5152
DEPO	0.043556	0.010713	4.065718	0.0003
EQUI	0.095444	0.024847	3.841222	0.0006
SIZE	-0.006465	0.006199	-1.042990	0.3056
GDP	0.000527	0.000536	0.981680	0.3344
INF	-0.000472	0.001685	-0.280219	0.7813
C	0.032692	0.051071	0.640124	0.5271
R-squared	0.691002	Mean dependent var		0.014862
Adjusted R-squared	0.627072	S.D. dependent var		0.011369
S.E. of regression	0.006943	Akaike info criterion		-6.929482
Sum squared resid	0.001398	Schwarz criterion		-6.621575
Log likelihood	131.7307	Hannan-Quinn criter.		-6.822014
F-statistic	10.80865	Durbin-Watson stat		1.478452
Prob(F-statistic)	0.000003			

Source: Developed for the research via EViews 7

Appendix 19: Result of Pooled OLS

Dependent Variable: ROA
 Method: Panel Least Squares
 Date: 02/24/16 Time: 22:39
 Sample: 2009 2014
 Periods included: 6
 Cross-sections included: 6
 Total panel (balanced) observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOAN	0.007770	0.011794	0.658795	0.5152
DEPO	0.043556	0.010713	4.065718	0.0003
EQUI	0.095444	0.024847	3.841222	0.0006
SIZE	-0.006465	0.006199	-1.042990	0.3056
GDP	0.000527	0.000536	0.981680	0.3344
INF	-0.000472	0.001685	-0.280219	0.7813
C	0.032692	0.051071	0.640124	0.5271
R-squared	0.691002	Mean dependent var	0.014862	
Adjusted R-squared	0.627072	S.D. dependent var	0.011369	
S.E. of regression	0.006943	Akaike info criterion	-6.929482	
Sum squared resid	0.001398	Schwarz criterion	-6.621575	
Log likelihood	131.7307	Hannan-Quinn criter.	-6.822014	
F-statistic	10.80865	Durbin-Watson stat	1.478452	
Prob(F-statistic)	0.000003			

Source: Developed for the research via EViews 7