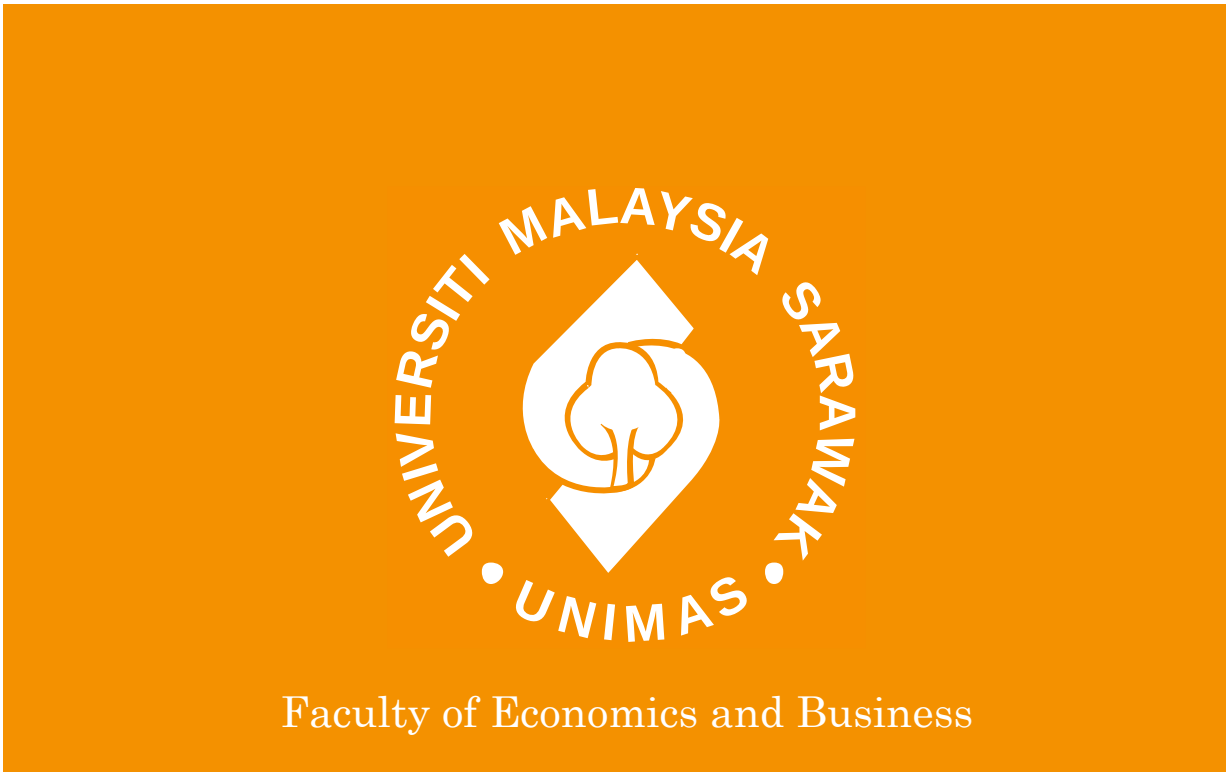

DO ISLAMIC BANKS ACHIEVE BETTER FINANCIAL PERFORAMNCE THAN CONVENTIONAL BANKS IN MALAYSI?

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Bachelor of Finance with Honours
2013

DO ISLAMIC BANKS ACHIEVE BETTER FIANNCIAL PERFORAMNCE THAN CONVENTIONAL BANKS IN MALAYSIA?

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THIS PROJECT IS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF BACHELOR OF FINANCE WITH HONOURS (FINANCE)

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Statement of Originality

The work described in this Final Year Project, entitled

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is to the best of the author's knowledge that of the author except where due reference is made.

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ABSTRACT

DO ISLAMIC BANKS ACHIEVE BETTER FINANCIAL PERFORMANCE THAN CONVENTIONAL BANKS IN MALAYSIA?

by

Tan Bee Ting

This paper compares financial performance of Islamic banks with conventional banks in Malaysia for five years covering the 2007 to 2011 period. Additionally, this study also determines if there is any relationship between the financial ratios of Islamic banks and conventional banks. Data are collected from annual reports for each of the banks. Descriptive statistics, coefficient of variation, and Mann-Whitney Wilcoxon test are the techniques used to compare the financial performance of Islamic banks and conventional banks. Shapiro-Wilk statistics and Spearman's correlation coefficient are used to determine if there is any relationship between the financial ratios. The variables used include profitability ratios, liquidity ratios, risk and solvency ratios as well as efficiency ratios. This study includes 15 Islamic banks and 16 conventional banks. Findings of this study show that Islamic banks performed significantly better than conventional banks only in terms of liquidity ratios but significantly underperformed for profitability ratios, risk and solvency ratios as well as efficiency ratios. These findings support those of Widagdo and Ika (2008); Ika and Abdullah (2011).

Keywords: Islamic banks, conventional banks, financial performance, Malaysia

ABSTRAK

ADAKAH BANK ISLAM MENCAPAI PRESTASI KEWANAGAN LEBIH BAIK DARIPADA BANK KONVENSIONAL DI MALAYSIA?

oleh

Tan Bee Ting

Kajian ini dijalankan untuk membanding prestasi kewangan bank-bank Islam dengan bank-bank konvensional di Malaysia untuk tempoh lima tahun, bermula dari tahun 2007 sehingga tahun 2011. Di samping itu, kajian ini juga bertujuan untuk meneliti hubungan di antara nisbah-nisbah kewangan yang digunakan dalam kajian ini. Kaedah statistik deskriptif, pekali variasi, dan ujian *Mann-Whitney Wilcoxon* digunakan untuk berbanding prestasi kewangan bank-bank Islam dengan bank-bank konvensional. Statistik *Shapiro-Wilk* dan pekali korelasi *Spearman* juga digunakan untuk mengenalpasti sama ada terdapat hubungan antara nisbah kewangan. Pembolehubah-pembolehubah yang digunakan dalam kajian ini termasuklah nisbah keuntungan, nisbah kecairan, nisbah risiko dan kesolvenan, serta nisbah kecekapan. Kajian in meliputi 15 bank Islam dan 16 bank konvensional. Keputusan kajian menunjukkan bahawa prestasi kewangan bank-bank Islam lebih baik daripada bank-bank konvensional dari segi nisbah kecairan tetapi dengan ketara kurang baik dalam berprestasi dari segi nisbah keuntungan, nisbah risiko dan kesolvenan, serta nisbah kecekapan.

Kata kunci: bank-bank Islam, bank-bank konvensional, prestasi kewangan, Malaysia

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CHAPTER ONE

INTRODUCTION

1.0 Introduction

Malaysia has been recognised as the pioneer and at the forefront in Islamic banking and finance. About a decade ago, Islamic banking system in Malaysia has already earned the international reputation of being more progressive and resilience compared to similar banking system in other Muslim countries (Haron, 2004). At present, Malaysia surpasses other Muslim countries in terms of market infrastructure owing to the unwavering support by the government in providing the impetus for growth of the local Islamic capital market (Bursa Malaysia (BM), 2012).

A dual banking system has been implemented successfully in Malaysia in which Islamic banking system operates side by side with the conventional banking system (Sufian, 2010). Apart from that, Malaysia is among the first nations to have full-fledged banking system. The first Islamic bank in Malaysia was Bank Islamic Malaysia Berhad (BIMB), which was officially launched on 1 July 1983. Currently, the country has significant numbers of full-fledged Islamic banks. Malaysia continues to progress and to build on the industry by inviting foreign financial institutions to establish international Islamic banking business in Malaysia to conduct foreign currency business (Bank Negara Malaysia (BNM), 2012). Today, Malaysia's Islamic banking that is renowned for continuous product innovation continues to grow rapidly supported by conducive environment with comprehensive

financial infrastructure and by adopting global regulatory and legal best practices (Jamalluddin, 2012).

It is interesting to look at the current achievement of Islamic banks and compare it to the conventional banks since rapid liberalisation in the Islamic finance industry has encouraged foreign financial institutions to make Malaysia their destination of choice to conduct Islamic banking business (Bahari, 2009). This is evident for Islamic banking system has started their moves to compete with conventional banking system. However, are they far away from the long established conventional bank? It leads this study to concern about the financial performance of Islamic banks and conventional banks in Malaysia. This study is set to evaluate if the financial performance of Islamic banks is better than conventional banks. An analysis uses the financial ratios will be applied in this study to indicate the profitability ratios, liquidity ratios, risk and solvency ratios as well as efficiency ratios as a measure of the performance of both types of banks.

The major finding of this study is that Islamic Banks performed significantly better than conventional banks only in terms of liquidity ratios. Nevertheless, Islamic banks significantly underperformed in other aspects including profitability ratios, risk and solvency ratios as well as efficiency ratios.

This chapter is organised as follows: Section 1.1 provides the background of Islamic banking; Section 1.2 provides the background of conventional banking; and Section 1.3 explains the differences between Islamic banks and conventional banks.

The problem statement, objectives of study, significance of study and organization of the study are given in Section 1.4 to 1.7 respectively.

1.1 Background of Islamic Banks

Islamic finance industry in Malaysia has been in existence for over 30 years. The enactment of the Islamic Banking Act 1983 enabled the country's first Islamic Bank (Bank Islamic Malaysia Berhad (BIMB) established in 1983 and thereafter, with the liberalisation of the Islamic financial system, more Islamic financial institutions have been established. According to Annual Banking Statistics from Bank Negara Malaysia in 2007, Islamic banking assets in Malaysia have reached USD65.6 billion with an average growth rate of 18-20% annually.

Beginning in 1983, the Islamic banking system has transformed from a humble to an energetic and forceful system that is able to fulfil the banking needs of Muslims and non-Muslims. Today, the Islamic banking in Malaysia runs parallel to the conventional banking and provides depositors with an alternative banking philosophy that is rapidly gaining acceptance from both Muslims and non-Muslims (Ahmad & Haron, 2002).

In association with the growth of Islamic banking it was subjected to many criticisms, one of these criticisms is that the operating Islamic banks do not use all the Islamic financing instruments, they are using only some instruments which fulfil the benefits and the profitability to the bank and its share holders, and they abandon

or avoid some other financing instruments which are more beneficial to the bank customers and more related to main principles of Islamic finance theory. Islamic banking prohibits dealing in interest and the traditional financing tools which are used by conventional banking. Hence, they created some other financing tools which are compatible with Islamic *Shariah*. By avoiding such instruments, the real activities and services of Islamic banks became strongly close to those provided by conventional banks (El-Agamy, 2008).

In 1969, Lembaga Urusan Tabung Haji (LUTH) was the first institution to use *Shariah* principles in its fund management operations for Muslims going on pilgrimage. LUTH pays a dividend earned out of its investments in equities and other securities instead of paying interest to its subscribers. Before dividend is distributed to its members, a *zakat* is paid by LUTH based on both the profits earned during the *zakat* year and the amount of working capital at the end of the *zakat* financial year. Nevertheless, LUTH is mainly a savings institution and hence lack of any financial innovation and incentives in its schemes (Abdullah, 2011).

The first Islamic bank in Malaysia was Bank Islam Malaysia Berhad (BIMB), which was officially launched on 1 July 1983 by former Prime Minister Tun Dr Mahathir Mohamad and was licensed and regulated by Bank Negara Malaysia (BNM) with an authorized capital of RM500 million and a paid-up capital of RM79.9 million under the Islamic Banking Act (BIMB Holdings Berhad, 2013). This marked the beginning of the government's commitment towards the development of a comprehensive Islamic financial system in Malaysia.

BIMB Holdings Berhad (BHB) was established on March 20, 1997 and listed on the Main Market of Bursa Malaysia on September 16, 1997. BIMB Holdings Berhad is an investment holding company. The company operates in three segments: Banking, which is engaged in the Islamic banking and provision of related services; Takaful, which is engaged underwriting of family and general Islamic insurance (Takaful), and others, which includes investment holding, currency trading, *ijarah* financing, stock-broking and unit trust. On February 7, 2011, the company acquired 20% interest in Sri Lanka based Amana Bank Ltd. On August 11, 2011, the company acquired the remaining 20% in Farihan Corporation Sdn. Bhd., thus making it a 100% wholly owned subsidiary of the company. Its subsidiaries include Bank Islam Malaysia Berhad, Syarikat Takaful Malaysia Berhad and BIMB Securites (Holdings) Sdn. Bhd. In 23rd April 2013, Lembaga Tabung Haji held 51.31% interest in BHB (BIMB Holdings Berhad, 2013).

Bank Muamalat Malaysia Berhad is the second full-fledge Islamic bank established in Malaysia after Bank Islam Malaysia Berhad. It started its operations on October 1, 1999 with a combined assets and liabilities brought over from the Islamic banking windows of the Bank Bumiputra Malaysia Berhad (BBMB), Bank of Commerce (M) Berhad and BBMB Kewangan. Bank Muamalat Malaysia Berhad is poised to play its role in providing Islamic banking products and services to Malaysians, irrespective of race or religious beliefs, thus contributing to the development of modern Malaysia. The shareholders comprise DRB-HICOM, which holds 70% shares in the Bank while Khazanah Nasional Berhad holds the remaining shares (Bank Muamalat Malaysia Berhad, 2013).

Malaysia as an international Islamic financial hub was to bring forward the liberalisation of its Islamic banking sector to 2004, three years ahead of the World Trade Organisation's deadline, by granting three new Islamic new licenses to foreign institutions. These three Islamic financial institutions are from the Middle-East, namely Kuwait Finance House, Al-Rajhi Banking & Investment Corporation and a consortium of Islamic Finance institutions represented by Qatar Islamic Bank, RUSD Investment Bank Inc., and Global Investment House (Haron, 2004).

In September 2006, Bank Negara Malaysia announced the issuance of new licenses under the Islamic Banking Act 1983 (IBA) to qualified foreign and Malaysian financial institutions to conduct Islamic banking business in international currencies other than Malaysian ringgit. Financial institutions that carry out such business, referred to as "International Islamic Bank, (IIB)" are allowed to conduct a wide array of international Islamic banking business with non-residents and residents.

For the purpose of exchange control administration policies, the IIB is defined as a resident and is eligible for full tax exemption accorded under the Income Tax Act 1967 for 10 years beginning from the assessment year of 2007. The Guidelines is applicable to IIB that operates either as a subsidiary or as a branch which is issued pursuant to section 53A of the IBA and comes into force on 24 March 2008, shall supersede the "Guidelines on the Establishment of International Islamic Bank" issued in September 2006. Then, IIB was issued to Elaf Bank in 2008 (BNM, 2010). Table 1.1 shows all Islamic banks in Malaysia with the incorporation dates.

Table 1.1: Summary of All Islamic Banks in Malaysia

Islamic Banks	Incorporation Date
Affin Islamic Bank Berhad	April 1, 2006
Al Rahji Banking & Investment Corporation (M) Berhad	October 1, 2006
Alliance Islamic Bank Berhad	June, 2007
AmIslamic Bank Berhad	May 1, 2006
Asian Finance Bank Berhad	November 28, 2005
Bank Islam Malaysia Berhad	July 1, 1983
Bank Muamalat Malaysia Berhad	October 1, 1999
CIMB Islamic Bank Berhad	June, 2003
Hong Leong Islamic Bank Berhad	March 28, 2005
HSBC Amanah Malaysia Berhad	August 11, 2006
Kuwait Finance House (Malaysia) Berhad	February 17, 2006
Maybank Islamic Berhad	January 1, 2008
OCBC Al-Amin Bank Berhad	December 1, 2008
Public Islamic Bank Berhad	November 1, 2008
RHB Islamic Bank Berhad	March 1, 2005
Standard Chartered Saaqid Berhad	November 12, 2008

Source: Bank Negara Malaysia (2012)

1.2 Background of Conventional Banks

The first commercial bank established in the country was a branch of a British exchange bank called The Chartered Mercantile Bank of India, London and China (later renamed as the Mercantile Bank) in Penang in 1859. This was followed by The Chartered Bank establishing a branch in Penang in 1875 (Institut Bank-Bank Malaysia (IBBM), 2012).

The first domestic bank to be incorporated in Kuala Lumpur was the Kwong Yik (Selangor) Banking Corporation in July 1913. By 1917, branches of a Singapore-incorporated bank had established branches in Malacca and Muar. By the late 1920s and 1930s, businessmen and traders incorporated new indigenous banks (IBBM, 2012).

In 1959, a group of businessmen, led by Mr. Chang Ming Thien, a prominent figure in the rubber industry in Malaya and Singapore set up the United Malayan Banking Corporation Berhad (UMBC). It then officially declared open by Prime Minister Tunku Abdual Rahman Putra Al-Haj in 1960. UMBC was the first conventional bank established in independent Malaya. After that, UMBC became part of Sime Darby Berhad and was renamed Sime Bank Berhad in 1996. Three years later, which was in 1999 Sime Bank Berhad merged with RHB Bank Berhad and became part of the RHB Banking Group (RHB, 2012).

On July 2012, Bank Negara Malaysia (BNM) which is the central bank of Malaysia announced that the total numbers of 27 conventional banks and 16Islamic banks. The first conventional bank entered Malaysia much earlier than the first Islamic bank in Malaysia. Conversely, it seems that the number of Islamic banks in Malaysia is going to compete with conventional banks in Malaysia. Table 1.2 below shows all conventional banks in Malaysia with the incorporation dates.

Table 1.2: Summary of All Conventional Banks in Malaysia

Conventional Banks	Incorporation Date
Affin Bank Berhad	January, 2001
Alliance Bank Malaysia Berhad	1958
AmBank (M) Berhad	Not Available
BNP Paribas Malaysia Berhad	June 1, 2011
Bangkok Bank Berhad	May 12, 1994
Bank of America Malaysia Berhad	September, 1994
Bank of China (M) Berhad	February 23, 2001
Bank of Tokyo-Mitsubishi UFJ (M) Berhad	June 1, 1994
CIMB Bank Berhad	1986
Citibank Berhad	1994
Deutsche Bank (M) Berhad	1967
HSBC Bank Malaysia Berhad	1994
Hong Leong Bank Berhad	1905
India International Bank (M) Berhad	July 11, 2012
Industrial and Commercial Bank of China (M) Berhad	January 28, 2010
J. P. Morgan Chase Bank Berhad	1994
Malayan Banking Berhad	May 31, 1960
Mizuho Corporate Bank (M) Berhad	April 1, 2002
National Bank of Abu Dhabi Malaysia Berhad	July 5, 2012
OCBC Bank (M) Berhad	January 1, 1948
Public Bank Berhad	December 30, 1965
RHB Bank Berhad	July 1, 1997
Standard Chartered Bank Malaysia Berhad	February 29, 1984
Sumitomo Mitsui Banking Corporation Malaysia Berhad	Not Available
The Bank of Nova Scotia Berhad	1994
The Royal Bank of Scotland Berhad	2008
United Overseas Bank (M) Berhad	July 29, 1993

Source: Bank Negara Malaysia (2012)

1.3 The differences between Islamic Banks and Conventional Banks

The modes of operations between Islamic banks and conventional banks are different. The conventional banking operates on pre-fixed interest whilst Islamic banks based on profit sharing. Islamic banking refers to a system of banking or banking activity that is consistent with Islamic law (*Shariah*) principles and guided by Islamic economics. In particular, Islamic law prohibits usury, the collection and

payment of interest, also commonly called *riba*. Generally, Islamic law also prohibits trading in financial risk (which is seen as a form of gambling). The obvious different is the conventional banking operates on pre-fixed interest whilst Islamic banks based on profit sharing. The conventional banks earn profits by attracting deposits from the depositors at a low interest rate, then reselling those funds to the borrowers at higher interest rate, based on its competitive advantage at gathering information and underwriting risk. Therefore, conventional banks make profits from the spread between the interest rate received from borrowers and the interest rate paid to depositors (Mohamad, Hassan & Bader, n.d.).

The growth of Islamic banks and their performance are also being questioned. Can we say that Islamic banks are doing well compared to the conventional banks? Some argued that it is wrong to compared Islamic banks and conventional banks, when they have been in existence for decades. In this regard, conventional banks enjoy several advantages over Islamic banks. For example, conventional banks have very long history and experience, accept interest which is a major source of bank revenues, do not share loss with clients and ask for guaranteed collaterals in most transactions, enjoy very huge capital, spread widely, have much more developed technologies, can enter Islamic banking market (*e.g.* Citibank, Bank of America, Deutche Bank, ABN, AMRO, USB, HSBC, and ANZ Grindlays) and proved to benefit from theoretical and empirical research (Mohamad, et al., n.d.).

According to Samad (2004), many are sceptical about Islamic banks' performance as newcomers to the market. There are several reasons for this. First,

Islamic banks are non-conventional financial institution. Interest as the main income in conventional banks is completely prohibited under Islamic banking. Second, Islamic banks are required to follow two rules, firstly the conventional business laws (man-made law) and also the Islamic laws. The conventional banks are freely to enter any transactions as they like.

There are much more differences between Islamic banks and conventional banks. Hence, a summary of the differences between Islamic banks and conventional banks are shown in Table 1.3.

Table 1.3: Conceptual Difference between Islamic Banks and Conventional Banks

Conventional Banks	Islamic Banks
1. Conventional banks functions and operating modes are based on self developed principles.	1. Islamic banks functions and operating modes are based on the Islamic Shariah principles.
2. Conventional banks provide fixed return.	2. The Islamic banking based on profit and loss sharing.
3. Conventional banks focus only to generate profit without any restriction.	3. It also focuses to generate profit according to the Islamic Shariah principles.
4. Conventional banks only deals with tax but not deal for the collection and distribution of Zakat.	4. Islamic banks are used to provide services of collection and distribution of Zakat.
5. Conventional banks focus only on lending to get interest in shape of profit.	5. Islamic banking promotes partnership business.
6. The defaulter of the bank pays extra charges as a penalty.	6. Islamic banks are multipurpose institution because of this their scope is wider.
7. The bank has no concern with client's equity growth.	7. Islamic banks highly appreciate equity growth for public interest.
8. Conventional banks can easily borrow money from money market.	8. Islamic Shariah principle of profit and loss sharing provides equal opportunity to the both.
9. Conventional banks did not provide attention to develop expertise in project appraisal and evaluations.	9. Attention to developing projects appraisal and evaluation process is better due to profit and loss sharing principle.
10. Banks build relation with clients of creditor and debtors.	10. Islamic bank create a relation with client as a partner, investor and trader.
11. Conventional banks provide guarantee to clients for their deposits.	11. Islamic bank did not take responsibility of return of real equity.
12. Conventional bank greatly emphasis on the client creditworthiness.	12. Islamic banks clients can lose their actual deposit rather than the profit.

Source: Errico & Farahbaksh (1998)

1.4 Problem Statement

The basic framework for an Islamic financial system is a set of rules and laws collectively referred to as *Shariah*, governing economic, social, political, and cultural aspects of Islamic societies. Since the emergence of the term "Islamic financial system", the system was built on some basic principles like: prohibition of interest, risk sharing, prohibition of speculative behaviour, and sanctity of contracts. The Islamic financial system is founded on the absolute prohibition of the payment or receipt of any predetermined, guaranteed rate of return. This closes the door to the concept of interest and precludes the use of debt-based instruments. The system encourages risk-sharing, promotes entrepreneurship, discourage speculative behaviour, and emphasizes the sanctity of contracts (Iqbal, 1997).

The Islamic financial system has developed some basic instruments which stick to the basics of the system. Basic instruments include cost-plus financing *(Murabaha)*, profit-sharing *(Mudaraba)*, leasing *(Ijara)*, partnership *(Musharaka)* and forward sale (*Bay' Salam*). These instruments serve as the basic building blocks for developing a wide variety of more complex financial instruments (Iqbal, 1997).

According to the above bases and instruments, the Islamic finance are suppose to play a great role in economic development through promoting and encouraging entrepreneurs and business firms to expand their activities. Hence, it is important to know the financial performance of Islamic and conventional banks in Malaysia as the actuality of this situation may or may not consistent with the above theoretical

bases and the Islamic financing institutions may or may not play its aimed role. As such, few research questions have been identified as follows:

i. Is there any significant difference between the financial performances of Islamic and conventional banks in Malaysia?
ii. What is the relationship between the financial performance of Islamic and conventional banks in Malaysia, if any?

1.5 Objectives of Study

The general objective of this study is to compare the financial performance of Islamic banks with conventional banks in Malaysia. The specific objectives of this study are as follows:

i. To compute the financial performance of Islamic banks and conventional banks in Malaysia.
ii. To investigate if Islamic banks have a better financial performance compared to conventional banks in Malaysia.
iii. To determine if there is any relationship between the financial ratios of Islamic banks and conventional banks in Malaysia.

1.6 Significance of Study

In 1993, the Islamic window concept was introduced when BNM introduced the Interest Free Banking Scheme (later known as Islamic Bing Scheme (IBS) which

allowed existing conventional banks, merchant banks, finance companies and discount houses to offer Islamic banking products and services using their existing infrastructure and branches. With it, Malaysia has emerged as the first country to implement a dual banking system, whereby Islamic and conventional system co-exist and run concurrently in the financial system. However, these institutions were required to separate their funds and activities for Islamic banking transactions from that of conventional banking business to ensure that there would not be any co-mingling of funds.

So, based on the above explanation, this study is expected to provide empirical evidence on the financial performance of Islamic banks and conventional banks in Malaysia. The findings will be useful to customers especially when they have a long-term involvement with, or are dependent on the Islamic banks. Generally, the findings enable the customers to know if their Islamic banks they dealt with are financially sound.

Moreover, this study will be enlightening to investors as the findings will provide empirical evidence that will guide them to select banks that have less impact on their risk. Investors can use the findings to know the solvency position of Islamic banks. The financial information of Islamic banks help them determine whether they should buy, hold or sell their shares. This would help them to make logical investment decisions.

Furthermore, this study will be helpful for employees gain the information about the low or high stability and profitability of their respective companies; Islamic banks or conventional banks. They are also will gain the information which enables them to assess the ability of the Islamic banks to provide remuneration, retirement benefits and employment opportunities. In general, the findings enable the employees to know their jobs security.

1.7 Organization of Study

This study examines the financial performance of Islamic banks and conventional banks in Malaysia. Chapter 1 is related to the introduction such as the background of Islamic banks and conventional banks in a Malaysia, problem statement, objective and significant of study. Chapter 2 provides literature review on the financial performance, Islamic banks, conventional banks and other reviews that are related to this study. Chapter 3 explains the methodology that will be adopted to conduct the empirical analysis for this study. In this study, the four types of financial ratios would be used, that is, profitability ratios, liquidity ratios, risk and solvency ratios and efficiency ratios. Chapter 4 discusses the results of the empirical analysis. Lastly is Chapter 5, which contains the conclusion of this study with relevant recommendation and policy implementations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Chapter 2 intends to present the review of previous literatures that are related to this study. The study attempts to compare the financial performance of the Islamic banks and conventional banks in Malaysia. Several financial performance ratios are adopted for the forms of calculation and comparison. The concepts of the ratios are given in Section 2.1. To have an understanding of how previous studies have been conducted, the empirical testing procedures contained in previous studies are reviewed and the commonly used methods are given in Section 2.2. The empirical evidences are discussed in Section 2.3, while Section 2.4 concludes the literature review chapter.

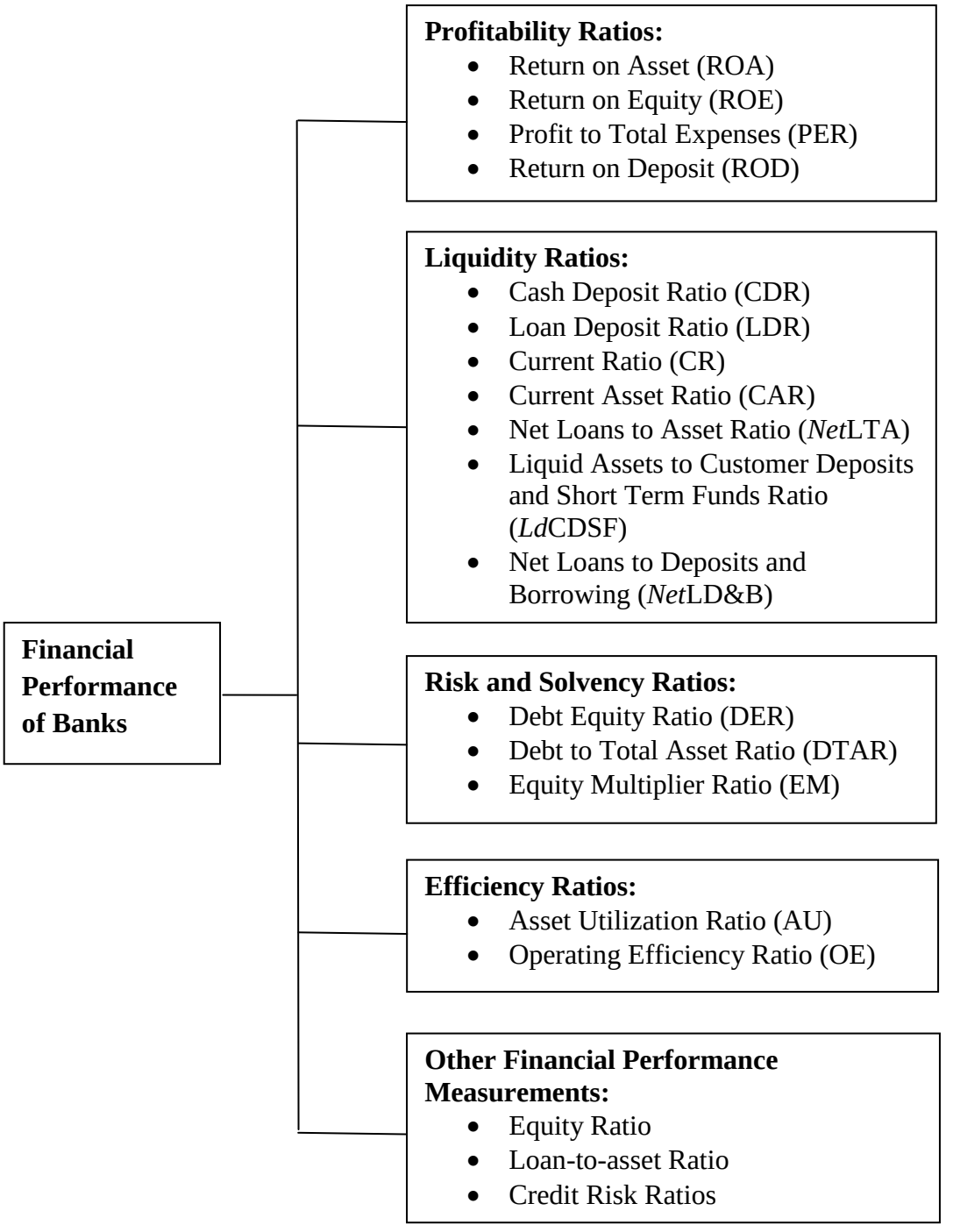
2.1 Theoretical Framework

This section presents a framework to be a guide line of theoretical elements for the empirical analysis of this study. Some literatures from other researchers had provided the analytic framework; consequently a few important financial ratios from them will be used in this study. Widagdo and Ika (2008) used four types of financial ratios which are profitability ratios, liquidity ratios, risk and solvency ratios as well as efficiency ratios to examine the comparative financial performance of Islamic banks and conventional banks in the period both before fatwa and after fatwa in

Indonesia from year 2000 to 2005. In addition, Ika and Abdullah (2011) also used the same types of ratios to compare and examine financial performance of Islamic banks against conventional banks before and after the enactment of Indonesia's Islamic Banking Act No. 21/2008. The time duration involved in this study was from year 2000 to 2007.

A summary of financial ratios used by Widagdo and Ika (2008), Ika and Abdullah (2011) and other previous researchers to investigate financial performance of banks are shown in Figure 2.1. Furthermore, the definitions, equations and explanation of these financial ratios would be discussed in the sub-sections that follow.

Figure 2.1: A summary of financial ratios used by the previous researchers to measure financial performance of banks.



Sources: Adopted from Samad and Hassan (1999), Rosly and Abu Bakar (2003), Widagdo and Ika (2008), Ika and Abdullah (2011), Ansari and Khalil-ur-Rehman, (2011), and Hanif, Tariq, Tahir and Wajeeh-ul-Momeneen (2012).

2.1.1 Profitability Ratios

Previous researchers used profitability ratios to measure the financial performance of banks in their studies. Hanif, Tariq, Tahir and Wajeeh-ul-Momeneen (2012) acknowledged that profitability was one of the widely used performance indicator to measure the performance of any business. For instance, banks earn profits when their incomes are more than their expenses. Profitability ratios depict banks overall performance and efficiency. Variables used for gauging profitability in previous studies are: return on assets (ROA), return on equity (ROE), profit to total expenses (PER), return on deposit (ROD) and cost income ratio (COSR).

2.1.1.1 Return on Assets (ROA)

Return on assets (ROA) has been used in many studies to measure the performance of banks. According to Samad and Hassan (1999), ROA shows how a bank can convert its asset into net earnings. They acknowledged that ROA can be calculated by dividing the profit after tax on the bank total assets for the respective financial year as follow:

$$ROA = \frac{profit\ after\ tax}{total\ asset}. \qquad (2.1)$$

It shows that the higher value of ROA indicates higher capability of firm. This ratio provides indicator for evaluating the managerial efficiency. ROA is an indicator for the profitability of a company relative to its company total assets. The idea of ROA is based on how well is a company generating profit from its assets. If compare

to the average ROA of the peers, a company with higher ROA means that particular company is generating profit from its asset more efficiently compare to the rest of the companies in an industry.

In addition to that, some other researchers used the profitability to measure the financial performance too, such as the studies conducted by Rosly and Abu Bakar (2003), Widagdo and Ika (2008), Ika and Abdullah (2011) and Hanif et al. (2012).

2.1.1.2 Return on Equity (ROE)

Hanif et al. (2012) indicated that return on equity (ROE) tells the return owners earn on their investment in bank. ROE is of great concern to the investors and shareholders. ROE measures the efficiency of banks in making profits from every unit of shareholders equity or bank capital. Based on Samad and Hassan (1999), Widagdo and Ika (2008), Ika and Abdullah (2011) and Hanif et al. (2012), ROE can be calculated by dividing the profit after tax on the bank equity capital for the respective financial year as follow:

$$ROE = \frac{profit\ after\ tax}{equity\ capital}. \qquad (2.2)$$

Potential investors look for ROE before investing in a bank so it is important for a bank to have a higher ROE. Higher the ROE, more efficient the banks performance is (Hanif et al., 2012).

ROE is an indicator to measures how much a company manage to generate profit from the money that shareholders invested. It can also be defined as the percentage of income returned from shareholders equity. Therefore, a company with higher ROE means that company is efficiently transform shareholders capital into earnings.

2.1.1.3 Profit to Total Expenses (PER)

Profit to total expenses (PER) was used to measure profitability of the firm with regard to its total expenses. The ratio indicates to what extend bank is efficient in controlling its operating expenses. In their researches, the ratio measures the amount of operating profit earned for each rupee of operating expenses (Samad & Hassan, 1999; Widagdo & Ika, 2008; Ika & Abdullah, 2011). The formula of PER is profit after tax divided by total expenses and it is shown below:

$$PER = \frac{profit\ after\ tax}{total\ expenses}. \qquad (2.3)$$

These previous researchers declared that a high value of this ratio shows that bank could make high profit with a given expenses. In other words, higher PER means a sufficient amount of profit is generated less expense which means that particular company is efficient in managing their cost.

2.1.1.4 Return on Deposit (ROD)

Rosly and Abu Bakar (2003) used return on deposit (ROD) to measure the percentage return on each ringgit of customer deposits. It indicates how effectively the management of a bank is able to turn deposits into net earnings. Besides that, Widagdo and Ika (2008) used this ratio to investigate the financial performance of Islamic banks in the period before and after fatwa. Return on deposit (ROD) can be calculated by divided the profit after tax on the total deposit. The equation is as follow:

$$ROD = \frac{profit\ after\ tax}{total\ deposit}. \qquad (2.4)$$

Generally, the higher the ROA, the higher should be the ROD which indicate higher return are generated with customers' deposits. It is expected that earnings will not differ in a dramatic way from loans in view of the vast similarities observed in the two systems.

2.1.2 Liquidity Ratios

The liquidity ratios compute the capability of bank to meet its short-term obligations. Generally, the higher value of liquidity ratio indicates that firm has larger margin safety to cover its short-term obligations. This was mentioned in the study of Ika and Abdullah (2011). In addition, Samad and Hassan (1999) stated that bank and other depository institutions share liquidity risk because transaction

deposits and saving accounts can be withdrawn at any time. Thus, when withdrawal exceeds new deposit significantly over a short period, banks get into liquidity trouble. There is various liquidity measures used in previous studies.

2.1.2.1 Cash Deposit Ratio (CDR)

Cash deposit ratio (CDR) is the cash in a bank vault is the most liquid asset of a bank, said by the Samad and Hassan (1999). Depositors' trust to bank is enhanced when a bank maintains a higher cash deposit ratio. Furthermore, Widagdo and Ika (2008) as well as Ika and Abdullah (2011) also used this ratio in their studies. CDR is calculated as under:

$$CDR = \frac{cash}{deposit}. \quad (2.5)$$

It explains that a higher CDR indicates that a bank is relatively more liquid than a bank which has lower CDR. With higher CDR, the cash held by the banks are sufficiently more than the deposits that customers allocated in the bank. With the higher portion of cash available, banks will be able to withstand any unusual withdrawal or any emergency cases which need large amount of cash.

2.1.2.2 Loan Deposit Ratio (LDR)

Samad and Hassan (1999) and Ika and Abdullah (2011) stated that with the low value of loan deposit ratio (LDR) the bank excesses liquidity. It also shows the

effectiveness of mediation function of bank. In the Islamic bank context, this ratio is well known also as Financing Deposit Ratio (FDR). In their studies, LDR ratio is calculated as equation below:

$$LDR = \frac{loan}{deposit}. \quad (2.6)$$

LDR appears as a sensitive ratio compare to the other indicators where an extremely high and low LDR also consider risky to a bank. A high LDR indicates that a bank might not be liquidity enough to cover any unforeseen uncertainties and a low LDR means that a bank may not have enough earnings generated from their loan business. In another word, a high LDR is risking the daily operation of a bank and a low LDR is harming the earnings of a bank.

2.1.2.3 Current Ratio (CR)

Current ratio (CR) has been used by the same researchers as mentioned above in the two liquidity ratios. Samad and Hassan (1999) mentioned that CR indicates how the bank management has been able to meet current liability that is, demand deposit with the current asset. When withdrawals significantly exceed the new deposits banks usually recourse to replace this shortage of funds by selling securities. Government securities are easily sold and are considered liquid. As such the CR as measured above is expected to be more preferable to lower current ratio. CR can be calculated as the equation below:

$$CR = \frac{current\ asset}{current\ liability}. \quad (2.7)$$

In addition, Widagdo and Ika (2008) also used this ratio in their study. They acknowledged that a high ratio is an index that shows bank has more liquid asset to pay back the trust (deposit) of the depositors. Although higher CR proves the liquidity of a bank but a lower CR or CR below 1 does not necessary means a bank would go bankrupt but it indicates that the bank are not in a good financial health which there is risk where a bank unable to pay its obligations.

2.1.2.4 Current Asset Ratio (CAR)

This ratio also used by the same researchers as the three liquidity ratios as mentioned above, such as Samad and Hassan (1999), Widagdo and Ika (2008) as well as Ika and Abdullah (2011). These previous researchers reported that current asset ratio (CAR) shows composition of firm's asset. The equation below is formula for CAR:

$$CAR = \frac{current\ asset}{total\ asset}. \quad (2.8)$$

In conclusion, the high value of CAR indicates that firm has more liquid asset than long term asset. However, a extremely high CAR does not mean a good sign to a company where high CAR come along with huge amount of account receivable, inventory, marketable securities and prepaid expenses which would be risky to a

bank when the default rate of account receivable is high and the depreciate of marketable securities.

2.1.2.5 Net Loans to Asset Ratio (*Net*LTA)

A net loan to asset ratio (*Net*LTA) was used by Hanif et al. (2012). This ratio shows the percentage of loans that are rooted in assets. The net loans to assets ratio measure the net loans outstanding as a percentage of total assets. *Net*LTA can be calculated as net loans divided by asset ratio. The equation below is the formula for *Net*LTA:

$$Net\text{LTA} = \frac{net\ loans}{asset\ ratio}. \tag{2.9}$$

The higher this ratio, lower is the banks liquidity and the bank is tied up in loans. The higher the ratio, the more risky a bank is to higher defaults. With higher loan compare to assets, banks are exposed to the risk of unable to cover the loan payment during business downturn (Hanif et al., 2012).

2.1.2.6 Liquid Assets to Customer Deposits and Short Term Funds Ratio (*Ld*CDSF)

According to Samad (2004), liquid assets to customer deposits and short term funds ratio (*Ld*CDSF) is a deposit run off ratio. This ratio shows the percentage of deposit and short term funds that are available to meet the sudden withdrawals. This

ratio can be calculated by liquid asset divided by customer deposit and short term funds (Hanif et al., 2012). The following equation is the formula for *Ld*CDSF:

$$Ld\text{CDSF} = \frac{liquid\ assets}{customer\ deposit\ and\ short\ term\ funds}. \quad (2.10)$$

It shows that the higher the *Ld*CDSF, the more liquid is bank in the case to cover sudden large amount of withdrawal. Sufficient amount of liquid asset allocated will enable banks to transform asset into cash to cover large amount of withdrawal and also any other fast cash needed circumstances.

2.1.2.7 Net Loans to Deposits and Borrowing (*Net*LD&B)

This ratio was used by the same researchers as the above ratios, which are Hanif et al., (2012). These researchers mentioned that this ratio depicts the percentage of total deposits and borrowings that are entrenched into non-liquid asset. The equation below is the formula for *Net*LD&B:

$$Net\text{LD\&}B = \frac{net\ loans}{total\ deposits\ and\ borrowing}. \quad (2.11)$$

Generally, this ratio depicts the percentage of total deposits and borrowings that are entrenched into non-liquid asset. The higher the *Net*LD&B, the higher is the chance that bank face liquidity risk.

2.1.3 Risk and Solvency Ratios

Risk and solvency ratios are one of the several tools used to measure the ability of a business to meet its long-term financial obligations. Essentially, this process calls for determining the total income generated by a business, exempting any taxes owed and any type of non-cash depreciation expenses.

2.1.3.1 Debt Equity Ratio (DER)

Based on Samad and Hassan (1999) by using this ratio, bank capital can absorb financial shock. In case asset values decrease or loans are not repaid bank capital provides protection against those loan losses. DER can be calculated as the equation below:

$$DER = \frac{debt}{equity\ capital}. \tag{2.12}$$

It explains that a lower value of DER is a good sign for a bank. In high DER, it denotes that a company or banks are aggressive in expanding their business with debt. With the high portion of debt financing in a business, interest expenses would harm the company earnings.

2.1.3.2 Debt to Total Asset Ratio (DTAR)

Both studies performed by Widagdo and Ika (2008) as well as Ika and Abdullah (2011) declared that this ratio indicates the proportion of assets financed with debt. DTAR is calculated by dividing total assets from debt and the equation is shown as below:

$$DTAR = \frac{debt}{total\ asset}. \quad (2.13)$$

These previous researchers said a high value of this ratio provides indication that firm involves in more risky business. Same as DER, high DTAR indicates that a firm are aggressive in expand its business through debt financing. A high DTAR means a company are exposed to risk for fail to pay back the debt even with the company's asset are liquidities.

2.1.3.3 Equity Multiplier (EM)

In addition, both studies presented by Widagdo and Ika (2008) as well as Ika and Abdullah (2011) also used this ratio to gauge the risk and solvency of bank performance. They declared that this ratio shows how many dollars of assets must be supported by each dollars of equity capital. The equation below is the formula for EM:

$$EM = \frac{total\ assets}{share\ capital}. \quad (2.14)$$

The equation demonstrates the higher value of this ratio indicates signal for risk failure which means banks are facing risk where banks are relying more on debts to finance its assets. High EM means total assets are sufficiently more than share capital and share capital are not sufficient to finance the assets. Banks with high EM are more risky compare to banks with low EM.

2.1.4 Efficiency Ratios

These ratios are typically used to analyze how well a company uses its assets and liabilities internally. Efficiency Ratios can calculate the turnover of receivables, the repayment of liabilities, the quantity and usage of equity and the general use of inventory and machinery.

2.1.4.1 Asset Utilization Ratio (AU)

Rosly and Abu Bakar (2003) pointed out that this ratio indicates a bank's gross yield on assets resulting from total operating income. It reflects portfolio management policies (especially the mix and yield on the bank's asset). This ratio measures capability of firm to generate revenue with its asset (Widagdo & Ika, 2008; Ika & Abdullah, 2011). This ratio can be calculated by dividing total asset from total operating income as follow:

$$AU = \frac{total\ operating\ income}{total\ asset}. \qquad (2.15)$$

The high value of this ratio indicates the high productivity of firm's asset. In high AU, a bank or a firm are generating large amount of income using certain amount of asset. Firms with high AU are fully utilised their asset in the business process.

2.1.4.2 Operating Efficiency Ratio (OE)

This ratio is the measurement of effort to maximize profitability and the value of the shareholders' investment in the institutions. It shows how well the institutions reduce operating expenses and increase productivity. This has mentioned by Rosly and Abu Bakar (2003) and they added that in an effort to maximize profitability and the value of shareholders' investment in a bank, many banking organizations recognize the need for greater efficiency in their operations. This simply means reducing operating expenses and increasing the productivity of their employees through the use of automated equipment and improved employee training. Additionally, this ratio also used by Widagdo and Ika (2008) as well as Ika and Abdullah (2011). Operating efficiency ratio (OE) is total operating expenses divided by total operating income. This equation is shown as below:

$$OE = \frac{total\ operating\ expenses}{total\ operating\ income}. \tag{2.16}$$

The smaller value of the ratio the greater the organization's ability to generate profit if revenues decrease. Smaller OE means a firms are cost effective in generating income, only small portion of expenses are needed to generate certain

amount of operating income. When using this ratio, however, investors should be aware that it does not take debt repayment or expansion into account.

2.1.5 Other Financial Performance Measurements

Some other previous researchers used other financial performance measurements to gauge the bank performance between Islamic banks and conventional banks. They are equity ratio, credit risk ratios, size and loan.

2.1.5.1 Equity Ratio

This equity ratio is used in a multiple regression model and acted as one of the explanatory variables in order to compare the financial performance of Islamic banks and conventional banks (Ansari & Khalil-ur-Rehman, 2011). The equation below is the formula for equity ratio:

$$Equity\ Ratio = \frac{total\ equity}{total\ assets}. \qquad (2.17)$$

The above equation explains that the higher the equity ratio the more capitalized of the bank is. In high equity ratio, more equities are used to finance the assets of a company compare to debt financing. However, a lower equity ratio would benefit to shareholders as the rate of return on asset would be greater than the interest rate from debt financing.

2.1.5.2 Loan-to-asset Ratio

Loan-to-asset ratio also played a role as an explanatory variable in a multiple regression model so as to compare the financial performance of Islamic banks and conventional banks (Ansari & Khalil-ur-Rehman, 2011). Loan ratio is calculated by dividing total assets from total loans and the equation is shown as below:

$$Loan\ Ratio = \frac{total\ loan}{total\ assets}. \quad (2.18)$$

The higher loans-to-asset ratio tends to exhibit higher efficiency levels which means in lower loan to asset ratio, certain amount of asset can generate higher loan business in a bank. Higher loan also indicates that higher interest income will be received by banks.

2.1.5.3 Credit Risk Ratios

Credit risk is defined by State of Pakistan as "Credit risk arises from the potential that an obligor is either unwilling to perform on an obligation or its ability to perform such obligation is impaired resulting in economic loss to the bank." Hence, credit risk is the risk of losses that arise from a borrower's or counterparty's inability to meet its obligations. There are three ratios to gauge the banks' performance for credit risk ratios, such as common equity to total assets ratio, total equity to net loans ratio and impaired loans to gross loans ratio (Hanif et al., 2012).

Common equity to total assets (EQTA) ratio provides percentage protection required to meet the expense by banks to its investment in asset. It shows the overall shock captivating capacity of a bank for possible expected or unpredicted loan asset losses. Below is the formula for common equity to total assets ratio:

$$EQTA = \frac{common\ equity}{assets}. \tag{2.19}$$

It illustrates that the higher the EQTA the higher is the capacity of absorbing asset losses for a bank. In other words, EQTA indicates the losses of a bank can withstand before shareholders equity is being consumed. The left over portion after EQTA ration indicates the remaining asset are purchased through load and needed to be repaid.

Next, total equity to net loans (EQL) also used by the same previous researchers. It shows the total equity capital as a percentage of total net loans. EQL provides equity as a cushion to take in or adjust loan losses faced by a bank. Equation below is the formula for total equity to net loans:

$$EQL = \frac{total\ equity}{net\ loans}. \tag{2.20}$$

The ratio shows the higher the ratio of EQL, the higher is the capacity for a bank in absorbing loan losses. Based on the equation above, higher EQL indicates total equity are sufficiently higher than net loan therefore in the case of business

downturn, firms will be able to use the equity to cover the loan if the business profits are not sufficient.

A last, impaired loan to gross loans (IMLGL) ratio was used to indicate the percentage of nonperforming loans or doubtful loans to gross loans that a bank has on its books. This ratio also assesses the quality of assets or loans of the bank. Equation below is the formula for IMLGL:

$$IMLGL = \frac{impaired\ loans}{gross\ loans}. \quad (2.21)$$

The equation above reveals the lower the ratio of IMLGL the better is the asset or credit performance of the bank. A lower IMLGL indicates that the impaired loans are lower compare to gross loans which is a sign of good financial health as the load than are collectable are more than doubtful loan.

2.2 Empirical Testing Procedures

2.2.1 Descriptive Statistics

Descriptive statistics is a set of brief descriptive coefficients that summarizes a given data set, which can either be a representation of the entire population or a sample. The measures used to describe the data set are measures of central tendency and measures of variability or dispersion. Measures of central tendency include the mean, median and mode, while measures of variability include the standard deviation, the minimum and maximum variables.

The mean is a particularly informative measure of the "central tendency" of the variables. The minimum value is referring to the lower value of the variables while the maximum values refer to the highest value of the variables in the ratios. The standard deviation used to measure of variability or diversity used in financial performance measures. Descriptive statistics has used by Sufian (2010) and Ansari and Khalil-ur-Rehman (2011) to achieve their objectives respectively by denoting the result both of measures of central tendency and variability or dispersion.

2.2.2 Ordinary Least Square (OLS)

The ordinary least square (OLS) is defined as a method for determining the best value of an unknown quantity relating one or more sets of observations or measurements. It also minimizes the sum of the squared deviations between a dependent variable and one or more independent variables. Previous studies used the OLS regression to measure banks' performance. Pratomo and Ismail (2006), Sufian (2010) and Ansari and Khalil-ur-Rehman (2011) used OLS regression to conduct their studies.

After the model and results are regressed and obtained respectively, the test explained in terms of descriptive statistics which explained in previous section, *t*-test of individual significance, independence sample of *t*-test, correlation coefficient and Mann-Whitney-Wilcoxon test.

Sufian (2010) used a linear regression model with panel data to test the relationship between profitability of Islamic banks and the internal and external determinants. The model is shown in the following form:

$$Y_{jt} = \delta_t + \alpha'_{jt} X_{ijt} + \alpha'_{it} X_{ejt} + \varepsilon_{jt}\,, \qquad (2.22)$$

where j = an individual Islamic bank;

t = year;

Y_{jt} = ROA of Islamic bank j in a particular year t;

X_i = internal factors (determinants) of an Islamic bank;

X_e = external factors (determinants) of an Islamic bank; and

ε_{jt} = normally distributed random variable disturbance term.

Once the linear regression model is computed, least square method of fixed effects model (FEM) is applied to control for bank-specific effects. Then, a summary statistics which include mean, minimum, maximum and standard deviation of variables used in the regression analysis is presented. This is followed by a Spearman rank-correlation coefficient is used in order to show the degree of correlation between the explanatory variables used in the multivariate regression analysis. After that, a series of parametric (*t*-test) and non-parametric (Mann-Whitney (Wilcoxon) and Kolmogorov-Smirnov) tests are also conducted in the study of Sufian (2010). The details of each test will be explained further in the following sections.

Another study performed by Ansari and Khalil-ur-Rehman (2011) also made used of ordinary least square method to compare financial performance of existing Islamic banks and contemporary conventional banks in Pakistan. The multiple regression model is formed it is computed as under:

$$ROA = \beta_0 + \beta_1 T.Assets + \beta_2 \frac{T.Equity}{T.Assets} + \beta_3 \frac{T.Liability}{T.Assets} + \beta_4 \frac{Deposits}{T.Assets} + \beta_5 \frac{Total\ Expense}{T.Assets} + \beta_6 \frac{Non\ Interest\ Expense}{Total\ Expense} + \varepsilon. \quad (2.23)$$

After the model is computed it is then presented followed by the test of descriptive statistics, correlation matrix and F-statistics are used to analyse the impact of explanatory variables. Descriptive statistics in the study showed the mean, median, minimum, maximum and standard deviation of both banks. The purpose of having correlation matrix is the same as previous researcher, Sufian (2010) which is to test the degree of correlation between the explanatory variables. The only difference between the study of Ansari and Khalil-ur-Rehman (2011) as well as Sufian (2010) is that, F-statistics is used in the study of Sufian (2010) while the other study did not. F-statistics is used in the study of Sufian (2010) because it contains more than two samples, thus, *t*-test is replaced by F-statistics. The details of F-statistics will be discussed in the following sections.

In 1908, W. S. Gosset developed the sampling distribution of the *t*-test because he was writing under the pen name "Student," the statistic is often called Student's t (Glenberg, 1988, p. 236).

In the study of Sufian (2010), *t*-test of individual significance was used with a parametric series and it is formed whenever a statistic that has simple linear regression model is $y = \beta_o + \beta_1 x + \varepsilon$. If x and y are linearly related, $\beta_1 \neq 0$. The intention of *t*-test is to see whether we can conclude that $\beta_1 \neq 0$ where $H_o: \beta_1 = 0$ and $H_a: \beta_1 \neq 0$. If H_o is rejected then $\beta_1 \neq 0$ and hence one can conclude that there is a statistically relationship between the two variables. Nevertheless, if H_o cannot be rejected, a conclusion of a significant relationship exists cannot be made because of the insufficient evidence (Anderson, Sweeney & Williams, 2011, p. 569-570). The *t*-test can be calculated under as:

$$t = \frac{b_1}{s_{b_1}}, \tag{2.24}$$

where b_1= the slope of the estimated regression equation $y = \beta_o + \beta_1 x + \varepsilon$; and

s_{b_1}= estimated standard deviation of b_1.

Two type of rejection rules fall under *t*-test. *P*-value approach is to reject H_o if *p*-value $\leq \propto$, where, $\propto$ is the critical value. Another is critical value approach which reject H_o if $t \leq -t_{\propto/2}$ or if $t \geq t_{\propto/2}$, where $t_{\propto/2}$ is based on a *t* distribution with *n*-2 degrees of freedom (Anderson et al., 2011, p. 569-570).

2.2.3 Independent-Samples *t*-Test

The independent-samples *t*-test procedure compares means for two groups of cases. Ideally, for this test, when one randomly takes replicate measurements from a

population he or she is collecting an independent sample. This test was applied by a few researchers in their studies to compare financial ratios in both Islamic banks and conventional banks, respectively, such as Samad and Hassan (1999), Rosly and Abu Bakar (2003), Widagdo and Ika (2008) as well as Ika and Abdullah (2011).

This test is used when the population mean and standard deviation are unknown and two separate groups are being compared. The hypotheses testing are $H_o: \mu_1 - \mu_2 = 0$ or $H_o: \mu_1 = \mu_2$ and $H_o: \mu_1 - \mu_2 \neq 0$ or $H_o: \mu_1 \neq \mu_2$. The *t*-test for independent-samples formula is shown below as:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{S_{\bar{x}_1 - \bar{x}_2}}, \qquad (2.25)$$

where $(\bar{x}_1 - \bar{x}_2)$ = average distance between the sample difference;

$(\mu_1 - \mu_2)$ = average distance between the population difference; and

$S_{\bar{x}_1 - \bar{x}_2}$ = standard error of the difference, where it can be calculated as $\sqrt{(\frac{SS_1 + SS_1}{n_1 + n_2 - 2}) + \frac{1}{n_1} + \frac{1}{n_2}}$, degrees of freedom (df) is $n_1 + n_2 - 2$.

Two type of rejection rules fall under independent-samples *t*-test. *P*-value approach is reject H_o if *p*-value $\leq \propto$, where $\propto$ is the critical value. Another is critical value approach which reject H_o if $t \leq -t_{\propto/2}$ or if $t \geq t_{\propto/2}$, where $t_{\propto/2}$ is the critical values of t with $n_1 + n_2 - 2$ df that has $\propto/2$ of the distribution greater than it (Glenberg, 1988, p. 259-267).

2.2.4 Correlation Coefficient

Correlation coefficient was used by Ansari and Rehman (2011) to measure the strength of the linear relationship between two variables, *x* and *y*. The sample correlation coefficient can be calculated as formula below:

$$r_{xy} = (\text{sign of } b_1)\sqrt{\text{Coefficient of determination}},$$

$$= (\text{sign of } b_1)\sqrt{r^2}, \qquad (2.26)$$

where b_1 = the slope of the estimated regression equation $\hat{y} = b_0 + b_1 x$.

On the other hand, Sufian (2010) used Spearman rank-correlation coefficient in his study where this test do not involve with any assumptions of normal distribution. The formula is defined as follows:

$$r_s = 1 - \frac{6\sum \mathrm{d}_i^2}{n(n^2-1)}, \qquad (2.27)$$

where n = the number of its items or individuals being ranked;

x_i= the rank of item *i* with respect to one variable;

y_i= the rank of item *i* with respect to second variable; and

$d_i = x_i - y_i$.

Interpretation of r_{xy} is exactly analogous to interpretation of r_s. First, r_{xy} is always between -1 and +1, inclusive. The sign of r_{xy} always corresponds to the sign of the slope of the regression line. The strength of the linear relationship (between the ranks) is best indicated by r_{xy}^2. A perfect linear relationship is indicated by r_{xy}^2 = 1.0, and the absence of a linear relationship is indicated by r_{xy}^2= 0.0 (Glenberg, 1988).

2.2.5 Mann-Whitney-Wilcoxon Test

Mann-Whitney-Wilcoxon (MWW) test is a non-parametric method that can be used to determine whether a difference exists in terms of financial performance between Islamic banks and conventional banks in previous studies (Sufian, 2010; Ika & Abdullah, 2011). The test was developed jointly by Mann, Whitney, and Wilcoxon (MWW) in 1947. It is sometimes called the Mann-Whitney test and sometimes the Wilcoxon rank-sum test. Both the Mann-Whitney and Wilcoxon versions of this test are equivalent (Anderson et al., 2011, p. 825-830).

Nevertheless, the only requirement of the non-parametric MWW test is that the measurement scale for the data is at least ordinal which means the order or rank of the data is meaningful. Then, instead of testing for the difference between the means of the two populations, the MWW test determines whether the locations of the two populations are identical. The hypotheses for the MWW test are as follows: H_0: the locations of the two populations are identical and H_a: the locations of the two populations are not identical (Anderson et al., 2011, p. 825-830).

2.2.6 Analysis of Variance (ANOVA)

Analysis of variance (ANOVA) is a statistical analysis tool that separates the total variability found within a data set into two components: random and systematic factors. The random factors do not have any statistical influence on the given data set, while the systematic factors do. Kouser and Saba (2012) acknowledged that *t*-test is used to compare the means of the samples but it might become unreliable in case of more than two samples. ANOVA is used in this case. If only two means are compared, the *t*-test (independent samples) will have the same results as the ANOVA. Thus, to compare more than two samples, ANOVA is performed. ANOVA test results can then be used in F-test on the significant of the regression formula overall. This method also used by Samad and Hassan (1999) and Neffati (2011).

Kouser and Saba (2012) made use of ANOVA to investigate any significant difference instead of *t*-test the reason is in the study, the researchers wanted to compare the means of conventional, mixed and Islamic banks. It contains three types sample banks, thus *t*-test is invalid in this case.

Another study presented by Samad and Hassan (1999) is to examine the performance of Malaysian Islamic bank during 1984-1997 by using ANOVA. The performance of Islamic bank is measured in three stages. In all the three stages of comparison, ANOVA is used to test the null hypothesis of the equality of means in order for the comparison more consistent and significant. So, if the estimated F-value is higher than the critical value, there is sufficient evidence to reject null hypothesis

that the means of performance of the two banks are equal, and vice versa. In other words, ANOVA supports the conclusion that the population means of the variable for the two banks are not identical.

F-test can also be used to test for significance in regression. With only one independent variable, the *F*-test will provide the same conclusion as the *t*-test, if the *t*-test indicates $\beta_1 \neq 0$ and thus a significant relationship, the *F*-test will also indicate a significant relationship. But with more than one independent variable, only the *F*-test can be used to test for an overall significant relationship (Anderson et al., 2011, p. 571-572).

The hypotheses are the same as *t*-test. If the null hypothesis $H_o: \beta_1 = 0$ is true, the sum of square (SSR) is divided by its degrees of freedom provides another independence estimate of σ^2. This estimate is called the *mean square due to regression,* or simply the *mean square regression,* and is denoted MSR (Anderson et al., 2011, p. 571-572).

In general,

$$\text{MSR} = \frac{\text{SSR}}{\text{Number of independent variables}}. \quad (2.28)$$

The *F*-test can be defined as equation below:

$$F = \frac{\text{MSR}}{\text{MSE}}, \quad (2.29)$$

where MSR = mean square regression; and

MSE = mean square error.

Two type of rejection rules fall under *t*-test. *P*-value approach is reject H_o if *p*-value $\leq \propto$, where $\propto$ is the critical value. Another is critical value approach which reject H_o if $F \geq F_{\propto}$, where $F_{\propto}$is based on an *F* distribution with 1 degree of freedom in the numerator and *n*-2 degrees of freedom in the denominator (Anderson et al., 2011, p. 571-572).

2.2.7 Data Envelopment Analysis (DEA)

Data envelopment analysis (DEA) is a non-parametric method in operations research and economics for the estimation of production frontiers. It is used to empirically measure productive efficiency of decision making units (DMUs). Non-parametric approaches have the benefit of not assuming a particular functional form/shape for the frontier; however they do not provide a general equation relating output and input. Essentially, the DEA is a linear programming formulation that defines a correspondence between multiple inputs and outputs. While this method was originally used to measure the performance of educational institutions, the DEA has been widely applied to measure the efficiency of various organizations, including banks. Previous studies used the DEA methodology to measure the financial performance of banks. Hassan, Mohamad and Bader (2009) used the DEA non-parametric efficiency approach originally by Farrell was applied to measure the efficiency of banks. One of the simplest and easiest ways to measure efficiency is:

$$Efficiency = \frac{Output}{Input}. \quad (2.30)$$

However, to measure relative efficient which involves multiple inputs and outputs was first addressed by Farrell (1957). The relative efficiency can be measured as:

$$\text{Efficiency} = \frac{\text{Weighted sum of outputs}}{\text{Weighted sum of inputs}}. \quad (2.31)$$

By using usual notations, this efficiency measure can be written as:

$$\text{Efficiency of unit j} = \frac{u_1 y_{1j} + u_2 y_{2j} + \dots}{v_1 x_{1j} + v_2 x_{2j} + \dots}, \quad (2.32)$$

where u_1= weight given to output 1;

y_{1j}= amount of output 1 from unit *j;*

v_1= weight given to input 1; and

x_{1j}= amount of input 1 to unit *j*.

A summary of the descriptive statistics of inputs and outputs as well as statistical tests of significance for all banks are regressed. The results are obtained and followed by the explanations of the tests. Some researchers also used DEA approach such as Duncan and Elliott (2004) as well as Sufian and Mohamad Noor (2009).

2.3 Empirical Evidence

This section shows the findings of studies carried out by previous researchers which categorized as different groups. This is to ensure that the findings are explained evidently.

2.3.1 Profitability Ratios

In 2008, a study of the interest prohibition and financial performance of Islamic banks with Indonesian evidence was held by Widagdo and Ika. The profitability ratios used are return on assets (ROA), return on equity (ROE), profit to total expenses (PER) and return on deposit (ROD). The objective of this study is to investigate whether the financial performance of Islamic banks in the period of 2002-2003 (before fatwa) is different from that in the period of 2004-2005 (after fatwa). Furthermore, it intends to examine the comparative financial performance of Islamic banks and conventional banks in the period both before fatwa and after fatwa. Fatwa is definitely mentioned the proscribing of interest.

Inter-temporal analysis was employed in this study to examine difference of Islamic banks' performance in the period before fatwa and after fatwa. All measures of profitability of Islamic banks other than ROD show that there is no significant difference in financial performance between period before fatwa and after fatwa. ROD is only ratio that indicates statistically difference. This indicates that the

growth of profit of Islamic banks is relatively higher than deposit fund growth in the period after fatwa.

By using inter-bank comparison, financial performance of Islamic banks was compared with financial performance of conventional banks in the period before fatwa. All profitability ratios do not show any statistically difference between Islamic banks and conventional banks in the period both before fatwa and after fatwa. This result is consistent with finding of the other studies that found no significant difference in profitability between Islamic banks and conventional banks (Samad and Hassan, 1999.; Ika and Abdullah, 2011). This result might be explained by the fact that revenues of Islamic banks were mainly obtained from financing activities that steadily increased during period 2000-2005. As result, profitability of Islamic banks did not lag behind the profitability conventional banks that also increased steadily in that period due to, particularly, the increasing interest rate.

However, Hanif et al. (2012) reported that profitability conventional banking stream is dominating in comparison of Islamic banking as assets of conventional banks are capable of yielding more return than Islamic banks, conventional banks are more efficient in generating profits from every unit of shareholders equity or bank capital, and conventional banks are more efficient in generating income per dollar cost incurred.

2.3.2 Liquidity Ratios

Samad and Hassan (1999) presented an exploratory study of the performance of Malaysian Islamic bank during 1984-1997. The various liquidity ratios used in this study are as cash deposit ratio (CDR), loan deposit ratio (LDR), current ratio (CR) and current asset ratio (CAR).

This study approached analysis of inter-temporal performance measures of the Islamic bank (Bank Islam Malaysia Berhad (BIMB) between 1984-1989 and 1990-1997. The result indicated that the maintenance of BIMB of liquidity position remained unchanged between 1984-1989 and 1990-1997. This unchanged liquidity position did not prove that BIMB will hold less liquidity in the subsequent years of operation when bank becomes matured.

Inter-bank comparison of liquidity ratio denoted BIMB maintained more liquidity than the conventional banks. This evidence showed by the liquidity position of BIMB has not changed over 13 years. All four measures of liquidity do not show statistically any significant difference. This finding is consistent with Widagdo and Ika (2008) and Ika Abdullah (2011) except for CR showed statistically difference. It denoted that the capability of Islamic banks to meet current liability with the current asset is better than conventional banks.

Another study conducted by Hanif et al. (2012) used different types of liquidity ratios to compare performance study of conventional and Islamic banking

in Pakistan. There are net loans to asset ratio (*Net*LTA), liquid assets to customer deposits and short term funds ratio (*Ld*CDSF) and net loans to deposits and borrowing (*Net*LD&B).

According to their study, overall liquidity management of conventional banking is better than Islamic banking as the Islamic banking sector shows that it was tied up in loans and had lower liquidity as compared to conventional banks. Furthermore, the conventional banks were more competent in meeting unexpected and sudden withdrawals as compared to Islamic banks.

In a nutshell, overall liquidity management of conventional banking is better than Islamic banking as the Islamic banking sector.

2.3.3 Risk and Solvency Ratios

In 2011, a comparative study of financial performance of Islamic banks and conventional banks in Indonesia was carried out by Ika and Abdullah. They compared and examined financial performance of Islamic banks and convention banks before and after the enactment of Indonesia's Islamic Banking Act No. 21/2008. This study was held in two different periods which is period of 2000-2007 and period of 2005-2007. The risk and solvency ratios used are debt equity ratio (DER), debt to total assets ratio (DTAR) and equity multiplier ratio (EM).

The finding of all measures of risk and solvency showed no significant difference in performance between Islamic banks and conventional banks both in period of 2000-2007 and 2005-2007. This finding supported the previous studies conducted by Widagdo and Ika (2008) that found the ability of Islamic banks and conventional banks to meet their long-term financial obligations are the same.

2.3.4 Efficiency Ratios

Rosly and Abu Bakar performed a study in 2003 with the title of Performance of Islamic and mainstream banks in Malaysia from year 1996 to 1999. Asset utilization ratio (AU) and operating efficiency ratio (OE) are the efficiency ratio used in this study to compare the performance of Islamic banking scheme (IBS) banks and the mainstream banks.

The finding revealed efficiency ratios of IBS banks are lower than mainstream banks. AU ratio reflected how many assets are employed as earning assets and the yields earned on these assets. So, the lower AU ratio for IBS banks indicated problem areas in marketing and convincing customers to use the new products. In addition, smaller OE of IBS banks proved that it is cost effective in generating income, only small portion of expenses are needed to generate certain amount of operating income.

Nevertheless, this result is inconsistent with Widagdo and Ika (2008) as well as Ika and Abdullah (2011) that showed no significant differences between Islamic

banks and conventional banks, which the cost effective in generating income in both Islamic banks and conventional banks are the same.

2.3.5 Other Financial Performance Measurements

A study of comparative financial performance of existing Islamic banks and contemporary conventional banks in Pakistan was presented by Ansari and Khalil-ur-Rehman in 2011. Five Islamic and five conventional banks are selected and their financial data collected from year 2005 to 2009 to analyse the financial performance of Islamic and conventional banking industry in Pakistan. Return on Assets (ROA) was used as a proxy and it is measured with other explanatory variables such as equity ratio and loan-to-asset ratio to gauge the financial performance of banking industry.

The finding of this study revealed the result of descriptive statistics for equity ratio is higher for Islamic banking system, which indicated that Islamic banking system is more capitalized than the conventional bank. However, the result showed the opposite for loan-to-asset ratio. Both the ratios showed positive relation both for Islamic and conventional banks that denoted that increase in loan increases the financial performance. In a nutshell, Islamic banking system was much superior to the conventional banking system. They had the capacity to increase their market share by generating new activities in Pakistan.

Another study conducted by Hanif et al. (2012) analyze and compare the performance of Islamic and conventional banking in Pakistan from year 2005 to 2009 and to find out which of the banking stream is performing better than the other. They used credit risk ratios such as common equity to total assets (EQTA) ratio, total equity to net loans (EQL) ratio and impaired loan to gross loans (IMLGL) ratio in their study.

The result revealed the EQTA ratio and IMLGL ratio of Islamic banking sector are better than conventional banks. This clearly proved that the Islamic banks have more capacity of absorbing assets losses as compare to conventional banks. Furthermore, the lower IMLGL ratio of Islamic banking sector indicated that the impaired loans are lower compare to gross loans which is a sign of good financial health as the load than are collectable are more than doubtful loan.

However, higher EQL ratio of conventional banking sector is more proficient in absorbing loan losses as compared to Islamic banking sector, which firms will be able to use the equity to cover the loan if the business profits are not sufficient.

As conclusion, based on the above explanation, the credit risk ratios and equity ratio of Islamic banking sector are better as compared to conventional banking sector, which equity ratio indicated that Islamic banking system is more capitalized than the conventional bank. However, the result showed the opposite for loan-to-asset ratio.

2.3.6 Ordinary Least Square (OLS)

A study conducted by Sufian (2010) used yearly data from 2001 to 2007 by using OLS method to examine the determinants of the profitability of the Malaysian Islamic banking sector.

The empirical findings of this paper suggested that overhead costs, capitalization, market share, and credit risk are negatively related to Malaysian Islamic banks' profitability. On the other hand, Islamic banks which are larger tend to be more profitable. The De Novo Islamic banks are found to be relatively less profitable than their incumbent bank counterparts, which could be attributed to the different levels of knowledge of the market between the incumbent and the De Novo Islamic banks. It could be argued that the more profitable Islamic banks will be able to offer more new products and services.

In addition, the role of technology advancement is particularly important given that Islamic banks with relatively more advanced technologies may have added advantage over its peers. Bank managements as well as policymakers will be more inclined to find ways to obtain the optimal utilization of capacities as well as making the best use of their resources to ensure that they are not wasted during the production of banking products and services.

2.3.7 Analysis of Variance (ANOVA)

Furthermore, Samad and Hassan (1999) studied a study by measuring the performance of Malaysian Islamic bank (Bank Islam Malaysia Berhad (BIMB) by using yearly data from 1984 to 1997. ANOVA is used when conducting this study.

The results show an average profit of BIMB is 21% whereas the average profit of the conventional bank was 36%. There are various reasons for lower profitability performance of BIMB. First, BIMB does not have wide scope for investment in any stock or security because of religious constraints. Second, investment in government bond is a major source of earnings. The rate of return of government bond is lower than other type's investments. Third, in order to provide the guarantee of depositors' deposits and trust, BIMB maintains more liquidity than the conventional banks.

Furthermore, it is found that BIMB is relatively less risky and more solvent than two other individual conventional banks. First, the reason for low risk of the BIMB is that its investments in government securities are much larger than the conventional banks. Second, it has more equity capital compared to assets shown by its equity multiplier. The comparison of Islamic bank and the group of eight conventional banks reveal that there is no difference in economic participation between them. ANOVA also supports this finding, as the F-value is statistically insignificant.

2.3.8 Data Envelopment Analysis (DEA)

Hassan, Mohamad and Bader (2009) used the yearly data from year 1990 to 2005 in measuring the efficiency of conventional versus Islamic banks of the Middle East. Data envelopment analysis (DEA) is used in this study. Efficiency results by using DEA are divided into three categories.

First, the efficiency results based on conventional, Islamic and all banks show that there is inefficiency in banks which means banks were slack in not fully using the resources efficiently to produce the same outputs. That is, both conventional and Islamic banking systems are better in utilising inputs more than generating optimal outputs. Perhaps, this is owing to the ability of banks' management to better control the usage of their internal resources rather than controlling the outcomes, which are normally influenced by external factors such as competition, regulations, GDP and other macroeconomics factors.

Second, size is an important factor that affects the variation in efficiency across banks. So, according to big versus small banks, the results reveal big banks are relatively more cost, revenue and profit efficient than small banks. The reason is better efficiency performance of big Islamic banks relative to their conventional counterparts could be owing to smaller differences in terms of capital size and history, and also the stiff competition among small conventional banks that affects their revenue and profits efficiency.

Third, results show based on banks' efficiency and their age. The findings indicate that old conventional banks are more cost efficient than new conventional banks. This could be owing to the advantage of scale and scope economies enjoyed by old conventional banks that are also larger in size than the new conventional banks. These advantages are enjoyed by old conventional banks because of having more assets, more experience, wider spread between the lending and borrowing rate, and enjoying better reputation and public confidence.

2.4 Concluding Remarks

In a nutshell, Chapter 2 has reviewed the literatures that are related to the financial performance of Islamic banks and conventional banks. Table 2.1 summarizes all the literatures that been reviewed during the period of the study.

Based on overall reviews that have been done, many researchers used financial ratios to measure the performance on banks. The four types of financial ratios conducted by Widagdo and Ika (2008), Ika and Abdullah (2011), are the best financial ratios which are appropriate to use in assessing the financial performance of Islamic banks and conventional banks in Malaysia. So, this study considers the four types of financial ratios to compute and compare the financial performance variables and investigate the relationship Islamic banks and conventional banks in Malaysia.

Table 2.1: Summary of literature review

	Data					
Author	**Variables**	**Country (ies)**	**Sample Period**	**Yearly/ Monthly Data**	**Methodology**	**Finding**
Ansari & Khalil-ur-Rehman (2011)	▪ Profitability (ROA) ▪ Total assets ▪ Total equity (TE/TA) ▪ Total loans (TL/TA) ▪ Deposits ratio (Deposits/TA) ▪ Total expenses (Total Exp./TA) ▪ Non-interest expense (NIExp./T.Exp)	Pakistan	2005-2009	Yearly data	▪ Descriptive Statistics ▪ Correlation Matrix ▪ Regression Analysis	▪ Total assets show negative relationship on financial performance for conventional banks and positive on Islamic banks. ▪ Total equity shows positive relation both for conventional and Islamic banks. ▪ Total loans show positive relation both for Islamic and conventional banks. ▪ Deposits ratio of Islamic banks increases the profitability more than the conventional banks. ▪ Total expenses of Islamic banks have positive impact on the financial performance. ▪ Non Interest expenses for both types of banks have positive impact. ▪ Islamic banking system is much superior to the conventional banking system.

Table 2.1: Summary of literature review (continued)

	Data					
Author	**Variables**	**Country (ies)**	**Sample Period**	**Yearly/ Monthly Data**	**Methodology**	**Finding**
Duncan & Elliott (2004)	▪ Efficiency Ratios: CRS & Scale efficiency ▪ Financial Performance Ratios: Interest Margin, Expense to Income, Return on Assets & Capital Adequacy	Australia	1994-1998	Yearly data	▪ Data Envelopment Analysis (DEA)	▪ All financial performance measures are positively correlated with customer service quality scores. ▪ The absence of a consistently positive relationship between efficiency and financial performance suggests that financial institutions that pursue improved financial performance through the single-minded pursuit of lower costs may be fundamentally misguided.

Table 2.1: Summary of literature review (continued)

	Data					
Author	**Variables**	**Country (ies)**	**Sample Period**	**Yearly/ Monthly Data**	**Methodology**	**Finding**
Hanif, Tariq, Tahir & Wajeeh-ul-Momeneen (2012)	▪ Profitability Ratios: ROA, ROE & COSR ▪ Liquidity Ratios: *Net*LTA, *Ld*CDSF & *Net*LD&B ▪ Credit Risk Ratios: EQTA, EQL, IMLGL ▪ Solvency: CAR, CA, EA, NPL, CI & LA	Pakistan	2005-2009	Yearly data	▪ Bank-o-meter	▪ Conventional banking stream performs better than Islamic banking in terms of profitability and liquidity management. ▪ Performance of Islamic banking is better than conventional banking sector in terms of credit risk management and solvency maintenance.

Table 2.1: Summary of literature review (continued)

	Data					
Author	**Variables**	**Country (ies)**	**Sample Period**	**Yearly/ Monthly Data**	**Methodology**	**Finding**
Hassan, Mohamad & Bader (2009)	▪ Total Cost ▪ Revenue ▪ Profit ▪ Labour ▪ Fixed Assets ▪ Total Funds ▪ Total Loans ▪ Other Earning Assets ▪ Off-BS Items ▪ Price of Labour ▪ Price of FA ▪ Price of Funds ▪ Price of Loans ▪ Price of OEA ▪ Price of Off-BS Items	Egypt, Bahrain, Tunisia, Jordan, Kuwait, Lebanon, Qatar, Saudi Arabia, Turkey, UAE & Yemen	1990-2005	Yearly data	▪ Nonparametric Approach: DEA	▪ No significant difference between the overall efficiency results of conventional versus Islamic banks. ▪ Banks are more efficient in using their resources compared to their ability to generate revenues and profits. ▪ Improvement is required in cost minimisation and revenue and profit maximisation in both banking systems. ▪ Size and age factor are not significantly influence the efficiency scores in both banking systems.

Table 2.1: Summary of literature review (continued)

	Data					
Author	**Variables**	**Country (ies)**	**Sample Period**	**Yearly/ Monthly Data**	**Methodology**	**Finding**
Ika & Abdullah (2011)	▪ Profitability Ratios: ROA, ROE, PER & ROD ▪ Liquidity Ratios: CDR, LDR, CR & CAR ▪ Risk & Solvency Ratios: DER, DTAR, EM & LDR ▪ Efficiency Ratios: AU & OE	Indonesia	2000-2007	Yearly data	▪ Mann-Whitney Test	▪ No major difference in financial performance between Islamic banks and conventional banks, except the liquidity ratios as represented by CR. ▪ Islamic banks are found to be more liquid than conventional banks ▪ The rest of other ratios show no statically differences.

Table 2.1: Summary of literature review (continued)

	Data					
Author	**Variables**	**Country (ies)**	**Sample Period**	**Yearly/ Monthly Data**	**Methodology**	**Finding**
Kouser & Saba (2012)	▪ Capital Adequacy ▪ Asset Quality ▪ Management Capability ▪ Earnings ▪ Liquidity	Pakistan	2006-2010	Yearly data	▪ Comparison of Means: t-test, ANOVA & Levene's Test ▪ Trend Analysis: CAMEL ratios	▪ Significant differences in the mean CAMEL ratios of conventional, mixed and pure Islamic banks. ▪ UAE Islamic banks are more profitable, less liquid, less risky and more efficient as compared to the UAE conventional banks.
Neffati, Fredj & Schalck (2011)	▪ Total Cost ▪ Input Level ▪ Output Level ▪ Inefficiency ▪ Statistical Noise	U. S.	1998-2004	Yearly data	▪ Event Study Analysis ▪ Parametric Approaches: SFA, TFA & DFA ▪ Nonparametric Approach: DEA	▪ A strong heterogeneity in the performance of bank mergers. ▪ Earnings management is more important for less efficient firms.

Table 2.1: Summary of literature review (continued)

	Data					
Author	**Variables**	**Country (ies)**	**Sample Period**	**Yearly/ Monthly Data**	**Methodology**	**Finding**
Pratomo & Ismail (2006)	▪ ROA ▪ CAP ▪ SDROE ▪ SIZE ▪ LOAN ▪ SEC ▪ HERF	Malaysia	1997-2004	Yearly data	▪ Unit Root Test ▪ Ordinary Least Square (OLS) Method ▪ Panal Data Analysis	▪ The higher leverage or a lower equity capital ratio is associated with higher profit efficiency, *ceteris paribus.* ▪ Size of bank is negatively correlated to bank's performance. ▪ A large size corporate tends to be unlevered.
Rosly & Abu Bakar (2003)	▪ ROE ▪ ROD ▪ PM ▪ AU ▪ OER ▪ NOM	Malaysia	1996-1999	Yearly data	▪ *t*-test	▪ Islamic banking scheme (IBS) banks have recorded higher return on assets (ROA) as they are able to utilize existing overheads carried by mainstream banks. ▪ The higher ROA ratio for IBS banks does not imply efficiency. ▪ Islamic banking that thrives on interest-like products (credit finance) is less likely to outshine mainstream banks on efficiency terms.

Table 2.1: Summary of literature review (continued)

	Data					
Author	**Variables**	**Country (ies)**	**Sample Period**	**Yearly/ Monthly Data**	**Methodology**	**Finding**
Samad & Hassan (1999)	▪ Profitability Ratios: ROA, ROE & PER ▪ Liquidity Ratios: CDR, LDR, CR & CAR ▪ Risk & Solvency Ratios: DER, DTAR, EM & LDR ▪ Community Involvement: LTA, GBD & MM/L	Malaysia	1984-1997	Yearly data	▪ ANOVA ▪ *t*-test ▪ *F*-test	▪ Risk and insolvency measures between 1984-89 and 1990-97 found that BIMB risk increased and it is statistically significant in debt-equity (DER) and equity multiplier (EM). ▪ Comparison of Islamic bank and a group of conventional bank indicate that Islamic bank is still less risky and more solvent measured in DER, DTAR, EM and LDR. ▪ Islamic bank's performance in community financing and participating in government project measured in GBD, LTA and MM/L does not show any statically difference between 1984-1989 and 1990-1997. ▪ The comparison of Islamic bank and the group of eight conventional banks reveal no difference in economic participation (measured by LTA) between them.

Table 2.1: Summary of literature review (continued)

	Data					
Author	**Variables**	**Country (ies)**	**Sample Period**	**Yearly/ Monthly Data**	**Methodology**	**Finding**
Sufian & Mohamad Noor (2009)	▪ Total Loans ▪ Income ▪ Investments ▪ Total Deposits ▪ Capital	16 MENA & Asian countries	2001-2006	Yearly data	▪ Nonparametric Approach: DEA	▪ MENA Islamic banks have exhibited higher mean technical efficiency relative to the Asian Islamic bank counterparts. ▪ Pure technical inefficiency outweighs scale inefficiency in both the MENA and Asian countries banking sectors. ▪ Positive relationship was found between bank efficiency and loans intensity, size, capitalization, and profitability. ▪ Banks with smaller market share and low non-performing loans ratio are more efficient.
Sufian (2010)	▪ Profitability ▪ Liquidity ▪ Size ▪ Credit Risk ▪ Efficiency ▪ Capital Strength ▪ Branch Networks	Malaysia	2001-2007	Yearly data	▪ OLS ▪ White's transformation	▪ Overhead cost is negatively related to Malaysian Islamic banks' profitability. ▪ Islamic banks are better capitalized and have a higher level of liquidity tend to be more profitable. ▪ The De Novo commercial banks are relatively less profitable than their incumbent bank peers.

Table 2.1: Summary of literature review (continued)

	Data					
Author	**Variables**	**Country (ies)**	**Sample Period**	**Yearly/ Monthly Data**	**Methodology**	**Finding**
Widagdo & Ika (2008)	▪ Profitability Ratios: ROA, ROE, PER & ROD ▪ Liquidity Ratios: CDR, LDR, CR & CAR ▪ Risk & Solvency Ratios: DER, DTAR, EM & LDR ▪ Efficiency Ratios: AU & OE	Indonesia	2000-2005	Yearly data	▪ Independent-Samples *t*-Test	▪ Financial performance comparison of Islamic banks in the period before fatwa and after fatwa was not statistically different. ▪ In the period both before fatwa and after fatwa, inter-bank analysis have indicated that there was no major difference in performance between Islamic banks and conventional banks. ▪ Financial performance of Islamic banks in Indonesia might not associate with fatwa issued by MUI, because macro economy indicator might affect the performance of Islamic banks in Indonesia.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This study attempts to (1) compute the financial performance of Islamic banks and the conventional banks in Malaysia; (2) compare the financial performance of Islamic banks and conventional banks in Malaysia; (3) determine if any relationship between the financial ratios of Islamic banks and conventional banks in Malaysia; and (4) investigate if Islamic banks have a better financial performance compared to conventional banks in Malaysia.

To accomplish these objectives, this study starts with computing the financial performance ratios. Then descriptive statistics will be displayed to show the mean, median, standard deviation, minimum and maximum of the financial ratios. Next, coefficient of variation (CV) is employed to compare the financial performance of Islamic banks and conventional banks in Malaysia. Normality test is conducted to check for normality of the data. The correlation coefficient is adopted to examine the relationship between the financial ratios in this study. Then, Mann-Whitney-Wilcoxon (MWW) test is used to investigate if Islamic banks have a better financial performance compared to conventional banks in Malaysia.

The remainder of this chapter discusses the data and methodology that will be applied. This chapter consists of four sections. Section 3.1 explains the concepts of

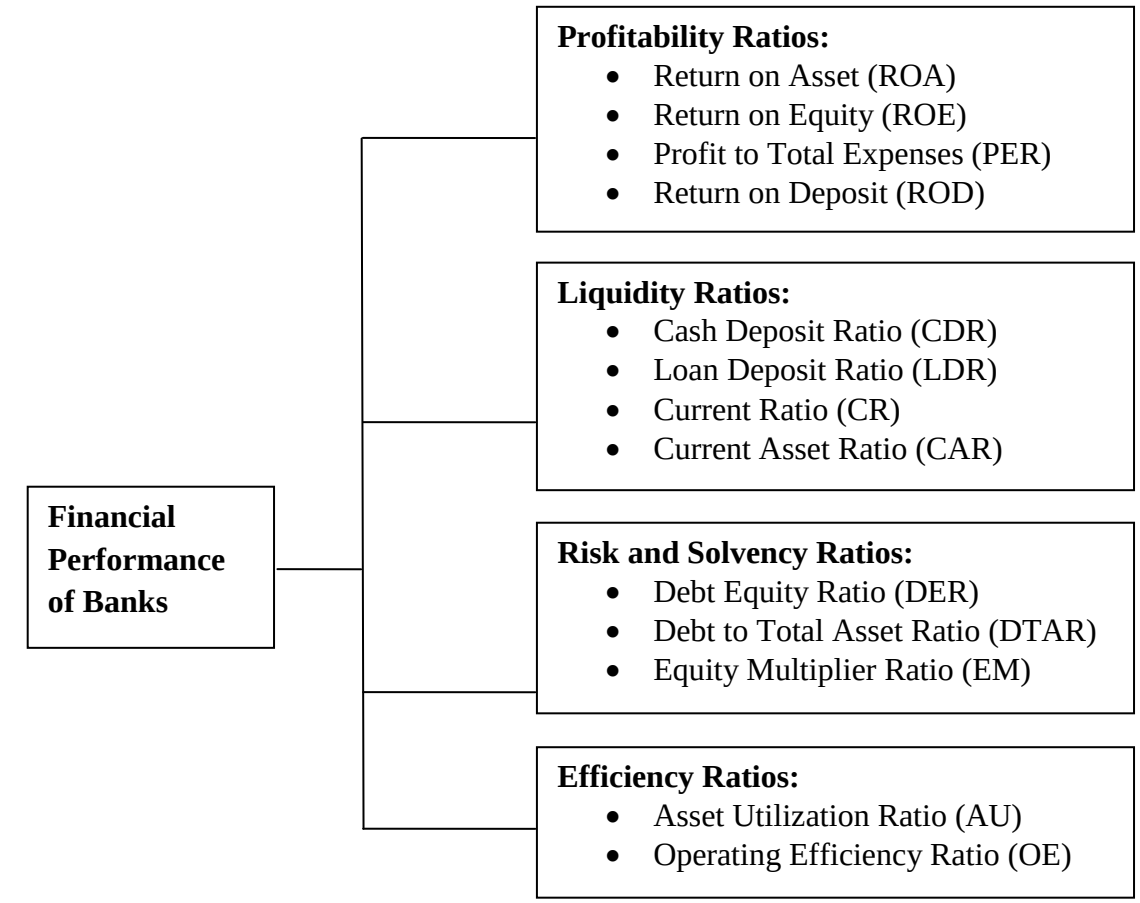
the financial performance ratios considered in this study. Section 3.2 describes the data while Section 3.3 explains the techniques of data analysis. Section 3.4 concludes this chapter.

3.1 Concepts of Financial Performance Ratios

This study adopts the financial performance measures introduced originally by Samad and Hassan (1999) and modified later by Ika and Abdullah (2011). This study investigates the financial performance of banks in Malaysia and the relationship between the four types of financial ratios chosen, that is, profitability ratios, liquidity ratios, risk and solvency ratios as well as efficiency ratios.

This study covers 15 Islamic banks and 16 conventional banks that have shown in Table 3.1 for the period from 2007 to 2011. According to study of Ika and Abdullah (2011), the 13 financial performance measures are return on asset (ROA), return on equity (ROE), profit to total expenses (PER), return on deposit (ROD), cash deposit ratio (CDR), loan deposit ratio (LDR), current ratio (CR), current asset ratio (CAR), debt equity ratio (DER), debt to total assets ratio (DTAR), equity multiplier ratio (EM), asset utilization ratio (AU) and operating efficiency ratio (OE). These ratios are summarized in Figure 3.1. The definitions and interpretations of these ratios are explained after the figure. Specifically, profitability ratios adopted in this study which are discussed in Sub-Section 3.1.1 whereas, Sub-Section 3.1.2 shows the formula of liquidity ratios and their interpretations. Risk and solvency and efficiency ratios are discussed in Sub-Section 3.1.3 and 3.1.4 respectively.

Figure 3.1: A summary of financial ratios to measure financial performance of banks.



Source: Ika and Abdullah (2011)

3.1.1 Profitability Ratios

The profitability ratios are used to assess the capability of company to generate earnings as compared to its expenses and other relevant costs incurred during certain period of time. This study uses the following ratios for measuring profitability of bank.

3.1.1.1 Return on Asset (ROA)

Return on asset (ROA) shows how a bank can convert its asset into net earnings. Based on Samad and Hassan (1999), ROA shows how a bank can convert its asset into net earnings. This ratio provides indicator for evaluating the managerial efficiency. ROA can be calculated by divided the profit after tax on the bank total assets for the respective financial year as follow:

$$\text{ROA} = \frac{profit\ after\ tax}{total\ asset}. \qquad (3.1)$$

The higher value of this ratio indicates higher capability of firm. ROA is an indicator for the profitability of a company relative to its company total assets. The idea of ROA is based on how well is a company generating profit from its assets. If compare to the average ROA of the peers, a company with higher ROA means that particular company is generating profit from its asset more efficiently compare to the rest of the companies in an industry.

3.1.1.2 Return on Equity (ROE)

This ratio indicates how bank can generate profit with the money shareholders have invested. ROE is of great concern to the investors and shareholders. ROE measures the efficiency of banks in making profits from every unit of shareholders equity or bank capital. Return on equity (ROE) can be calculated by divided the profit after tax on the equity capital. The equation is as follow:

$$\text{ROE} = \frac{profit\ after\ tax}{equity\ capital}. \tag{3.2}$$

The higher value of this ratio shows higher financial performance. ROE is an indicator to measures how much a company manage to generate profit from the money that shareholders invested. It can also be defines as the percentage of income returned from shareholders equity. Therefore, a company with higher ROE means that company is efficiently transform shareholders capital into earnings.

3.1.1.3 Profit to Total Expenses (PER)

Profit to total expenses (PER) indicates profitability of the firm with regard to its total expenses. The ratio indicates to what extend bank is efficient in controlling its operating expenses. PER can be calculated as equation below:

$$\text{PER} = \frac{profit\ after\ tax}{total\ expenses}. \tag{3.3}$$

A high value of this ratio shows that bank could make high profit with a given expenses. In other words, higher PER means a sufficient amount of profit is generated less expense which means that particular company is efficient in managing their cost.

3.1.1.4 Return on Deposit (ROD)

This ratio shows the percentage return on each Ringgit Malaysia of customers' deposit. In other words, Rosly and Abu Bakar (2003) indicated the effectiveness of bank in converting deposit into net earnings. Return on deposit (ROD) can be calculated by divided the profit after tax on the total deposit. The equation is as follow:

$$\text{ROD} = \frac{profit\ after\ tax}{total\ deposit}. \qquad (3.4)$$

Generally, the higher the ROA, the higher should be the ROD which indicate higher return are generated with customers deposits. It is expected that earnings will not differ in a dramatic way from loans in view of the vast similarities observed in the two systems.

3.1.2 Liquidity Ratios

Liquidity ratios measure the capability of bank to meet its short-term obligations. Generally, the higher value of this ratio indicates that firm has larger

margin safely to cover its short-term obligation. Among the various liquidity measures, this study uses ratios as follows.

3.1.2.1 Cash Deposit Ratio (CDR)

According to Samad and Hassan (1999), cash in a bank vault is the most liquid asset of a bank. Depositors' trust to bank is enhanced when a bank maintains a higher cash deposit ratio. CDR is calculated by cash divided by deposit. It is shown as below:

$$\text{CDR} = \frac{cash}{deposit}. \qquad (3.5)$$

It explained that a higher CDR indicates that a bank is relatively more liquid than a bank which has lower CDR. With higher CDR, the cash held by the banks are sufficiently more than then deposits that customers allocated in the bank. With the higher portion of cash available, banks will be able to withstand any unusual withdrawal or any emergency cases which need large amount of cash.

3.1.2.2 Loan Deposit Ratio (LDR)

The bank has excess liquidity which it has low value of this ratio. Loan deposit ratio (LDR) also indicates effectiveness function of bank. In the Islamic bank context, this ratio is well known also as Financing Deposit Ratio (FDR). The equation is formed as follow:

$$\text{LDR} = \frac{loan}{deposit}. \quad (3.6)$$

LDR appeared as a sensitive ratio compare to the other indicators where an extremely high and low LDR also consider risky to a bank. A high LDR indicates that a bank might not be liquidity enough to cover any unforeseen uncertainties and a low LDR means that a banks may not has enough earnings generated from their loan business. In another word, a high LDR is risking the daily operation of a bank and a low LDR is harming the earnings of a bank.

3.1.2.3 Current Ratio (CR)

Current ratio (CR) is calculated by divided current asset on current liability. This ratio shows the capability of firm to meet the current liability with the current asset. The firm is more liquid with the high value of this ratio. Below is the equation of CR.

$$\text{CR} = \frac{current\ asset}{current\ liability}. \quad (3.7)$$

A high ratio is an index that shows bank has more liquid asset to pay back the trust (deposit) of the depositors. Although higher CR proved the liquidity of a bank but a lower CR or CR below 1 does not necessary means a bank would go bankrupt but it just indicate that the bank are not in a good financial health which there is risk where a bank are not able to pay bank its obligations.

3.1.2.4 Current Asset Ratio (CAR)

Based on Ika and Abdullah (2011) study, they proposed that this ratio showed composition of firm's asset. Current asset ratio (CAR) is calculated by divided current asset on total asset as follow:

$$\text{CAR} = \frac{current\ asset}{total\ asset}. \tag{3.8}$$

The high value of CAR indicates that firm has more liquid asset than long term asset. However, a extremely high CAR does not mean a good sign to a company where high CAR come along with huge amount of account receivable, inventory, marketable securities and prepaid expenses which would be risky to a bank when the default rate of account receivable is high and the depreciate of marketable securities.

3.1.3 Risk and Solvency Ratios

A bank is solvent when the total value of its asset is greater than its liability. A bank becomes risky if it is insolvent. The following are the commonly used measures for a risk and insolvency.

3.1.3.1 Debt Equity Ratio (DER)

Bank capital can absorb financial shock. In case asset values decrease or loans are not repaid bank capital provides protection against those loan losses. Equation of DER is formed as follow:

$$\text{DER} = \frac{debt}{equity\ capital}. \tag{3.9}$$

It denotes that a lower debt equity ratio is a good sign for a bank. In high DER, it indicates that a company or banks are aggressive in expanding their business with debt. With the high portion of debt financing in a business, interest expenses would harm the company earnings.

3.1.3.2 Debt to Total Assets Ratio (DTAR)

This ratio proposes the proportion of assets financed with debt. Debit to total asset ratio (DTAR) is debt divided by total assets. It is shown as below:

$$\text{DTAR} = \frac{debt}{total\ asset}. \tag{3.10}$$

A high value of this ratio provides indication that firm involves in more risky business. Same as DER, high DTAR indicates that a firm are aggressive in expand its business through debt financing. A high DTAR means a company are exposed to risk for fail to pay back the debt even with the company's asset are liquidities.

3.1.3.3 Equity Multiplier Ratio (EM)

Equity multiplier ratio (EM) shows how many dollars of assets must be supported by each dollars of equity capital. The higher value of EM indicates signal for risk failure. The equation of EM is form as follow:

$$\text{EM} = \frac{total\ assets}{share\ capital}. \tag{3.11}$$

The equation demonstrates the higher value of this ratio indicates signal for risk failure which means banks are facing risk where banks are relying more on debts to finance its assets. High EM means total assets are sufficiently more than share capital and share capital are not sufficient to finance the assets. Banks with high EM are more risky compare to banks with low EM.

3.1.4 Efficiency Ratios

Efficiency ratios are typically used to analyze how well a company uses its assets and liabilities internally. It can calculate the turnover of receivables, the repayment of liabilities, the quantity and usage of equity and the general use of inventory and machinery. Two ratios are used for measuring efficiency of bank in this study.

3.1.4.1 Asset Utilization Ratio (AU)

Asset utilization ratio (AU) measures capability of firm to generate revenue with its asset. The high productivity of firm's asset shows it has high value of AU. This ratio can be calculated by total operating income divided by total asset as follow:

$$\mathrm{AU} = \frac{total\ operating\ income}{total\ asset}. \tag{3.12}$$

The high value of this ratio indicates the high productivity of firm's asset. In high AU, a bank or a firm are generating large amount of income using certain amount of asset. Firms with high AU are fully utilised their asset in the business process.

3.1.4.2 Operating Efficiency Ratio (OE)

This ratio measures how efficiently firm uses it assets, revenues and minimizing the expenses. In other words, it shows how well firm could reduce the expense and improves productivity. Operating efficiency ratio (OE) is total operating expenses divided by total operating income. This equation is shown as below:

$$\mathrm{OE} = \frac{total\ operating\ expenses}{total\ operating\ income}. \tag{3.13}$$

The smaller value of the ratio the greater the organization's ability to generate profit if revenues decrease. Smaller OE means a firms are cost effective in

generating income, only small portion of expenses are needed to generate certain amount of operating income. When using this ratio, however, investors should be aware that it does not take debt repayment or expansion into account.

3.2 Data Description

There are all together 16 Islamic banks and 27 conventional banks operating in Malaysia. This study only consists of 15 Islamic banks and 16 conventional banks in Malaysia due to the limitation of availability of annual reports on respective banks' websites. Analysis is performed based on cross-section data across five financial year periods (2007 to 2011). All data are obtained from the year-end balance sheets, income statements and the financial notes of the company. The samples of financial statements of banks were derived from its website and also Bursa Malaysia database which can be accessed from its website. Table 3.1 shows the 15 Islamic banks and 16 conventional banks.

Table 3.1: Summary of Banking Institutions in Malaysia

Islamic Banks	**Conventional Banks**
Affin Islamic Bank Berhad	Affin Bank Berhad
Al Rahji Banking & Investment Corporation (M) Berhad	Alliance Bank Malaysia Berhad
Alliance Islamic Bank Berhad	Bangkok Bank Berhad
Asian Finance Bank Berhad	CIMB Bank Berhad
Bank Islam Malaysia Berhad	Citibank Berhad
Bank Muamalat Malaysia Berhad	Deutsche Bank (M) Berhad
CIMB Islamic Bank Berhad	Hong Leong Bank Berhad
Hong Leong Islamic Bank Berhad	HSBC Bank Malaysia Berhad
HSBC Amanah Malaysia Berhad	Malayan Banking Berhad
Kuwait Finance House (M) Berhad	OCBC Bank (M) Berhad
Maybank Islamic Berhad	Public Bank Berhad
OCBC Al-Amin Bank Berhad	RHB Bank Berhad
Public Islamic Bank Berhad	Standard Chartered Bank Malaysia Berhad
RHB Islamic Bank Berhad	The Bank of Nova Scotia Berhad
Standard Chartered Saaqid Berhad	The Royal Bank of Scotland Berhad
	United Overseas Bank (M) Berhad

Source: Bank Negara Malaysia (2012).

3.3 Technique of Data Analysis

This section explains the methodology used in this study. They are descriptive statistics, coefficient of variation (CV), normality test, correlation coefficient, and Mann-Whitney-Wilcoxon (MWW) test.

3.3.1 Descriptive Statistics

Descriptive statistics is a set of brief descriptive coefficients that summarizes a given data set, which can either be a representation of the entire population or a sample. The measures used to describe the data set are measures of central tendency and measures of variability or dispersion. Measures of central tendency include the

mean, median and mode, while measures of variability include the standard deviation, the minimum and maximum variables.

This study uses mean, median, standard deviation, minimum and maximum, value as a basis which often used by previous studies (Sufian, 2010; Ansari & Khalil-ur-Rehman, 2011). The mean is a particularly informative measure of the "central tendency" of the variables. The median is the middle number is a sorted list of the variables. The minimum value is referring to the lower value of the variables while the maximum values refer to the highest value of the variables in the ratios. The standard deviation used to measure of variability or diversity used in financial performance measures. In this study, descriptive statistics will be computed for Islamic banks and conventional banks in order to compare the results between these two categories.

3.3.2 Coefficient of Variation

In some situations it is interesting to indicate how large the standard deviation is relative to the mean in a descriptive statistic. This measure is called the coefficient of variation (CV) and it usually expressed as a percentage (Anderson, et al., 2011, p. 95). In general, the CV is a useful statistic for comparing the variability of variables that have different standard deviations and different means. In this study, the CV allows us to compare the financial performance of Islamic banks and conventional banks in Malaysia. Besides, it allows us to determine how much volatility (risk) is assuming in comparison to the amount of return that expected from Islamic banks

and conventional banks. In other words, the lower the ratio of standard deviation to mean return, the better the financial performance of the bank is.

3.3.3 Normality Test

Shapiro and Wilk (1965) test was originally restricted for sample size of less than 50. This test was the first test that was able to detect departures from normality due to either skewness or kurtosis, or both (Althouse, Ware & Ferron, 1998). It has become the preferred test because of its good power properties (Mendes & Pala, 2003). Given an ordered random sample, $y_1 < y_2 < \ldots < y_n$, the original Shapiro-Wilk test statistic (Shapiro, 1965) is defined as,

$$W = \frac{(\sum_{i=1}^{n} a_i y_i)^2}{\sum_{i=1}^{n} (y_i - \bar{y})^2}, \tag{3.14}$$

where y_i is the i^{th} order statistic,

$\bar{y}$ is the sample mean,

$a_i = (a_1, \ldots, a_n) = \frac{m^T v^{-1}}{(m^T v^{-1} v^{-1} m)^{1/2}}$, and

$\boldsymbol{m} = (m_1, \ldots, m_n)^r$ are the expected values of the order statistics of independent and identically distributed random variable sampled from the standard normal distribution and $\boldsymbol{V}$ is the covariance matrix of those order statistics (Razali & Yap, 2011).

The value of W lies between zero and one. Small values of W lead to the rejection of normality whereas a value of one indicates normality of the data. The hypotheses for the normality test are as follow: H_0 : the variable is normally distributed and H_a : the variable is not normally distributed. The approach to determine the rejection rule for normality test is p-value approach: reject H_0 if p-value $\leq \alpha$, where α is the level of significance and taken as 0.10 in this study.

3.3.4 Correlation Coefficient

According to Anderson, et al. (2011), correlation coefficient is defined as a measure of the relationship between two variables. Correlation coefficient can be calculated using parametric (Pearson's correlation coefficient) and non-parametric methods (Spearman's correlation coefficient). Correlation coefficient is to determine if any relationship between the financial ratios of Islamic banks and conventional banks in Malaysia.

Pearson's correlation coefficient will only be tested if the financial ratios are linearly related and normally distributed. However, if the model is not linearly related then non-parametric test will be proceeding. For sample data, the Pearson's correlation coefficient is defined as follows:

$$r_{xy} = \frac{s_{xy}}{s_x s_y}, \tag{3.15}$$

where r_{xy}= sample correlation coefficient;

S_{xy}= sample covariance;

S_x= sample standard deviation of *x*; and

S_y= sample standard deviation of *y*.

Equation 3.15 shows that the Pearson's correlation coefficient for sample data (commonly referred to more simply as the sample correlation coefficient) is computed by dividing the sample covariance by the product of the sample standard deviation of *x* and the sample standard deviation of *y* (Anderson, et al., 2011, p. 114). When computed in a sample, it is designated by the letter "r" and is sometimes called "Pearson's r."

Spearman's correlation coefficient can be computed instead of the Pearson's correlation coefficient. Spearman's correlation coefficient is a correlation measure based on rank-ordered data for two variables. No assumption of normal distribution is required. The formula is defined as follows:

$$r_s = 1 - \frac{6\sum \mathrm{d}_i^2}{n(n^2-1)}, \qquad (3.16)$$

where n = the number of its items or individuals being ranked;

x_i= the rank of item *i* with respect to one variable;

y_i= the rank of item *i* with respect to second variable; and

$d_i = x_i - y_i$.

The strength of a correlation ranges from the absolute value from 1 to 0, the closer the correlation is to 1, the strong the relationship. The closer the correlation is

to 0, the weaker the relationship. The perfect negative value (-1) of the result means the variable have negatively relationship, while the positive (+1) value means the variable have a positively relationship.

The value of correlation has categorized into three groups: high, medium and low. As for high correlation: 0.5 to 1.0 for strong positive correlation while -0.5 to -1.0 for strong negative correlation. Medium correlation: 0.3 to 0.49 and -0.3 to -0.49 are medium positive correlation and medium negative correlation, respectively. Low correlation: low positive correlation is from 0.1 to 0.29 whilst low negative correlation is from -0.1 to -0.29 (Cohen, 1988). The four types of financial ratios will be tested by this test for Islamic banks and conventional banks.

Correlation		**Value**
High	Strong Positive	0.5 to 1.0
	Strong Negative	-0.5 to -1.0
Medium	Medium Positive	0.3 to 0.49
	Medium Negative	-0.3 to -0.49
Low	Low Positive	0.1 to 0.29
	Low Negative	-0.1 to -0.29

Source: Cohen (1988)

3.3.5 Mann-Whitney-Wilcoxon Test

To investigate if Islamic banks have a better financial performance compared to conventional banks in Malaysia, Mann-Whitney-Wilcoxon (MWW) test is used. The test was developed jointly by Mann, Whitney, and Wilcoxon in 1947. It is sometimes called the Mann-Whitney test and sometimes the Wilcoxon rank-sum test.

Both the Mann-Whitney and Wilcoxon versions of this test are equivalent (Anderson et al., 2011, p. 825-830).

Nevertheless, the only requirement of the non-parametric MWW test is that the measurement scale for the data is at least ordinal which means the order or rank of the data is meaningful. The hypotheses for the MWW test are as follows: H_0: the mean of both Islamic and conventional banks are the same and H_a: the mean of both Islamic and conventional banks are not the same. The approach to determine the rejection rule for MWW test is *p*-value approach: reject H_0 if *p*-value$\leq \alpha$, where α is the level of significant. In this study, $\alpha = 0.10$ is assumed.

MWW test can be applied by small-sample case or large-sample case (Anderson et al., 2011, p. 825-830). For small-sample cases, the formula is computed as follows:

$$T_{\mathrm{U}} = n_1(n_1 + n_2 + 1) - T_{\mathrm{L}} \,. \qquad (3.17)$$

Critical values of the MWW *T* statistic are provided in a table with values of T_{L} are given for cases in which both sample sizes are less than or equal to 10. In that table, n_1 refers to the sample size corresponding to the sample whose rank sum is being used in the test. The value of T_{L} is read directly from the table and the value of T_{U} is computed from Equation 3.17. On the other hand, for large-sample cases, sampling distribution of *T* for identical populations as under:

Mean: $\mu_T = {}^{1}/_{2}\, n_1(n_1 + n_2 + 1)$, (3.18)

Standard Deviation: $\sigma_T = \sqrt{{}^{1}/_{2}\, n_1 n_2(n_1 + n_2 + 1)}$, (3.19)

where $n_1 \geq 10$ and $n_2 \geq 10$.

In general, the MWW test consists of a few steps to determine if two independent random samples are selected from identical populations.

1. Rank the combined sample observations from lowest to highest, with tied values being assigned the average of the tied rankings.
2. Compute *T*, the sum of the ranks for the first sample.
3. In the large-sample case, make the test for significant differences between the two populations by using the observed value of *T* and comparing it to the sampling distribution of *T* for identical populations using equations 3.18 and 3.19. The value of the standardized test statistic *z* and the *p*-value provide the basis for deciding whether to reject H_0. In the small-sample case, a table with the values of T_L is used to find the critical values for the test (Anderson et al., 2011, p. 825-830).

In a similar study, Ika and Abdullah (2011) adopted this test to compare financial performance of Islamic banks and conventional banks in Indonesia.

3.4 Concluding Remarks

This study attempts to compare the financial performance of Islamic banks with conventional banks in Malaysia. In summary, descriptive statistics are computed for Islamic banks and conventional banks in order to compare the results between these two categories. After that, coefficient of variation (CV) is used to compare the financial performance of Islamic banks and conventional banks in Malaysia. Besides, normality test, Shapiro-Wilk Statistics is used to know either parametric (Pearson's correlation coefficient) or non-parametric methods (Spearman's correlation coefficient) is suitable for this study. Then, if the variables are normally distributed Pearson's correlation coefficient is adopted while if the variables are not normally distributed, Spearman's correlation coefficient is used to test the relationship between the variables used. In addition, Mann-Whitney-Wilcoxon (MWW) test is tested to investigate if Islamic banks have a better financial performance compared to conventional banks in Malaysia.

CHAPTER FOUR

EMPIRICAL RESULTS AND DISCUSSIONS

4.0 Introduction

This study attempts to (1) compute the financial performance of Islamic banks and the conventional banks in Malaysia; (2) compare the financial performance of Islamic banks and conventional banks in Malaysia; (3) determine if any relationship between the financial ratios of Islamic banks and conventional banks in Malaysia; and (4) investigate if Islamic banks have a better financial performance compared to conventional banks in Malaysia. To accomplish the objective of this study, descriptive statistics, coefficient of variation (CV), normality test, Spearman's correlation coefficient, and Mann-Whitney-Wilcoxon (MWW) test are utilised in this study.

In this study, the financial performances of banks in Malaysia are measured by financial performance ratios. Four types of financial ratios, that is, profitability ratios, liquidity ratios, risk and solvency ratios and efficiency ratios are calculated. These four types of financial ratios contain total of thirteen financial performance measures. They are return on asset (ROA), return on equity (ROE), profit to total expenses (PER), return on deposit (ROD), cash deposit ratio (CDR), loan deposit ratio (LDR), current ratio (CR), current asset ratio (CAR), debt equity ratio (DER), debt to total assets ratio (DTAR), equity multiplier ratio (EM), asset utilization ratio (AU) and operating efficiency ratio (OE). All of these financial performance measures are

measured by percentage. Since not all banks (16 Islamic banks and 27 conventional banks) in Malaysia are provided annual report from its companies' websites, thus the samples of this study are 15 Islamic banks and 16 conventional banks from 2007 to 2011.

Descriptive statistics are used to find out the mean, median, standard deviation, minimum and maximum of the variables used in this study. CV is a ratio of standard deviation to the mean. It is used to compare the financial performance of Islamic banks and conventional banks in Malaysia. Besides, normality test which is Shapiro-Wilk statistics is calculated in order to know either parametric (Pearson's correlation) or non-parametric methods (Spearman's correlation) is suitable for this study. Pearson's correlation will be only tested if the financial ratios are linearly related and normally distributed. Otherwise, non-parametric test will be employed. Note that most of the financial ratios are found to be not normally distributed in this study. Therefore, Spearman's correlation coefficient is estimated to show the relationship between financial ratios across Islamic banks and conventional banks in Malaysia. MWW test is used to test if Islamic banks have a better financial performance compared to conventional banks in Malaysia.

Before conducting the overall empirical results which is from year 2007 to year 2011, empirical study on yearly basis with the same methodology was being done and the empirical results are shown in Appendix A, Appendix B, Appendix C, Appendix D and Appendix E.

This chapter discusses the empirical results in two sections: empirical results and concluding remarks are given in Section 4.1 and 4.2 respectively. Sub-Section 4.1.1 discusses descriptive statistics and coefficient of variation (CV). Sub-Section 4.1.2 explains on the normality test. The results of Spearman's correlation coefficient and Mann-Whitney Wilcoxon (MWW) test are described in Sub-Section 4.1.3 and 4.1.4 respectively.

4.1 Empirical Results

4.1.1 Descriptive Statistics

The descriptive statistics measure all the mean, median, standard deviation, minimum and maximum of the financial ratios. The main purpose of descriptive statistics is used to describe the basic features of the data in this study. The mean is a particularly informative measure of the "central tendency" of the variables. The median is the middle number is a sorted list of the variables. The minimum value is referring to the lower value of the variables while the maximum values refer to the highest value of the variables in the ratios. The standard deviation used to measure of variability or diversity used in financial performance measures. The results of this test are shown in Table 4.1 and 4.2 for Islamic banks and conventional banks respectively.

4.1.1.1 Islamic Banks

Table 4.1: Descriptive Statistics for Islamic Banks

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0198	0.0056	0.1214	-0.0569	1.0000	6.1183
	ROE	0.4690	0.1472	0.9764	-0.2548	5.6550	2.0819
	PER	0.1610	0.4924	3.3448	-26.0000	4.2472	20.7733
	ROD	0.0079	0.0083	0.0278	-0.1223	0.1667	3.5228
Liquidity Ratios (%)	CDR	0.4441	0.3403	0.3399	0.0271	1.7760	0.7654
	LDR	0.8005	0.7461	0.3445	0.1096	1.7724	0.4304
	CR	1.1238	1.1091	0.0868	0.8708	1.4695	0.0773
	CAR	4.0944	0.9898	25.6120	0.8305	212.1900	6.2553
Risk & Solvency Ratios (%)	DER	54.7541	21.1616	92.2073	0.0006	560.2763	1.6840
	DTAR	3.4916	0.9240	21.4052	0.0005	177.4051	6.1305
	EM	59.0146	22.8827	98.9039	0.0253	596.0937	1.6759
Efficiency Ratios (%)	AU	0.0933	0.0249	0.5485	0.0008	4.5479	5.8803
	OE	1.2721	0.4526	5.2682	0.0487	43.7204	4.1415

For the profitability ratios of Islamic banks, the highest value of ROA is 1.0000% while the lowest value is -0.0569%. ROA has mean value of 0.0198%, its median is 0.0056% and its standard deviation is 0.1214%. For the ROE, the maximum and the minimum values are 5.6550% and -0.2548% respectively. ROE has mean value of 0.4690%, its median is 0.1472% and its standard deviation is 0.9764%. The highest value of PER is 4.2472% and the lowest value is -26.0000%. PER has mean value of 0.1610%, its median is 0.4924% and its standard deviation is 3.3448%. For the ROD, the highest and lowest values are 0.1667% and -0.1223%, respectively. ROD has mean value of 0.0079%, its median is 0.0083% and its standard deviation is 0.0278%.

For the liquidity ratios, the highest value of CDR is 1.7760% whilst the lowest value is 0.0271%. CDR has mean value of 0.4441%, its median is 0.3403% and its standard deviation is 0.3399%. LDR has the maximum value of 1.7724% whereas its minimum value is 0.1096%. LDR has mean value of 0.8005%, its median is 0.7461% and its standard deviation is 0.3445%. The highest and lowest values of CR are 1.4695% and 0.8708%. CR has mean value of 1.1238%, its median is 1.1091% and its standard deviation is 0.0868%. The highest value of CAR is 212.1900% while the lowest value is 0.8305%. The mean, median and standard deviation of CAR are 4.0944%, 0.9898% and 25.6120%, respectively.

For DER of risk and solvency ratios, the highest and lowest values are 560.2763% and 0.0006%, respectively. DER has mean value of 54.7541%, its median is 21.1616% and its standard deviation is 92.2073%. The highest value of DTAR is 177.4051% whilst the lowest value is 0.0005% DTAR has mean value of 3.4916%, its median is 0.9240% and its standard deviation is 21.4052%. EM has the highest value of 596.0937% and the lowest value is 0.0253%. The mean, median and standard deviation of EM are 59.0146%, 22.8827% and 98.0939%, respectively.

For the efficiency ratios, the highest and lowest values of AU are 4.5479% and 0.0008% respectively. AU has mean value of 0.0933%, its median is 0.0249% and its standard deviation is 0.5485%. While for the OE, the highest and lowest values are 43.720% and 0.0487% respectively. OE has the mean value of 1.2721%, its median is 0.4526% and its standard deviation is 5.2682%.

4.1.1.2 Conventional Banks

Table 4.2: Descriptive Statistics for Conventional Banks

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0107	0.0114	0.0044	-0.0014	0.0189	0.4134
	ROE	1.4849	0.5578	2.0584	-0.0468	8.3587	1.3862
	PER	0.3553	0.3602	0.1721	-0.0462	0.8491	0.4844
	ROD	0.0169	0.0160	0.0101	-0.0041	0.0571	0.5974
Liquidity Ratios (%)	CDR	0.3589	0.2395	0.4092	0.0314	3.0789	1.1401
	LDR	0.8209	0.7700	0.5274	0.0957	2.8708	0.6424
	CR	1.1454	1.1238	0.0915	1.0230	1.6347	0.0798
	CAR	0.9339	0.9747	0.2039	0.0961	2.1219	0.2183
Risk & Solvency Ratios (%)	DER	107.2772	45.2757	132.3713	4.8340	601.7271	1.2339
	DTAR	0.8891	0.9146	0.2096	0.0897	2.2824	0.2357
	EM	124.8862	49.3224	152.4156	6.7680	643.0854	1.2204
Efficiency Ratios (%)	AU	0.0169	0.0168	0.0065	0.0014	0.0386	0.3851
	OE	0.6220	0.6486	0.4235	0.0038	1.7276	0.6809

For the profitability ratios of conventional banks, ROA has the maximum and minimum values of 0.0189% and -0.0014%, respectively. ROA has mean value of 0.0107%, its median is 0.0114%, and its standard deviation is 0.0044%. The highest value of ROE is 8.3587% while the lowest value is -0.0468%. The mean of ROE is 1.4849%, its median is 0.5578% and its standard deviation is 2.0584%. The highest value of PER is 0.8491% whilst the lowest is -0.0462%. The mean, median and standard deviation of PER are 0.3553%, 0.3602% and 0.1721%, respectively. For ROD, the highest value is 0.0571% and the lowest value is -0.0041%. ROD has the mean value of 0.0169%, its median is 0.0160% and its standard deviation is 0.0101%.

For liquidity ratios, the highest and lowest values of CDR are 3.0789% and 0.0314% respectively. CDR has mean value of 0.3589%, its median is 0.2395% and

its standard deviation is 0.4092%. The highest value of LDR is 2.8708% and the lowest value is 0.0957%. LDR has mean value of 0.8209%, its median is 0.7700% and its standard deviation is 0.5274%. For the CR, the highest and lowest values are 1.6347% and 1.0230%, respectively. The mean, median and standard deviation of CR are 1.1454%, 1.1238% and 0.0915%, respectively. The highest value of CAR is 2.1219% while the lowest value is 0.0961%. CAR has mean value of 0.9339%, its median is 0.9747% and its standard deviation is 0.2039%.

The DER of the risk and solvency ratios has the highest value of 601.7271% and the lowest value is 4.8340%. DER has the mean value of 107.2772%, its median is 45.2757% and its standard deviation is 132.3713%. The highest and lowest values of DTAR are 2.2824% and 0.0897% respectively. DTAR has mean value of 0.8891%, its median is 0.9146% and its standard deviation is 0.2096%. EM has the highest value of 643.0854% while the lowest value is 6.7680%. EM has mean value of 124.8862%, its median is 49.3224% and its standard deviation is 152.4156%.

For efficiency ratios, the highest value of AU is 0.0386% whereas the lowest value is 0.0014%. AU has mean value of 0.0169%, its median is 0.0168% and its standard deviation is 0.0065%. The highest value of OE is 1.7276% while the lowest value is 0.0038%. OE has mean value of 0.6220%, its median is 0.6486% and its standard deviation is 0.4235%.

4.1.1.3 Comparison between Islamic Banks and Conventional Banks

To compare the financial performance of Islamic banks and conventional banks in Malaysia, the coefficient of variation (CV) is revealed and it is summarized in Table 4.3. For ROA, the CV of Islamic banks is 6.1183% while the CV of conventional banks is 0.4134% which is lower than the Islamic banks. Thus, the ROA of Islamic banks underperformed compared to conventional banks. The reason is for 1% expected return of Islamic banks is 6.1183% of risk on average while the risk of conventional banks is 0.4134% for 1% expected return. For ROE, the CV of Islamic banks is 2.0819% which is higher than the CV of conventional banks, 1.3862%. This indicates that the financial performance of ROE of conventional banks is better. For PER, the CV of Islamic banks is 20.7733% whereas the CV of conventional banks is 0.4844%. This shows the financial performance of PER of Islamic banks underperformed compared to conventional banks. For ROD, the value of CV for Islamic banks and conventional banks are 3.5228% and 0.5974%, respectively. This shows that the financial performance of conventional banks is better.

Table 4.3: Summary of Coefficient of Variation for Islamic Banks and Conventional Banks

Variables		Coefficient of Variance (CV)	
		Islamic Banks	Conventional Banks
Profitability Ratios (%)	ROA	6.1183	**0.4134**
	ROE	2.0819	**1.3862**
	PER	20.7733	**0.4844**
	ROD	3.5228	**0.5974**
Liquidity Ratios (%)	CDR	**0.7654**	1.1401
	LDR	**0.4304**	0.6424
	CR	**0.0773**	0.0798
	CAR	6.2553	**0.2183**
Risk & Solvency Ratios (%)	DER	1.6840	**1.2339**
	DTAR	6.1305	**0.2357**
	EM	1.6759	**1.2204**
Efficiency Ratios (%)	AU	5.8803	**0.3851**
	OE	4.1415	**0.6809**

As for CDR, the CV of Islamic banks is 0.7654% while the CV of conventional banks is 1.1401%. Based on the same principle as discussed above, the smaller CV of Islamic banks means it is better in the financial performance. For LDR, the CV of Islamic banks is 0.4304% and it is lower than the CV of conventional banks, 0.6424%. This indicates that the Islamic banks achieve better financial performance as compared to conventional banks. For CR, the CV of Islamic banks is 0.0773% which is slightly lower than the CV of conventional banks that is 0.0798%. This shows that the financial performance of Islamic banks is performed significantly better than the conventional banks. For CAR, the CV of Islamic banks and conventional banks are 6.2553% and 0.2183% respectively. This implies that Islamic banks is underperformed compared to conventional banks and it reflects that for 1% expected return is 6.2553% of risk.

For risk and solvency ratios, comparing DER, the CV of Islamic banks is 1.6840%. It is smaller than the CV of conventional banks, 1.2339%. This shows that the conventional banks achieve a better financial performance. For DTAR, the Islamic banks generate a larger CV of 6.1305% while the conventional banks indicate a smaller CV of 0.2357%. This shows that Islamic banks underperformed as compared to conventional banks. For EM, the CV of Islamic banks is 1.6759% which is larger than the CV of conventional banks, 1.2204%. This shows that the conventional banks achieve a better financial performance compared to Islamic banks.

For efficiency ratios, the CV of Islamic banks for AU is 5.8803% which is higher than the CV of conventional banks of 0.3851%. The conventional banks are better in the financial performance as lower efficiency ratios means more efficient. For OE, the CV of Islamic banks is 4.1415% while the CV of conventional banks is 0.6809%, it shows conventional banks achieve better financial performance as compared to Islamic banks.

In conclusion, conventional banks achieve a better financial performance as compared to Islamic banks in terms of profitability ratios, risk and solvency ratios as well as liquidity ratios. On the other hand, Islamic banks have a better financial performance for liquidity ratios.

4.1.2 Normality Test

Before proceed to correlation analysis, normality test is first conducted in order to know either parametric (Pearson's correlation) or non-parametric methods (Spearman's correlation) is suitable for this study. Pearson's correlation will be only tested if the financial ratios are linearly related and normally distributed. Otherwise, non-parametric test will be employed. The hypotheses for the normality test are as follow: H_0: the variable is normally distributed and H_a: the variable is not normally distributed. The approach to determine the rejection rule for normality test is *p*-value approach: reject H_0 if *p*-value $\leq \alpha$, where α is the level of significance and taken as 0.10 in this study. The normality test results are given in Table 4.4.

Table 4.4: Normality Test for Islamic Banks and Conventional Banks

Variables		Islamic Banks			Conventional Banks		
		Shapiro-Wilk Statistics	p-value	Conclusion	Shapiro-Wilk Statistics	p-value	Conclusion
Profitability Ratios	ROA	0.161	0.000	Not Normal	0.953	0.005	Not Normal
	ROE	0.534	0.000	Not Normal	0.685	0.000	Not Normal
	PER	0.845	0.000	Not Normal	0.982	0.309	Normal
	ROD	0.548	0.000	Not Normal	0.824	0.000	Not Normal
Liquidity Ratios	CDR	0.790	0.000	Not Normal	0.572	0.000	Not Normal
	LDR	0.975	0.193	Normal	0.663	0.000	Not Normal
	CR	0.884	0.000	Not Normal	0.643	0.000	Not Normal
	CAR	0.102	0.000	Not Normal	0.631	0.000	Not Normal
Risk & Solvency Ratios	DER	0.564	0.000	Not Normal	0.700	0.000	Not Normal
	DTAR	0.103	0.000	Not Normal	0.571	0.000	Not Normal
	EM	0.567	0.000	Not Normal	0.708	0.000	Not Normal
Efficiency Ratios	AU	0.118	0.000	Not Normal	0.962	0.017	Not Normal
	OE	0.156	0.000	Not Normal	0.953	0.005	Not Normal

The Shapiro-Wilk statistics in Table 4.13 is valid for interpretation for small sample size as is the case in this study. For Islamic banks, the *p*-values of ROA, ROE, PER and ROD from profitability ratios are the same which is 0.000. That means these variables are smaller than the level of significance, 0.10 and these variables are not normally distributed since the null hypothesis, H_0 is rejected.

Similarly, based on the same principles as discussed above, LDR from liquidity ratios are normally distributed. Meanwhile, the remaining financial ratios such as CDR, CR, CAR, DER, DTAR, EM, AU and OE are not normally distributed. As of conventional banks, most of the financial ratios are not normally distributed except for PER from profitability ratios.

In a nutshell, as for both Islamic and conventional banks, most of the variables are not normally distributed. According to the principle as mentioned earlier, Spearman's correlation is suitable to be tested in this study which is in the next section since most of the financial ratios are not normally distributed.

4.1.3 Spearman's Correlation Coefficient

This study uses correlation analysis to investigate if there is a significant relationship between the financial performance ratios of Islamic banks and conventional banks in Malaysia. Spearman's correlation method is chosen for this study, as it does not require the assumption of normality. In fact, most of the financial ratios are not normal in this study. According to Cohen (1988), the value of

correlation has categorized into three groups: high (0.5-1.0), medium (0.3-0.49) and low (0.1-0.29). This has been discussed in previous chapter.

4.1.3.1 Profitability Ratios

The results of Spearman's correlation for profitability ratios of Islamic banks and conventional banks are shown in Table 4.5. return on asset (ROAI), return on equity (ROEI), profit to total expenses (PERI) and return on deposit (RODI) represent profitability ratios of Islamic banks whilst return on asset (ROAC), return on equity (ROEC), profit to total expenses (PERC) and return on deposit (RODC) represent profitability ratios of conventional banks.

Table 4.5: Spearman's Correlation Coefficient of Profitability Ratios for Islamic Banks and Conventional Banks (2007)

	ROAI	**ROEI**	**PERI**	**RODI**	**ROAC**	**ROEC**	**PERC**	**RODC**
ROAI	1.000	-	-	-	-	-	-	-
	[-]							
ROEI	**.671***	1.000	-	-	-	-	-	-
	[.000]	[-]						
PERI	**.779***	**.729***	1.000	-	-	-	-	-
	[.000]	**[.000]**	[-]					
RODI	**.942***	**.742***	**.755***	1.000	-	-	-	-
	[.000]	**[.000]**	**[.000]**	[-]				
ROAC	.054	.189	.111	.108	1.000	-	-	-
	[.663]	[.123]	[.366]	[.384]	[-]			
ROEC	.008	.217	.089	.089	**.750***	1.000	-	-
	[.949]	[.076]	[.469]	[.474]	**[.000]**	[-]		
PERC	.173	**.299***	**.239***	.223	**.778***	**.612***	1.000	-
	[.158]	**[.013]**	**[.049]**	[.069]	**[.000]**	**[.000]**	[-]	
RODC	.013	.124	.090	.056	**.829***	**.587***	**.699***	1.000
	[.915]	[.314]	[.468]	[.652]	**[.000]**	**[.000]**	**[.000]**	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).

p-values are given in square brackets.

Based on the results, ROAI has a significant positive correlation with ROEI, PERI and RODI at 10% significance level. The value of correlation between ROAI and ROEI, PERI and RODI are equal to 0.671, 0.779 and 0.942 respectively. It shows that ROAI has a strong positive relationship with PERI and RODI respectively.

For ROEI, it has a significant positive correlation with PERI, RODI and PERC at 10% significance level. The value of correlation between ROEI and PERI, RODI and PERC are equal to 0.729, 0.742 and 0.299 respectively. It shows that ROEI has a

strong positive relationship with PERI and RODI respectively whilst it has a low positive relationship with PERC.

For PERI, it has a significant positive correlation with both RODI and PERC at 10% significance level. The value of correlation between PERI and both RODI and PERC are at 0.755 and 0.239. It means that PERI has a strong positive relationship with RODI whereas it has a low positive relationship with PERC.

ROAC has a significant positive correlation with ROEC, PERC and RODC at 10% significance level. The value of correlation between ROAC and ROEC, PERC and RODC are equal to 0.750, 0.778 and 0.829 respectively. It shows that ROAC has a strong positive relationship with ROEC, PERC and RODC respectively.

As for ROEC, it has a significant positive correlation with both PERC and RODC at 10% significance level. The value of correlation between ROEC and both PERIC and RODC are equal to 0.612 and 0.587 respectively. It shows that ROEC has a strong positive relationship with both PERC and RODC respectively.

For PERC, it has a significant positive correlation with RODC at 10% significance level. The value of correlation between PERC and RODC is 0.699. It shows that PERC has a strong positive relationship with RODC.

Nevertheless, there has no significant relationship between the financial performance ratios across Islamic and conventional banks. The value of correlation

between ROAI and ROAC, ROEC, PERC and RODC are at 0.054, 0.008, 0.173 and 0.013 respectively. However, ROAI has no significant relationship with ROAC, ROEC, PERC and RODC at 10% significance level. Thus, it shows that ROAI has no significant relationship with ROAC, ROEC, PERC and RODC respectively.

By using the same principles as discussed above, it is found that ROEI, PERI and RODI have no significant relationship with the profitability ratios of conventional banks except that ROEI and PERI respectively have a low positive relationship with PERC. This shows that there is a relationship of the profitability ratios within Islamic banks from the perspective of ROEI and PERI. In addition, ROAC, ROEC, PERC and RODC also have no significant relationship with the profitability ratios of Islamic banks.

In a nutshell, the profitability ratios show a strong positive relationship within Islamic banks and conventional banks respectively. In contrast, few ratios show a low positive relationship between the profitability ratios across Islamic and conventional banks.

4.1.3.2 Liquidity Ratios

The results of Spearman's correlation for liquidity ratios of Islamic and conventional banks are shown in Table 4.6. Liquidity ratios of Islamic banks are cash deposit ratio (CDRI), loan deposit ratio (LDRI), current ratio (CRI), and current asset ratio (CARI) whilst liquidity ratios of conventional banks are cash deposit ratio

(CDRC), loan deposit ratio (LDRC), current ratio (CRC), and current asset ratio (CARC).

Table 4.6: Spearman's Correlation Coefficient of Liquidity Ratios for Islamic Banks Conventional Banks

	CDRI	**LDRI**	**CRI**	**CARI**	**CDRC**	**LDRC**	**CRC**	**CARC**
CDRI	1.000	-	-	-	-	-	-	-
	[-]							
LDRI	-.132	1.000	-	-	-	-	-	-
	[.287]	[-]						
CRI	.051	**.276***	1.000	-	-	-	-	-
	[.683]	**[.024]**	[-]					
CARI	**-.263***	-.135	.016	1.000	-	-	-	-
	[.031]	[.276]	[.901]	[-]				
CDRC	-.005	-.083	.058	.021	1.000	-	-	-
	[.965]	[.503]	[.642]	[.866]	[-]			
LDRC	.070	-.054	-.034	.051	**-.292***	1.000	-	-
	[.576]	[.666]	[.782]	[.682]	**[.009]**	[-]		
CRC	-.116	-.055	.113	.008	**.251***	.010	1.000	-
	[.349]	[.656]	[.362]	[.945]	**[.025]**	[.932]	[-]	
CARC	-.090	.039	.044	.135	-.082	**.233***	.108	1.000
	[.467]	[.755]	[.721]	[.271]	[.472]	**[.038]**	[.340]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

According the results, CDRI has a significant negative correlation with CARI at 10% significance level. The value of correlation between CDRI and CARI is equal to -0.263. It shows that CDRI has a low negative relationship with CARI.

As for LDRI, it shows a significant positive correlation with CRI at 10% significance level. The correlation between LDRI and CRI is at 0.276. It signifies that LDRI has a low positive relationship with CRI.

For CDRC, it has a significant negative and positive correlation with LDRC and CRC respectively at 10% significance level. The correlation between CDRC and both LDRC and CRC are equal to -0.292 and 0.251 respectively. It indicates that CDRC has a low negative relationship with LDRC whereas it has a low positive relationship with CRC.

LDRC has a significant positive correlation with CARC at 10% significance level. The correlation between LDRC and CARC is 0.233. It shows that LDRC has a low positive relationship with CARC.

Nevertheless, there has no significant relationship between the other liquidity ratios of Islamic banks and conventional banks. The value of correlation between CDRI and LDRI, CRI, CDRC, LDRC, CRC and CARC are -0.132, 0.051, -0.005, 0.070, -0.116 and -0.090 respectively. Nevertheless, CDRI has no significant relationship with LDRI, CRI, CDRC, LDRC, CRC and CARC at 10% significance level. Hence, it shows that CDRI has no significant relationship within the liquidity ratios of Islamic banks such as LDRI and CRI. Besides, it also shows no significant relationship with the liquidity ratios of conventional banks for instance, CDRC, LDRC, CRC and CARC.

Based on the same principles as discussed above, the other liquidity ratios of Islamic banks such as LDRI, CRI and CARI have no significant relationship within themselves and with the ratios of conventional banks except that LDRI has a low

positive relationship with CRI. This shows that there is a relationship of liquidity ratios within Islamic banks from the perspective of LDRI.

For liquidity ratios of conventional banks such as CDRC, LDRC, CRC and CARC have no significant relationship with the financial ratios of both Islamic banks and conventional banks, excluding CDRC which has a negative and positive relationship with LDRC and CRC respectively. Besides, LDRC has a low positive relationship with CARC. This shows that there is a relationship of liquidity ratios within conventional banks from the perspective of CDRC and LDRC.

As a conclusion, most of the liquidity ratios have no significant relationship across Islamic banks and conventional banks. However, some of the liquidity ratios show low relationships within Islamic banks and conventional banks respectively.

4.1.3.3 Risk and Solvency Ratios

The results of Spearman's correlation for risk and solvency ratios of Islamic and conventional banks are shown in Table 4.7. Risk and solvency ratios of Islamic banks are debt equity ratio (DER), debt to total assets ratio (DTAR), and equity multiplier ratio (EM), whereas risk and solvency ratios of conventional banks are debt equity ratio (DER), debt to total assets ratio (DTAR), and equity multiplier ratio (EM).

Table 4.7: Spearman's Correlation Coefficient of Risk and Solvency Ratios for Islamic Banks and Conventional Banks

	DERI	**DTARI**	**EMI**	**DERC**	**DTARC**	**EMC**
DERI	1.000	-	-	-	-	-
	[-]					
DTARI	**.547***	1.000	-	-	-	-
	[.000]	[-]				
EMI	**.998***	**.515***	1.000	-	-	-
	[.000]	**[.000]**	[-]			
DERC	.189	.020	.192	1.000	-	-
	[.123]	[.868]	[.118]	[-]		
DTARC	.191	.090	.187	**.488***	1.000	-
	[.119]	[.463]	[.128]	**[.000]**	[-]	
EMC	.205	.060	.208	**.937***	**.281***	1.000
	[.094]	[.625]	[.088]	**[.000]**	**[.012]**	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

Based on the results, DERI has a significant positive correlation with both DTARI and EMI at 10% significance level. The value of correlation between DERI and both DTARI and EMI are equal to 0.547 and 0.998. It shows that DERI has a strong positive relationship with DTARI and EMI respectively.

As for DTARI, it has a significant positive correlation with EMI at 10% significance level. The value of correlation between DTARI and EMI is equal to 0.515. It shows that DTARI has a strong positive relationship with EMI.

DERC has a significant positive correlation with DTARC and EMC respectively at 10% significance level. The value of correlation between DERC and

both DTARC and EMC are at 0.488 and 0.937 respectively. It indicates that DERC has a low and strong positive relationship with DTARC and EMC respectively.

For DTARC, it has a significant positive correlation with EMC at 10% significance level. The value of correlation between DTARC and EMC is 0.281. It shows that DTARC has a low positive relationship with EMC.

On the other hand, there has no significant relationship between the risk and solvency ratios of Islamic and conventional banks. The value of correlation between DERI and DERC, DTARC and EMC are equal to 0.189, 0.191 and 0.205 respectively. However, DERI has no significant relationship with DERC, DTARC and EMC at 10% significance level. So, it shows that DERI has no significant relationship with DERC, DTARC and EMC respectively.

By using the same principles as discussed above, it is found that DTARI and EMI have no significant relationship with the risk and solvency ratios of conventional banks. Meanwhile, DERC, DTARC and EMC also show no significant relationship with the risk and solvency ratios of Islamic banks.

In conclusion, most of the risk and solvency ratios show no significant relationship across Islamic banks and conventional banks. However, some of the ratios show a significant positive relationship within Islamic banks and conventional banks respectively.

4.1.3.4 Efficiency Ratios

The results of Spearman's correlation for profitability ratios of Islamic and conventional banks are shown in Table 4.8. Asset utilization ratio (AUI) and operating efficiency ratio (OEI) represent profitability ratios of Islamic banks while asset utilization ratio (AUC) and operating efficiency ratio (OEC) represent profitability ratios of conventional banks.

Table 4.8: Spearman's Correlation Coefficient of Efficiency Ratios for Islamic Banks and Conventional Banks

	AUI	**OEI**	**AUC**	**OEC**
AUI	1.000	-	-	-
	[-]			
OEI	**-.473***	1.000	-	-
	[.000]	[-]		
AUC	-.014	.059	1.000	-
	[.912]	[.630]	[-]	
OEC	.224	-.097	-.083	1.000
	[.067]	[.429]	[.463]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

The results show that AUI has a significant negative correlation with OEI at 10% significance level. The value of correlation between AUI and OEI is equal to -0.473. It implies that AUI has a low negative relationship with OEI.

Nevertheless, there has no significant relationship between the other efficiency ratios of Islamic banks and conventional banks. The value of correlation between AUI and both AUC and OEC are -0.014 and 0.224 respectively. However, AUI has

no significant relationship with AUC and OEC at 10% significance level. Therefore, it shows that AUC has no significant relationship with AUC and OEC respectively.

By having the same principles as discussed above, it is found that OEI, AUC and OEC have no significant relationship with each other, exclude for OEI has a low negative relationship with AUI. This shows that there is a relationship between the efficiency ratios within Islamic banks.

In a nutshell, there is no significant relationship between the financial performance ratios of both Islamic and conventional banks for efficiency ratios, excluding OEI which has a low negative relationship with AUI.

4.1.4 Mann-Whitney-Wilcoxon Test

To determine if a difference exists between financial performance of Islamic banks and conventional banks, Mann-Whitney-Wilcoxon (MWW) test is used. The hypotheses for the MWW test are as follow: H_0: the mean of both Islamic and conventional banks are the same, and H_a: the mean of both Islamic and conventional banks are not the same. The approach to determine the rejection rule for MWW test is p-value approach: reject H_0 if p-value$\leq \alpha$, where α is the level of significant. In this study, $\alpha = 0.10$ is assumed.

Table 4.9: Mann-Whitney Wilcoxon (MWW) Test

Variables		*z*-value	*p*-value
Profitability Ratios	ROA	-5.089	**0.000**
	ROE	-5.548	**0.000**
	PER	-2.505	**0.012**
	ROD	-5.537	**0.000**
Liquidity Ratios	CDR	-3.117	**0.002**
	LDR	-0.436	0.663
	CR	-2.083	**0.037**
	CAR	-5.169	**0.000**
Risk & Solvency	DER	-4.344	**0.000**
	DTAR	-1.787	**0.074**
	EM	-4.633	**0.000**
Efficiency	AU	-4.311	**0.000**
	OE	-0.927	0.354

Note: 10% level of significance is used.

Based on the results of Mann-Whitney Wilcoxon (MWW) test in Table 4.9, the *p*-values of ROA, ROE, PER and ROD are 0.000, 0.000, 0.012 and 0.000 respectively. Since these *p*-values are smaller than the significance level of 0.10, the null hypothesis, H_0 are rejected. It implies that the means for ROA, ROE, PER and ROD of Islamic and conventional banks are significantly different. Based on Table 4.3, the coefficient of variation (CV) of ROA, ROE, PER and ROD of Islamic banks are larger. Thus, the financial performance of Islamic banks significantly underperformed as compared to conventional banks on profitability ratios.

For the liquidity ratios, the *p*-value of LDR is 0.663 which is larger than the significance level of 0.10. So, the null hypothesis H_0 is not rejected. Thus, it can be concluded that the mean of both Islamic and conventional banks are the same. On the other hand, the *p*-values of CDR, CR, and CAR are 0.002, 0.037 and 0.000 respectively. The null hypothesis, H_0 are rejected due to the smaller *p*-values of these

ratios as compared to the significance level of 0.10. Thus, it can be concluded that the mean of both Islamic and conventional banks are significantly different. According to Table 4.3, the CV for CDR and CR of Islamic banks is smaller, whereas the CV for CAR of conventional banks is smaller. Therefore, it can be concluded that the financial performance of both Islamic and conventional banks is indecisive based on liquidity ratios. The reason is CDR and CR of Islamic banks show a better financial performance while CAR of conventional banks shows a better financial performance.

The *p*-values of three risk and solvency ratios, DER, DTAR and EM are 0.000, 0.074 and 0.001 respectively. These three *p*-values are smaller than the significant level of 0.10. Thus, the null hypotheses H_0 are rejected. It indicates that the mean of both Islamic and conventional banks are significantly different for risk and solvency ratios. Based on the Table 4.3, it shows that the conventional banks have a better financial performance based on risk and solvency ratios.

The AU of efficiency ratios shows the *p*-value of 0.000 which is smaller than the significant level of 0.10. The null hypothesis H_0 is rejected. Therefore, the mean of both Islamic and conventional banks are significantly not the same for AU. Meanwhile, the *p*-value of OE is 0.354 which is larger than the significant level of 0.10, where the null hypothesis, H_0 is not rejected. It means that the mean of both Islamic and conventional banks are the same. According to Table 4.3, it shows that CV of AU of conventional banks achieves better financial performance in terms of efficiency ratios.

As a conclusion, conventional banks achieve better financial performance in terms of profitability ratios, risk and solvency ratios as well as efficiency ratios. As of liquidity ratios, both Islamic and conventional banks show an indecisive outcome on the financial performance.

4.2 Discussion and Concluding Remarks

The major finding of this study is Islamic Banks performed significantly better than conventional banks only in terms of liquidity ratios which is evident from CDR, LDR and CR. Nevertheless, Islamic banks significantly underperformed in other aspects including profitability ratios (ROA, ROE, PER and ROD), risk and solvency ratios (DER, DTAR and EM) as well as efficiency ratios (AU and OE).

The finding of this study is consistent with previous study (Samad and Hassan, 1999) that Islamic banks significantly underperformed in terms of profitability ratios. The Samad and Hassan (1999) study of the performance of Malaysian Islamic banks during 1984-1997 with the reasons of Bank Islam Malaysia Berhad's business has expanded over the years and number of branches increased to 75 in 1998. According to Samad and Hassan (1999), the reason for lower profitability of Islamic banks is that these banks do not have wide scope for investment in any stock or security because of religious constraints. It can only invest in *Shariah* approved projects. It cannot invest beyond the *Shariah* Board approved investment even if it can earn higher rate of returns.

Furthermore, the finding is also consistent with previous researchers (Widagdo & Ika, 2008; Ika & Abdullah, 2011), where Islamic banks are found to be more liquid than conventional banks in Indonesia. Statistically, it seems that the capability of Islamic banks to meet its short-term obligations is better than conventional banks. The reason for this might be related to dominant form of Islamic banks financing that is short term nature. Like other countries, financing of Islamic banks in Indonesia have been dominated by *Murabahah* receivables. Besides, liquidity ratios are more popular and their short terms nature and low risk investment for bank. Islamic banks are required to maintain high liquid (Widagdo & Ika, 2008; Ika & Abdullah, 2011).

Nevertheless, the finding of risk and solvency ratios in this study is contrary with preceding study (Samad and Hassan, 1999) that Islamic performed significantly. One of the reasons for higher risk of Islamic banks is that its investments in government securities are much smaller than the conventional banks. As investments in government securities are less risky conventional banks face lower risk. Next, smaller equity capital indicates a lower shock absorbing capacity for Islamic banks. It cannot withstand more assets or loan losses compared to banks which have less capital (Samad and Hassan, 1999).

Additionally, the finding of underperformed of efficiency ratios of Islamic bank shows contrary with the study of Ika and Abdullah (2011). In general, lacking on diversification by promoting ethical banking via partnership arrangements such as trustee partnership (*mudarabah*) and joint ventures (*musyarakah*) was led to less efficient of Islamic banks.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.0 Introduction

This study has been carried out with the purpose to compare the financial performance of Islamic banks in Malaysia with those of conventional banks which have longer history of establishment in Malaysia. To be more specific, this study computes and compares the financial performance of Islamic banks and conventional banks in Malaysia. Besides, this study also determine if any relationship between the financial ratios of Islamic banks and conventional banks in Malaysia. In addition, this study also investigates if Islamic banks have a better financial performance compared to conventional banks in Malaysia.

This study covers 15 Islamic banks and 16 conventional banks for the period from 2007 to 2011. Following Ika and Abdullah (2011), thirteen financial performance measures are computed in this study. They are return on asset (ROA), return on equity (ROE), profit to total expenses (PER), return on deposit (ROD), cash deposit ratio (CDR), loan deposit ratio (LDR), current ratio (CR), current asset ratio (CAR), debt equity ratio (DER), debt to total assets ratio (DTAR), equity multiplier ratio (EM), asset utilization ratio (AU) and operating efficiency ratio (OE).

This chapter is organised as follows: Section 5.1 discusses the findings of this study; Section 5.2 provides policy implications; Section 5.3 provides limitations of

study. Recommendations for future study and concluding remarks of this study are given in Section 5.4 and 5.5 respectively.

5.1 Summary of Findings

The coefficient of variation (CV) findings suggest that Islamic banks performed significantly better than conventional banks only in terms of liquidity ratios (CDR, LDR, and CR). Nonetheless, Islamic banks significantly underperformed in other aspects including profitability ratios (ROA, ROE, PER and ROD), risk and solvency ratios (DER, DTAR, and EM) as well as efficiency ratios (AU and OE).

For the normality test, Shapiro-Wilk statistics indicated that most of the financial ratios of Islamic banks and conventional banks are not normally distributed, excluding LDR from liquidity ratios of Islamic and PER from profitability ratios of conventional banks are normally distributed.

Since most of the financial ratios are not normally distributed, Spearman's correlation coefficient is chosen in this study. The results of Spearman's correlation coefficient suggest that there is no significant relationship between financial ratios across Islamic and conventional banks in Malaysia for liquidity ratios, efficiency ratios as well as risk and solvency ratios. Nevertheless, for profitability ratios, ROEI and PERI of Islamic banks respectively shows a low positive relationship with PERC of conventional banks.

Lastly, for Mann-Whitney Wilcoxon (MWW) test, it shows that Islamic banks significantly underperformed in terms of profitability ratios (ROA, ROE, PER and ROD), risk and solvency ratios (DER, DTAR, and EM) as well as efficiency ratios (AU and OE). As for liquidity ratios, both Islamic and conventional banks show an indecisive outcome on the financial performance. Therefore, it indicates that Islamic banks do not show better financial performance compared to conventional banks in Malaysia.

As a whole, the result of this study has shown that, in general, Islamic banks performed significantly better than conventional banks only in terms of liquidity ratios. Nonetheless, Islamic banks significantly underperformed in other aspects including profitability ratios, risk and solvency ratios as well as efficiency ratios. This finding is consistent with previous researchers, such as Ika and Abdullah (2011), where Islamic banks are found to be more liquid than conventional banks.

5.2 Policy Implications

The findings of this study enable Islamic banks stakeholders to understand its current financial performance. In particular, after about 30 years of development in Malaysia, Islamic banks have achieved better performance in terms of liquidity. Nonetheless, they are still lagging behind conventional banks in terms of profitability ratios, efficiency ratios, and risk and solvency ratios. Policy makers for instance government, Islamic banks' board of directors and managers should look

into this matter critically so as to catch up with the conventional banks in terms of financial performance.

A stakeholder can be defined as a party that has an interest in a company. The primary stakeholders in a typical corporation are its investors, employees, customers and suppliers. However, modern theory goes beyond this conventional concept to embrace additional stakeholders such as the community, government and trade associations. For instance, Islamic banks customers have an interest in information about the continuance of Islamic banks in Malaysia, especially when they have a long-term involvement with, or are dependent on the Islamic banks. Generally, it means that the findings enable the customers to know if their Islamic banks they dealt with are financially sound.

In addition, the significantly underperformance of Islamic banks in the aspects of profitability ratios, efficiency ratios as well as risk and solvency ratios allow shareholders to know that the credit risk of Islamic banks is high. Financial information of Islamic banks also enables shareholders to determine whether their principal investment and the dividend attaching to them, will be paid when due.

Furthermore, the significantly underperformance of Islamic banks in three aspects as mentioned above also help investors to know the solvency position of Islamic banks is relatively higher than conventional banks. The financial information of Islamic banks help them determine whether they should buy, hold or sell their shares. Besides, they analyse the financial performance of Islamic banks to know

about the safety of their investment and ability to pay dividend and repayment of principle amount on due date.

Moreover, employees gain the information about the stability and profitability of their respective companies; Islamic banks are low due to the significant underperformance of Islamic banks in three aspects as mentioned above. They are also gain the information which enables them to assess the ability of the Islamic banks to provide remuneration, retirement benefits and employment opportunities. In general, the findings enable the employees to know their jobs security.

5.3 Limitations of Study

There are all together 16 Islamic banks and 27 conventional banks operating in Malaysia. This study only consists of 15 Islamic banks and 16 conventional banks due to the limitation of availability of annual reports on respective banks' websites. This is because many banks are not providing their annual reports to the public. This made it difficult to find a company that provides a free annual report for the purpose of this research. Besides, another limitation is the time period (2007-2011) that has been covered in this study. Complete data set for before 2007 are not available due to some of the Islamic banks started their operations only since 2007. Five years of time period is consider a short period for research purpose. In addition, some of the banks have not provided annual report for 2012 yet.

5.4 Recommendations for Future Study

There are several potential avenues for future study. One of the directions can be focused on the factors of relatively poor financial performance of Islamic banks in Malaysia. Furthermore, future researchers can take into consideration of estimating equations such as ordinary least squared (OLS) regression instead of financial ratios. This can be used to investigate the impacts of determinants (dependent variable) on each type of financial performance (independent variable).

Furthermore, researchers also can compare the financial performances of Islamic banks and conventional banks in other countries in Asian such as China, India, and Indonesia and so on in terms of profitability, liquidity, risk and solvency as well as efficiency ratios. Similarly, researchers may also compare Asian and European countries' financial performances of Islamic banks in terms of profitability, liquidity, risk and solvency as well as efficiency ratios.

Additionally, pre crisis and post crisis analysis can also be studied because financial performance of Islamic banks and conventional banks may be influenced as a result of after crisis.

5.5 Concluding Remarks

This study compares the financial performance of Islamic banks in Malaysia with those of conventional banks. The research findings of the study provide

significant evidence that Islamic banks performed significantly better than conventional banks only in terms of liquidity ratios. Nonetheless, Islamic banks significantly underperformed in other aspects including profitability ratios, risk and solvency ratios as well as efficiency ratios.

Besides, the results indicate there is no significant relationship between financial ratios across Islamic and conventional banks in Malaysia for liquidity ratios, efficiency ratios as well as risk and solvency ratios. However, for profitability ratios, ROEI and PERI of Islamic banks respectively shows a low positive relationship with PERC of conventional banks. Additionally, it can be concluded that Islamic banks do not a better financial performance compared to conventional banks in Malaysia.

In a nutshell, the empirical results found in this study have resolved the problem presented. Therefore, this study has achieved the objectives set out in Chapter 1.

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APPENDIX A

Table 5.1: Descriptive Statistics for Islamic Banks (Year 2007)

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0018	0.0049	0.01371	-0.0338	0.0141	7.7436
	ROE	0.0820	0.0036	0.11719	-0.1430	0.2465	1.4284
	PER	-2.2198	0.0054	8.37891	-26.0000	1.0815	-3.7747
	ROD	0.0032	0.0054	0.01784	-0.0414	0.0173	5.5348
Liquidity Ratios (%)	CDR	0.5563	0.0072	0.35069	0.2582	1.2165	0.6304
	LDR	0.6093	0.0054	0.38791	0.1096	1.4369	0.6366
	CR	1.1432	0.0072	0.10696	1.0218	1.3741	0.0936
	CAR	0.9841	0.0062	0.01256	0.9560	1.0000	0.0128
Risk & Solvency Ratios (%)	DER	12.9054	0.0032	11.52811	0.0006	37.6964	0.8933
	DTAR	0.8032	0.0032	0.29068	0.0005	0.9624	0.3619
	EM	14.0193	0.0059	11.74503	1.0298	39.1689	0.8378
Efficiency Ratios (%)	AU	0.0242	0.0059	0.01771	0.0008	0.0552	0.7330
	OE	4.8044	0.0059	13.67887	0.0487	43.7204	2.8472

Table 5.2: Descriptive Statistics for Conventional Banks (Year 2007)

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0093	0.0100	0.0044	0.0009	0.0153	0.4765
	ROE	1.3822	0.0116	1.9807	0.0244	6.4331	1.4330
	PER	0.2597	0.0119	0.1269	0.0243	0.4273	0.4886
	ROD	0.0151	0.0121	0.0074	0.0040	0.0322	0.4883
Liquidity Ratios (%)	CDR	0.5583	0.0124	0.7350	0.0467	3.0789	1.3165
	LDR	0.8197	0.0121	0.5477	0.1621	2.6910	0.6682
	CR	1.1512	0.0124	0.1216	1.0673	1.5639	0.1056
	CAR	0.8453	0.0127	0.3619	0.5141	2.1219	0.4282
Risk & Solvency Ratios (%)	DER	98.2388	0.0124	122.7015	4.8340	393.1590	1.2490
	DTAR	0.8186	0.0121	0.4112	0.4843	2.2824	0.5023
	EM	130.8828	0.0102	170.8295	6.7680	643.0854	1.3052
Efficiency Ratios (%)	AU	0.0133	0.0076	0.0048	0.0033	0.0201	0.3601
	OE	0.7060	0.0085	0.4572	0.0633	1.6151	0.6476

APPENDIX A (continued)

Table 5.3: Summary of CV for Islamic Banks and Conventional Banks (Year 2007)

Variables		Coefficient of Variance (CV)	
		Islamic Banks	Conventional Banks
Profitability Ratios (%)	ROA	7.7436	**0.4765**
	ROE	**1.4284**	1.4330
	PER	-3.7747	**0.4886**
	ROD	5.5348	**0.4883**
Liquidity Ratios (%)	CDR	**0.6304**	1.3165
	LDR	**0.6366**	0.6682
	CR	**0.0936**	0.1056
	CAR	**0.0128**	0.4282
Risk & Solvency Ratios (%)	DER	**0.8933**	1.2490
	DTAR	**0.3619**	0.5023
	EM	**0.8378**	1.3052
Efficiency Ratios (%)	AU	0.7330	**0.3601**
	OE	2.8472	**0.6476**

Table 5.4: Normality Test for Islamic Banks and Conventional Banks (Year 2007)

Variables		Islamic Banks			Conventional Banks		
		Shapiro-Wilk Statistics	p-value	Conclusion	Shapiro-Wilk Statistics	p-value	Conclusion
Profitability Ratios	ROA	0.728	0.003	Not Normal	0.918	0.157	Normal
	ROE	0.947	0.661	Normal	0.692	0.000	Not Normal
	PER	0.883	0.171	Normal	0.904	0.094	Not Normal
	ROD	0.698	0.001	Not Normal	0.932	0.267	Normal
Liquidity Ratios	CDR	0.839	0.056	Not Normal	0.577	0.000	Not Normal
	LDR	0.919	0.382	Normal	0.655	0.000	Not Normal
	CR	0.889	0.195	Normal	0.608	0.000	Not Normal
	CAR	0.903	0.271	Normal	0.600	0.000	Not Normal
Risk & Solvency Ratios	DER	0.885	0.175	Normal	0.693	0.000	Not Normal
	DTAR	0.832	0.048	Not Normal	0.566	0.000	Not Normal
	EM	0.886	0.182	Normal	0.692	0.000	Not Normal
Efficiency Ratios	AU	0.987	0.990	Normal	0.955	0.575	Normal
	OE	0.409	0.000	Not Normal	0.948	0.460	Normal

APPENDIX A (continued)

Table 5.5: Spearman's Correlation Coefficient of Profitability Ratios for Islamic Banks and Conventional Banks (2007)

	ROAI	**ROEI**	**PERI**	**RODI**	**ROAC**	**ROEC**	**PERC**	**RODC**
ROAI	1.000	-	-	-	-	-	-	-
	[-]							
ROEI	**.867***	1.000	-	-	-	-	-	-
	[.001]	[-]						
PERI	**.891***	**.818***	1.000	-	-	-	-	-
	[.001]	**[.004]**	[-]					
RODI	**.917***	**.800***	**.800***	1.000	-	-	-	-
	[.001]	**[.010]**	**[.010]**	[-]				
ROAC	.103	-.115	-.127	.167	1.000	-	-	-
	[.777]	[.751]	[.726]	[.668]	[-]			
ROEC	.042	-.224	-.188	.083	**.886***	1.000	-	-
	[.907]	[.533]	[.603]	[.831]	**[.000]**	[-]		
PERC	-.079	-.261	-.091	-.150	**.877***	**.750***	1.000	-
	[.829]	[.467]	[.803]	[.700]	**[.000]**	**[.001]**	[-]	
RODC	.529	.243	.267	.469	**.694***	**.714***	**.661***	1.000
	[.116]	[.498]	[.455]	[.203]	**[.003]**	**[.002]**	**[.005]**	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).

p-values are given in square brackets.

APPENDIX A (continued)

Table 5.6: Spearman's Correlation Coefficient of Liquidity Ratios for Islamic Banks and Conventional Banks (2007)

	CDRI	**LDRI**	**CRI**	**CARI**	**CDRC**	**LDRC**	**CRC**	**CARC**
CDRI	1.000	-	-	-	-	-	-	-
	[-]							
LDRI	-.550	1.000	-	-	-	-	-	-
	[.125]	[-]						
CRI	.017	.267	1.000	-	-	-	-	-
	[.966]	[.488]	[-]					
CARI	-.333	-.017	.017	1.000	-	-	-	-
	[.381]	[.966]	[.966]	[-]				
CDRC	-.417	-.233	-.533	**.636***	1.000	-	-	-
	[.265]	[.546]	[.139]	**[.048]**	[-]			
LDRC	.067	.533	.300	-.297	-.384	1.000	-	-
	[.865]	[.139]	[.433]	[.405]	[.142]	[-]		
CRC	-.467	.250	-.350	.139	.238	.268	1.000	-
	[.205]	[.516]	[.356]	[.701]	[.374]	[.316]	[-]	
CARC	-.167	-.200	-.250	.018	**.547***	**-.512***	.202	1.000
	[.668]	[.606]	[.516]	[.960]	**[.028]**	**[.043]**	[.454]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).

p-values are given in square brackets.

APPENDIX A (continued)

Table 5.7: Spearman's Correlation Coefficient of Risk and Solvency Ratios for Islamic Banks and Conventional Banks (2007)

	DERI	**DTARI**	**EMI**	**DERI**	**DTARC**	**EMC**
DERI	1.000	-	-	-	-	-
	[-]					
DTARI	**.927***	1.000	-	-	-	-
	[.000]	[-]				
EMI	**1.000***	**.927***	1.000	-	-	-
	[-]	**[.000]**	[-]			
DERI	-.370	-.236	-.370	1.000	-	-
	[.293]	[.511]	[.293]	[-]		
DTARC	-.309	-.079	-.309	.265	1.000	-
	[.385]	[.829]	[.385]	[.322]	[-]	
EMC	-.321	-.200	-.321	**.885***	.035	1.000
	[.365]	[.580]	[.365]	**[.000]**	[.897]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

Table 5.8: Spearman's Correlation Coefficient of Efficiency Ratios for Islamic Banks and Conventional Banks (2007)

	AUI	**OEI**	**AUC**	**OEC**
AUI	1.000	-	-	-
	[-]			
OEI	-.503	1.000	-	-
	[.138]	[-]		
AUC	.164	-.370	1.000	-
	[.651]	[.293]	[-]	
OEC	.212	-.297	.147	1.000
	[.556]	[.405]	[.587]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

APPENDIX A (continued)

Table 5.9: Mann-Whitney Wilcoxon Test (Year 2007)

Variables		*z*-value	*p*-value
Profitability Ratios	ROA	-1.359	0.174
	ROE	-2.887	**0.004**
	PER	-1.189	0.234
	ROD	-2.040	**0.041**
Liquidity Ratios	CDR	-1.472	0.141
	LDR	-1.642	0.101
	CR	-0.226	0.821
	CAR	-3.057	**0.002**
Risk & Solvency	DER	-3.227	**0.001**
	DTAR	-2.378	**0.017**
	EM	-3.452	**0.001**
Efficiency	AU	-2.378	**0.017**
	OE	-0.566	0.571

Note: 10% level of significance is used.

APPENDIX B

Table 6.1: Descriptive Statistics for Islamic Banks (Year 2008)

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0743	0.0041	0.2665	-0.0124	1.0000	3.5877
	ROE	0.1959	0.0039	0.3118	-0.0995	1.1597	1.5920
	PER	0.4543	0.0041	0.6379	-0.5280	1.8734	1.4041
	ROD	0.0044	0.0041	0.0081	-0.0141	0.0185	1.8429
Liquidity Ratios (%)	CDR	0.4579	0.0043	0.3767	0.1220	1.6727	0.8226
	LDR	0.6842	0.0041	0.3312	0.1587	1.4306	0.4841
	CR	1.1119	0.0043	0.1053	0.8708	1.2978	0.0947
	CAR	16.0637	0.0044	56.4491	0.8305	212.1900	3.5141
Risk & Solvency Ratios (%)	DER	53.4887	0.0043	66.7658	3.5038	252.3988	1.2482
	DTAR	13.5289	0.0036	47.1668	0.7859	177.4051	3.4864
	EM	56.9871	0.0029	71.6292	0.0253	269.2472	1.2569
Efficiency Ratios (%)	AU	0.3435	0.0017	1.2102	0.0009	4.5479	3.5235
	OE	0.6756	0.0029	0.4691	0.2542	1.7226	0.6943

Table 6.2: Descriptive Statistics for Conventional Banks (Year 2008)

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0125	0.0125	0.0045	0.0005	0.0189	0.3586
	ROE	1.7251	0.0136	2.4703	0.0810	7.6562	1.4319
	PER	0.3369	0.0125	0.0987	0.1396	0.4866	0.2928
	ROD	0.0200	0.0136	0.0085	0.0123	0.0473	0.4250
Liquidity Ratios (%)	CDR	0.2630	0.0138	0.1783	0.0515	0.7706	0.6778
	LDR	0.8352	0.0136	0.5492	0.1645	2.6872	0.6576
	CR	1.1191	0.0124	0.0633	1.0230	1.3153	0.0566
	CAR	0.8742	0.0136	0.2420	0.0961	1.0396	0.2769
Risk & Solvency Ratios (%)	DER	104.2158	0.0124	128.4535	7.1105	402.0795	1.2326
	DTAR	0.8728	0.0136	0.2113	0.0897	0.9727	0.2421
	EM	133.3069	0.0124	151.4728	8.5560	433.1165	1.1363
Efficiency Ratios (%)	AU	0.0194	0.0111	0.0083	0.0014	0.0386	0.4286
	OE	0.5333	0.0135	0.2719	0.0038	1.0298	0.5098

APPENDIX B (continued)

Table 6.3: Summary of CV for Islamic Banks and Conventional Banks (Year 2008)

Variables		Coefficient of Variance (CV)	
		Islamic Banks	Conventional Banks
Profitability Ratios (%)	ROA	3.5877	**0.3586**
	ROE	1.5920	**1.4319**
	PER	1.4041	**0.2928**
	ROD	1.8429	**0.4250**
Liquidity Ratios (%)	CDR	0.8226	**0.6778**
	LDR	**0.4841**	0.6576
	CR	0.0947	**0.0566**
	CAR	3.5141	**0.2769**
Risk & Solvency Ratios (%)	DER	1.2482	**1.2326**
	DTAR	3.4864	**0.2421**
	EM	1.2569	**1.1363**
Efficiency Ratios (%)	AU	3.5235	**0.4286**
	OE	0.6943	**0.5098**

Table 6.4: Normality Test for Islamic Banks and Conventional Banks (Year 2008)

Variables		Islamic Banks			Conventional Banks		
		Shapiro-Wilk Statistics	p-value	Conclusion	Shapiro-Wilk Statistics	p-value	Conclusion
Profitability Ratios	ROA	0.318	0.000	Not Normal	0.908	0.110	Normal
	ROE	0.722	0.001	Not Normal	0.647	0.000	Not Normal
	PER	0.954	0.628	Normal	0.922	0.184	Normal
	ROD	0.956	0.663	Normal	0.743	0.001	Not Normal
Liquidity Ratios	CDR	0.662	0.000	Not Normal	0.871	0.028	Not Normal
	LDR	0.968	0.853	Normal	0.683	0.000	Not Normal
	CR	0.939	0.403	Normal	0.820	0.005	Not Normal
	CAR	0.297	0.000	Not Normal	0.583	0.000	Not Normal
Risk & Solvency Ratios	DER	0.726	0.001	Not Normal	0.685	0.000	Not Normal
	DTAR	0.298	0.000	Not Normal	0.397	0.000	Not Normal
	EM	0.733	0.001	Not Normal	0.729	0.000	Not Normal
Efficiency Ratios	AU	0.308	0.000	Not Normal	0.961	0.684	Not Normal
	OE	0.739	0.001	Not Normal	0.953	0.541	Not Normal

APPENDIX B (continued)

Table 6.5: Spearman's Correlation Coefficient of Profitability Ratios for Islamic Banks and Conventional Banks (2008)

	ROAI	**ROEI**	**PERI**	**RODI**	**ROAC**	**ROEC**	**PERC**	**RODC**
ROAI	1.000	-	-	-	-	-	-	-
	[-]							
ROEI	.515	1.000	-	-	-	-	-	-
	[.060]	[-]						
PERI	**.620***	**.780***	1.000	-	-	-	-	-
	[.018]	**[.001]**	[-]					
RODI	**.980***	**.581***	**.697***	1.000	-	-	-	-
	[.000]	**[.029]**	**[.006]**	[-]				
ROAC	-.097	-.138	.134	-.117	1.000	-	-	-
	[.742]	[.637]	[.648]	[.691]	[-]			
ROEC	.207	.077	.332	.185	**.715***	1.000	-	-
	[.478]	[.794]	[.246]	[.527]	**[.002]**	[-]		
PERC	-.128	-.068	.121	-.114	**.668***	**.682***	1.000	-
	[.664]	[.817]	[.681]	[.697]	**[.005]**	**[.004]**	[-]	
RODC	.110	-.020	.262	.143	**.729***	**.532***	.426	1.000
	[.708]	[.946]	[.366]	[.626]	**[.001]**	**[.034]**	[.099]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).

p-values are given in square brackets.

APPENDIX B (continued)

Table 6.6: Spearman's Correlation Coefficient of Liquidity Ratios for Islamic Banks and Conventional Banks (2008)

	CDRI	**LDRI**	**CRI**	**CARI**	**CDRC**	**LDRC**	**CRC**	**CARC**
CDRI	1.000	-	-	-	-	-	-	-
	[-]							
LDRI	**-.657***	1.000	-	-	-	-	-	-
	[.011]	[-]						
CRI	-.235	.521	1.000	-	-	-	-	-
	[.418]	[.056]	[-]					
CARI	-.204	.402	.459	1.000	-	-	-	-
	[.483]	[.154]	[.098]	[-]				
CDRC	-.051	-.310	**-.591***	**-.578***	1.000	-	-	-
	[.864]	[.281]	**[.026]**	**[.030]**	[-]			
LDRC	-.266	.508	**.582***	-.081	.176	1.000	-	-
	[.358]	[.064]	**[.029]**	[.782]	[.513]	[-]		
CRC	-.481	.209	-.081	.204	.015	-.026	1.000	-
	[.081]	[.474]	[.782]	[.483]	[.957]	[.922]	[-]	
CARC	-.196	.262	.077	-.156	.115	.394	.279	1.000
	[.503]	[.366]	[.794]	[.594]	[.672]	[.131]	[.295]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).

p-values are given in square brackets.

APPENDIX B (continued)

Table 6.7: Spearman's Correlation Coefficient of Risk and Solvency Ratios for Islamic Banks and Conventional Banks (2008)

	DERI	**DTARI**	**EMI**	**DERI**	**DTARC**	**EMC**
DERI	1.000	-	-	-	-	-
	[-]					
DTARI	.178	1.000	-	-	-	-
	[.543]	[-]				
EMI	**.996***	.121	1.000	-	-	-
	[.000]	[.681]	[-]			
DERI	-.393	-.200	-.402	1.000	-	-
	[.164]	[.493]	[.154]	[-]		
DTARC	-.266	-.204	-.253	**.506***	1.000	-
	[.358]	[.483]	[.383]	**[.046]**	[-]	
EMC	-.371	-.349	-.380	**.829***	.174	1.000
	[.191]	[.221]	[.180]	**[.000]**	[.520]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

Table 6.8: Spearman's Correlation Coefficient of Efficiency Ratios for Islamic Banks and Conventional Banks (2008)

	AUI	**OEI**	**AUC**	**OEC**
AUI	1.000	-	-	-
	[-]			
OEI	-.415	1.000	-	-
	[.140]	[-]		
AUC	-.233	-.035	1.000	-
	[.422]	[.905]	[-]	
OEC	.218	-.349	.474	1.000
	[.455]	[.221]	[.064]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

APPENDIX B (continued)

Table 6.9: Mann-Whitney Wilcoxon Test (Year 2008)

Variables		*z*-value	*p*-value
Profitability Ratios	ROA	-3.118	**0.002**
	ROE	-3.492	**0.000**
	PER	-1.206	0.228
	ROD	-4.241	**0.000**
Liquidity Ratios	CDR	-0.915	0.360
	LDR	-2.162	**0.031**
	CR	-0.457	0.647
	CAR	-2.785	**0.005**
Risk & Solvency	DER	-1.538	0.124
	DTAR	-1.206	0.228
	EM	-1.829	**0.067**
Efficiency	AU	-0.083	0.934
	OE	-0.166	0.868

Note: 10% level of significance is used.

APPENDIX C

Table 7.1: Descriptive Statistics for Islamic Banks (Year 2009)

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0059	0.0103	0.0049	-0.0022	0.0152	0.8266
	ROE	0.5482	0.0103	0.9587	-0.0115	3.2346	1.7487
	PER	0.5415	0.0112	0.6129	-0.1884	2.2449	1.1319
	ROD	0.0089	0.0112	0.0085	-0.0061	0.0265	0.9563
Liquidity Ratios (%)	CDR	0.5065	0.0136	0.4454	0.1017	1.7760	0.8794
	LDR	0.8887	0.0136	0.3605	0.3832	1.6598	0.4057
	CR	1.1169	0.0136	0.0612	1.0324	1.2766	0.0548
	CAR	0.9809	0.0136	0.0216	0.9194	0.9990	0.0220
Risk & Solvency Ratios (%)	DER	54.8858	0.0136	75.2688	4.1045	284.7795	1.3714
	DTAR	0.9064	0.0129	0.0493	0.8035	0.9681	0.0543
	EM	59.5483	0.0683	81.4447	5.1084	307.9330	1.3677
Efficiency Ratios (%)	AU	0.0272	0.0683	0.0127	0.0106	0.0516	0.4678
	OE	0.5775	0.0683	0.2433	0.2514	1.1279	0.4213

Table 7.2: Descriptive Statistics for Conventional Banks (Year 2009)

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0092	0.0098	0.0047	-0.0014	0.0171	0.5071
	ROE	1.2260	0.0098	1.7503	-0.0468	5.5402	1.4277
	PER	0.3433	0.0106	0.1930	-0.0401	0.6402	0.5621
	ROD	0.0142	0.0113	0.0104	-0.0020	0.0453	0.7351
Liquidity Ratios (%)	CDR	0.3232	0.0114	0.2437	0.1070	1.0115	0.7542
	LDR	0.7812	0.0113	0.5112	0.0957	2.4697	0.6544
	CR	1.1389	0.0114	0.0679	1.0758	1.3503	0.0596
	CAR	0.9758	0.0115	0.0424	0.8656	1.0883	0.0435
Risk & Solvency Ratios (%)	DER	103.0704	0.0117	127.4795	6.3579	427.6056	1.2368
	DTAR	0.9156	0.0119	0.0427	0.8126	1.0229	0.0467
	EM	111.2237	0.0119	137.0133	7.8239	460.8234	1.2319
Efficiency Ratios (%)	AU	0.0158	0.0115	0.0048	0.0056	0.0273	0.3054
	OE	0.7083	0.0097	0.4301	0.0316	1.7276	0.6072

APPENDIX C (continued)

Table 7.3: Summary of CV for Islamic Banks and Conventional Banks (Year 2009)

Variables		Coefficient of Variance (CV)	
		Islamic Banks	Conventional Banks
Profitability Ratios (%)	ROA	0.8266	**0.5071**
	ROE	1.7487	**1.4277**
	PER	1.1319	**0.5621**
	ROD	0.9563	**0.7351**
Liquidity Ratios (%)	CDR	0.8794	**0.7542**
	LDR	**0.4057**	0.6544
	CR	**0.0548**	0.0596
	CAR	**0.0220**	0.0435
Risk & Solvency Ratios (%)	DER	1.3714	**1.2368**
	DTAR	0.0543	**0.0467**
	EM	1.3677	**1.2319**
Efficiency Ratios (%)	AU	0.4678	**0.3054**
	OE	**0.4213**	0.6072

Table 7.4: Normality Test for Islamic Banks and Conventional Banks (Year 2009)

Variables		Islamic Banks			Conventional Banks		
		Shapiro-Wilk Statistics	p-value	Conclusion	Shapiro-Wilk Statistics	p-value	Conclusion
Profitability Ratios	ROA	0.984	0.991	Normal	0.926	0.211	Normal
	ROE	0.615	0.000	Not Normal	0.682	0.000	Not Normal
	PER	0.834	0.014	Not Normal	0.976	0.920	Normal
	ROD	0.939	0.405	Normal	0.855	0.016	Not Normal
Liquidity Ratios	CDR	0.728	0.001	Not Normal	0.708	0.000	Not Normal
	LDR	0.960	0.722	Normal	0.695	0.000	Not Normal
	CR	0.901	0.116	Normal	0.742	0.001	Not Normal
	CAR	0.735	0.001	Not Normal	0.748	0.001	Not Normal
Risk & Solvency Ratios	DER	0.687	0.000	Not Normal	0.700	0.000	Not Normal
	DTAR	0.902	0.121	Normal	0.867	0.024	Not Normal
	EM	0.687	0.000	Not Normal	0.698	0.000	Not Normal
Efficiency Ratios	AU	0.915	0.185	Normal	0.949	0.478	Normal
	OE	0.941	0.428	Normal	0.961	0.683	Normal

APPENDIX C (continued)

Table 7.5: Spearman's Correlation Coefficient of Profitability Ratios for Islamic Banks and Conventional Banks (2009)

	ROAI	**ROEI**	**PERI**	**RODI**	**ROAC**	**ROEC**	**PERC**	**RODC**
ROAI	1.000	-	-	-	-	-	-	-
	[-]							
ROEI	**.666***	1.000	-	-	-	-	-	-
	[.009]	[-]						
PERI	**.864***	**.710***	1.000	-	-	-	-	-
	[.000]	**[.004]**	[-]					
RODI	**.906***	**.752***	**.832***	1.000	-	-	-	-
	[.000]	**[.002]**	**[.000]**	[-]				
ROAC	-.116	-.182	-.081	-.365	1.000	-	-	-
	[.692]	[.533]	[.782]	[.199]	[-]			
ROEC	.116	-.116	.226	-.099	**.653***	1.000	-	-
	[.692]	[.692]	[.436]	[.736]	**[.006]**	[-]		
PERC	-.231	-.266	-.213	-.462	**.753***	**.506***	1.000	-
	[.427]	[.358]	[.464]	[.096]	**[.001]**	**[.046]**	[-]	
RODC	-.108	-.180	-.086	-.341	**.949***	**.637***	**.858***	1.000
	[.714]	[.537]	[.771]	[.232]	**[.000]**	**[.008]**	**[.000]**	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).

p-values are given in square brackets.

APPENDIX C (continued)

Table 7.6: Spearman's Correlation Coefficient of Liquidity Ratios for Islamic Banks and Conventional Banks (2009)

	CDRI	**LDRI**	**CRI**	**CARI**	**CDRC**	**LDRC**	**CRC**	**CARC**
CDRI	1.000	-	-	-	-	-	-	-
	[-]							
LDRI	.121	1.000	-	-	-	-	-	-
	[.681	[-]						
CRI	.226	.226	1.000	-	-	-	-	-
	[.436	[.436	[-]					
CARI	.051	-.297	-.327	1.000	-	-	-	-
	[.864	[.303	[.253]	[-]				
CDRC	.042	.024	-.086	.380	1.000	-	-	-
	[.887	[.935	[.771]	[.180]	[-]			
LDRC	-.314	-.029	.099	-.424	**-.512***	1.000	-	-
	[.274	[.923	[.737]	[.131]	**[.043]**	[-]		
CRC	-.077	.121	.389	-.459	.226	.035	1.000	-
	[.794]	[.681]	[.169]	[.098]	[.399]	[.897]	[-]	
CARC	-.275	.275	.332	**-.600***	-.215	.485	.118	1.000
	[.342]	[.342]	[.246]	**[.023]**	[.425]	[.057]	[.664]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).

p-values are given in square brackets.

APPENDIX C (continued)

Table 7.7: Spearman's Correlation Coefficient of Risk and Solvency Ratios for Islamic Banks and Conventional Banks (2009)

	DERI	**DTARI**	**EMI**	**DERI**	**DTARC**	**EMC**
DERI	1.000	-	-	-	-	-
	[-]					
DTARI	.519	1.000	-	-	-	-
	[.057]	[-]				
EMI	**.996***	.510	1.000	-	-	-
	[.000]	[.062]	[-]			
DERI	-.081	-.121	-.095	1.000	-	-
	[.782]	[.680]	[.748]	[-]		
DTARC	.121	.075	.081	**.618***	1.000	-
	[.681]	[.799]	[.782]	**[.011]**	[-]	
EMC	-.046	-.114	-.055	**.994***	**.597***	1.000
	[.876]	[.697]	[.852]	**[.000]**	**[.015]**	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

Table 7.8: Spearman's Correlation Coefficient of Efficiency Ratios for Islamic Banks and Conventional Banks (2009)

	AUI	**OEI**	**AUC**	**OEC**
AUI	1.000	-	-	-
	[-]			
OEI	**-.569***	1.000	-	-
	[.034]	[-]		
AUC	-.112	-.165	1.000	-
	[.703]	[.573]	[-]	
OEC	**.543***	**-.618***	.018	1.000
	[.045]	**[.019]**	[.948]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

APPENDIX C (continued)

Table 7.9: Mann-Whitney Wilcoxon Test (Year 2009)

Variables		*z*-value	*p*-value
Profitability Ratios	ROA	-1.829	**0.067**
	ROE	-1.829	**0.067**
	PER	-0.540	0.589
	ROD	-1.746	**0.081**
Liquidity Ratios	CDR	-1.954	**0.051**
	LDR	-1.039	0.299
	CR	-0.956	0.339
	CAR	-1.725	**0.084**
Risk & Solvency	DER	-1.580	0.114
	DTAR	-0.270	0.787
	EM	-1.580	0.114
Efficiency	AU	-2.682	**0.007**
	OE	-0.915	0.360

Note: 10% level of significance is used.

APPENDIX D

Table 8.1: Descriptive Statistics for Islamic Banks (Year 2010)

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0061	0.0066	0.0086	-0.0151	0.0172	1.4000
	ROE	0.5912	0.0075	1.0217	-0.0761	3.6684	1.7283
	PER	0.5644	0.0084	0.7625	-0.7415	2.3585	1.3510
	ROD	0.0084	0.0075	0.0163	-0.0300	0.0359	1.9260
Liquidity Ratios (%)	CDR	0.3747	0.0084	0.2480	0.0933	1.0198	0.6619
	LDR	0.9107	0.0075	0.3592	0.4411	1.7724	0.3944
	CR	1.1227	0.0084	0.0516	1.0363	1.2394	0.0460
	CAR	0.9888	0.0075	0.0094	0.9608	0.9972	0.0095
Risk & Solvency Ratios (%)	DER	58.0689	0.0066	93.8718	3.9146	369.4410	1.6166
	DTAR	0.9051	0.0074	0.0403	0.8144	0.9629	0.0445
	EM	63.2264	0.0092	101.6905	4.8068	399.2544	1.6084
Efficiency Ratios (%)	AU	0.0298	0.0086	0.0162	0.0028	0.0648	0.5446
	OE	0.9163	0.0117	1.2935	0.2371	5.1259	1.4117

Table 8.2: Descriptive Statistics for Conventional Banks (Year 2010)

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0110	0.0117	0.0047	-0.0014	0.0173	0.4231
	ROE	1.4318	0.0118	1.8975	-0.0393	6.2964	1.3253
	PER	0.4233	0.0120	0.2128	-0.0462	0.7638	0.5028
	ROD	0.0172	0.0122	0.0127	-0.0041	0.0571	0.7387
Liquidity Ratios (%)	CDR	0.3455	0.0122	0.3656	0.1062	1.4727	1.0584
	LDR	0.8196	0.0122	0.5015	0.1362	2.4702	0.6119
	CR	1.1691	0.0122	0.1279	1.0889	1.6347	0.1094
	CAR	0.9880	0.0123	0.0480	0.9366	1.1590	0.0486
Risk & Solvency Ratios (%)	DER	109.1940	0.0127	137.4647	7.9042	481.0251	1.2589
	DTAR	0.9157	0.0123	0.0497	0.8400	1.0675	0.0543
	EM	118.1348	0.0119	147.8686	9.4095	516.9675	1.2517
Efficiency Ratios (%)	AU	0.0184	0.0115	0.0064	0.0075	0.0351	0.3479
	OE	0.5732	0.0102	0.4346	0.0680	1.3619	0.7581

APPENDIX D (continued)

Table 8.3: Summary of CV for Islamic Banks and Conventional Banks (Year 2010)

Variables		Coefficient of Variance (CV)	
		Islamic Banks	Conventional Banks
Profitability Ratios (%)	ROA	1.4000	**0.4231**
	ROE	1.7283	**1.3253**
	PER	1.3510	**0.5028**
	ROD	1.9260	**0.7387**
Liquidity Ratios (%)	CDR	**0.6619**	1.0584
	LDR	**0.3944**	0.6119
	CR	**0.0460**	0.1094
	CAR	**0.0095**	0.0486
Risk & Solvency Ratios (%)	DER	1.6166	**1.2589**
	DTAR	**0.0445**	0.0543
	EM	1.6084	**1.2517**
Efficiency Ratios (%)	AU	0.5446	**0.3479**
	OE	1.4117	**0.7581**

Table 8.4: Normality Test for Islamic Banks and Conventional Banks (Year 2010)

Variables		Islamic Banks			Conventional Banks		
		Shapiro-Wilk Statistics	p-value	Conclusion	Shapiro-Wilk Statistics	p-value	Conclusion
Profitability Ratios	ROA	0.873	0.037	Not Normal	0.920	0.168	Normal
	ROE	0.626	0.000	Not Normal	0.716	0.000	Not Normal
	PER	0.937	0.350	Normal	0.972	0.872	Normal
	ROD	0.871	0.035	Not Normal	0.793	0.002	Not Normal
Liquidity Ratios	CDR	0.886	0.058	Not Normal	0.628	0.000	Not Normal
	LDR	0.942	0.411	Normal	0.677	0.000	Not Normal
	CR	0.955	0.613	Normal	0.494	0.000	Not Normal
	CAR	0.791	0.003	Not Normal	0.563	0.000	Not Normal
Risk & Solvency Ratios	DER	0.584	0.000	Not Normal	0.702	0.000	Not Normal
	DTAR	0.875	0.040	Not Normal	0.797	0.002	Not Normal
	EM	0.585	0.000	Not Normal	0.701	0.000	Not Normal
Efficiency Ratios	AU	0.980	0.973	Normal	0.925	0.206	Normal
	OE	0.519	0.000	Not Normal	0.910	0.117	Normal

APPENDIX D (continued)

Table 8.5: Spearman's Correlation Coefficient of Profitability Ratios for Islamic Banks and Conventional Banks (2010)

	ROAI	**ROEI**	**PERI**	**RODI**	**ROAC**	**ROEC**	**PERC**	**RODC**
ROAI	1.000	-	-	-	-	-	-	-
	[-]							
ROEI	**.739***	1.000	-	-	-	-	-	-
	[.002]	[-]						
PERI	**.829***	**.661***	1.000	-	-	-	-	-
	[.000]	**[.007]**	[-]					
RODI	**.946***	**.825***	**.796***	1.000	-	-	-	-
	[.000]	**[.000]**	**[.000]**	[-]				
ROAC	-.179	.011	-.186	-.225	1.000	-	-	-
	[.524]	[.970]	[.508]	[.420]	[-]			
ROEC	.104	-.021	.193	-.050	**.574***	1.000	-	-
	[.713]	[.940]	[.491]	[.860]	**[.020]**	[-]		
PERC	-.396	-.225	-.350	-.450	**.791***	.447	1.000	-
	[.143]	[.420]	[.201]	[.092]	**[.000]**	[.083]	[-]	
RODC	-.175	-.111	-.157	-.282	**.926***	**.559***	**.847***	1.000
	[.533]	[.694]	[.576]	[.308]	**[.000]**	**[.024]**	**[.000]**	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).

p-values are given in square brackets.

APPENDIX D (continued)

Table 8.6: Spearman's Correlation Coefficient of Liquidity Ratios for Islamic Banks and Conventional Banks (2010)

	CDRI	**LDRI**	**CRI**	**CARI**	**CDRC**	**LDRC**	**CRC**	**CARC**
CDRI	1.000	-	-	-	-	-	-	-
	[-]							
LDRI	.346	1.000	-	-	-	-	-	-
	[.206]	[-]						
CRI	.375	.168	1.000	-	-	-	-	-
	[.168]	[.550]	[-]					
CARI	-.461	-.489	-.471	1.000	-	-	-	-
	[.084]	[.064]	[.076]	[-]				
CDRC	-.129	-.154	-.154	.029	1.000	-	-	-
	[.648]	[.585]	[.585]	[.919]	[-]			
LDRC	-.393	.104	-.143	.314	-.209	1.000	-	-
	[.147]	[.713]	[.612]	[.254]	[.438]	[-]		
CRC	-.221	-.082	-.189	-.093	.356	-.194	1.000	-
	[.428]	[.771]	[.499]	[.742]	[.176]	[.471]	[-]	
CARC	-.021	**.575***	-.050	-.143	-.182	**.529***	-.159	1.000
	[.940]	**[.025]**	[.860]	[.612]	[.499]	**[.035]**	[.557]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).

p-values are given in square brackets.

APPENDIX D (continued)

Table 8.7: Spearman's Correlation Coefficient of Risk and Solvency Ratios for Islamic Banks and Conventional Banks (2010)

	DERI	**DTARI**	**EMI**	**DERI**	**DTARC**	**EMC**
DERI	1.000	-	-	-	-	-
	[-]					
DTARI	**.636***	1.000	-	-	-	-
	[.011]	[-]				
EMI	**.996***	**.614***	1.000	-	-	-
	[.000]	**[.015]**	[-]			
DERI	-.046	-.125	-.075	1.000	-	-
	[.869]	[.657]	[.791]	[-]		
DTARC	.246	.161	.211	**.547***	1.000	-
	[.376]	[.567]	[.451]	**[.028]**	[-]	
EMC	-.036	-.093	-.064	**.988***	.485	1.000
	[.899]	[.742]	[.820]	**[.000]**	[.057]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

Table 8.8: Spearman's Correlation Coefficient of Efficacy Ratios for Islamic Banks and Conventional Banks (2010)

	AUI	**OEI**	**AUC**	**OEC**
AUI	1.000	-	-	-
	[-]			
OEI	-.489	1.000	-	-
	[.064]	[-]		
AUC	-.018	.289	1.000	-
	[.950]	[.296]	[-]	
OEC	**.679***	-.493	-.356	1.000
	[.005]	[.062]	[.176]	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

APPENDIX D (continued)

Table 8.9: Mann-Whitney Wilcoxon Test (Year 2010)

Variables		*z*-value	*p*-value
Profitability Ratios	ROA	-2.095	**0.036**
	ROE	-2.174	**0.030**
	PER	-0.356	0.722
	ROD	-1.957	**0.050**
Liquidity Ratios	CDR	-1.107	0.268
	LDR	-1.028	0.304
	CR	-1.502	0.133
	CAR	-2.194	**0.028**
Risk & Solvency	DER	-1.937	**0.053**
	DTAR	-0.040	0.968
	EM	-1.937	**0.053**
Efficiency	AU	-2.392	**0.017**
	OE	-0.316	0.752

Note: 10% level of significance is used.

APPENDIX E

Table 9.1: Descriptive Statistics for Islamic Banks (Year 2011)

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0078	0.0077	0.0250	-0.0569	0.0745	3.1922
	ROE	0.7857	0.0077	1.5015	-0.2548	5.6550	1.9109
	PER	0.7160	0.0078	1.5216	-3.2989	4.2472	2.1252
	ROD	0.0125	0.0077	0.0550	-0.1223	0.1667	4.3903
Liquidity Ratios (%)	CDR	0.3752	0.0077	0.2732	0.0271	0.9574	0.7281
	LDR	0.8313	0.0075	0.2512	0.4429	1.3780	0.3022
	CR	1.1308	0.0077	0.1100	1.0429	1.4695	0.0972
	CAR	1.0082	0.0066	0.0854	0.9552	1.3135	0.0847
Risk & Solvency Ratios (%)	DER	80.3967	0.0077	142.9086	3.6838	560.2763	1.7775
	DTAR	0.9151	0.0069	0.0405	0.8045	0.9553	0.0443
	EM	86.1942	0.0094	152.3136	4.4756	596.0937	1.7671
Efficiency Ratios (%)	AU	0.0310	0.0069	0.0144	0.0130	0.0569	0.4640
	OE	0.4780	0.0094	0.2106	0.2394	0.9958	0.4407

Table 9.2: Descriptive Statistics for Conventional Banks (Year 2011)

Variables		Mean	Median	Std. Dev	Minimum	Maximum	CV
Profitability Ratios (%)	ROA	0.0113	0.0116	0.0032	0.0047	0.0159	0.2881
	ROE	1.6593	0.0118	2.3334	0.0364	8.3587	1.4063
	PER	0.4134	0.0120	0.1699	0.1678	0.8491	0.4110
	ROD	0.0182	0.0122	0.0109	0.0078	0.0557	0.5990
Liquidity Ratios (%)	CDR	0.3044	0.0120	0.2442	0.0314	0.8786	0.8023
	LDR	0.8486	0.0118	0.5895	0.1392	2.8708	0.6946
	CR	1.1484	0.0118	0.0535	1.0716	1.2663	0.0466
	CAR	0.9862	0.0120	0.0721	0.8209	1.2080	0.0731
Risk & Solvency Ratios (%)	DER	121.6672	0.0118	158.8682	5.3957	601.7271	1.3058
	DTAR	0.9226	0.0120	0.0710	0.7972	1.1151	0.0769
	EM	130.8828	0.0118	170.8295	6.7680	643.0854	1.3052
Efficiency Ratios (%)	AU	0.0176	0.0115	0.0065	0.0054	0.0332	0.3675
	OE	0.5891	0.0111	0.5103	0.0212	1.6216	0.8662

APPENDIX E (continued)

Table 9.3: Summary of CV for Islamic Banks and Conventional Banks (Year 2011)

Variables		Coefficient of Variance (CV)	
		Islamic Banks	Conventional Banks
Profitability Ratios (%)	ROA	3.1922	**0.2881**
	ROE	1.9109	**1.4063**
	PER	2.1252	**0.4110**
	ROD	4.3903	**0.5990**
Liquidity Ratios (%)	CDR	**0.7281**	0.8023
	LDR	**0.3022**	0.6946
	CR	0.0972	**0.0466**
	CAR	0.0847	**0.0731**
Risk & Solvency Ratios (%)	DER	1.7775	**1.3058**
	DTAR	**0.0443**	0.0769
	EM	1.7671	**1.3052**
Efficiency Ratios (%)	AU	0.4640	**0.3675**
	OE	**0.4407**	0.8662

Table 9.4: Normality Test for Islamic Banks and Conventional Banks (Year 2011)

Variables		Islamic Banks			Conventional Banks		
		Shapiro-Wilk Statistics	p-value	Conclusion	Shapiro-Wilk Statistics	p-value	Conclusion
Profitability Ratios	ROA	0.642	0.000	Not Normal	0.950	0.487	Normal
	ROE	0.586	0.000	Not Normal	0.684	0.000	Not Normal
	PER	0.777	0.002	Not Normal	0.909	0.111	Normal
	ROD	0.610	0.000	Not Normal	0.662	0.000	Not Normal
Liquidity Ratios	CDR	0.864	0.028	Not Normal	0.864	0.022	Not Normal
	LDR	0.957	0.644	Normal	0.630	0.000	Normal
	CR	0.713	0.000	Not Normal	0.856	0.016	Not Normal
	CAR	0.419	0.000	Not Normal	0.613	0.000	Not Normal
Risk & Solvency Ratios	DER	0.559	0.000	Not Normal	0.695	0.000	Not Normal
	DTAR	0.810	0.005	Not Normal	0.846	0.012	Not Normal
	EM	0.561	0.000	Not Normal	0.692	0.000	Not Normal
Efficiency Ratios	AU	0.913	0.149	Normal	0.951	0.511	Normal
	OE	0.889	0.065	Not Normal	0.903	0.090	Not Normal

APPENDIX E (continued)

Table 9.5: Spearman's Correlation Coefficient of Profitability Ratios for Islamic Banks and Conventional Banks (2011)

	ROAI	**ROEI**	**PERI**	**RODI**	**ROAC**	**ROEC**	**PERC**	**RODC**
ROAI	1.000	-	-	-	-	-	-	-
	[-]							
ROEI	**.654***	1.000	-	-	-	-	-	-
	.008	.						
PERI	**.761***	**.571***	1.000	-	-	-	-	-
	.001	**.026**	[-]					
RODI	**.933***	**.744***	**.676***	1.000	-	-	-	-
	.000	**.001**	**.006**	.				
ROAC	.193	.118	.368	.088	1.000	-	-	-
	.491	.676	.177	.756	[-]			
ROEC	.171	-.089	.329	.057	**.756***	1.000	-	-
	.541	.752	.232	.840	**.001**	.		
PERC	.214	.118	.354	.216	**.894***	**.682***	1.000	-
	.443	.676	.196	.439	**.000**	**.004**	[-]	
RODC	.229	.193	.379	.227	**.756***	.447	**.759***	1.000
	.413	.491	.164	.416	**.001**	.083	**.001**	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).

p-values are given in square brackets.

APPENDIX E (continued)

Table 9.6: Spearman's Correlation Coefficient of Liquidity Ratios for Islamic Banks and Conventional Banks (2011)

	CDRI	**LDRI**	**CRI**	**CARI**	**CDRC**	**LDRC**	**CRC**	**CARC**
CDRI	1.000	-	-	-	-	-	-	-
	[-]							
LDRI	.093	1.000	-	-	-	-	-	-
	.742	.						
CRI	.189	.014	1.000	-	-	-	-	-
	.499	.960	[-]					
CARI	-.261	**-.574***	.150	1.000	-	-	-	-
	.348	**.025**	.593	.				
CDRC	.289	-.482	.011	.161	1.000	-	-	-
	.296	.069	.970	.567	[-]			
LDRC	-.304	.232	-.150	.100	-.326	1.000	-	-
	.271	.405	.594	.723	.217	.		
CRC	.061	-.111	.343	.097	**.518***	-.156	1.000	-
	.830	.694	.211	.732	**.040**	.564	[-]	
CARC	.014	**.768***	-.118	-.433	-.235	.229	-.197	1.000
	.960	**.001**	.676	.107	.380	.393	.464	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

APPENDIX E (continued)

Table 9.7: Spearman's Correlation Coefficient of Risk and Solvency Ratios for Islamic Banks and Conventional Banks (2011)

	DERI	**DTARI**	**EMI**	**DERI**	**DTARC**	**EMC**
DERI	1.000	-	-	-	-	-
	[-]					
DTARI	**.600***	1.000	-	-	-	-
	.018	.				
EMI	**.996***	**.596***	1.000	-	-	-
	.000	**.019**	[-]			
DERI	-.179	-.196	-.196	1.000	-	-
	.524	.483	.483	.		
DTARC	.111	.111	.096	**.626***	1.000	-
	.694	.694	.732	**.009**	[-]	
EMC	-.196	-.171	-.211	**.988***	**.550***	1.000
	.483	.541	.451	**.000**	**.027**	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

Table 9.8: Spearman's Correlation Coefficient of Efficiency Ratios for Islamic Banks and Conventional Banks (2011)

	AUI	**OEI**	**AUC**	**OEC**
AUI	1.000	-	-	-
	[-]			
OEI	-.486	1.000	-	-
	.066	.		
AUC	-.254	.307	1.000	-
	.362	.265	[-]	
OEC	**.604***	**-.539***	-.185	1.000
	.017	**.038**	.492	[-]

Note: * Correlation is significant at the 0.10 level (2-tailed).
p-values are given in square brackets.

APPENDIX E (continued)

Table 9.9: Mann-Whitney Wilcoxon Test (Year 2011)

Variables		*z*-value	*p*-value
Profitability Ratios	ROA	-2.471	**0.013**
	ROE	-2.253	**0.024**
	PER	-2.214	**0.027**
	ROD	-2.313	**0.021**
Liquidity Ratios	CDR	-0.909	0.363
	LDR	-0.712	0.477
	CR	-2.214	**0.027**
	CAR	-1.562	0.118
Risk & Solvency	DER	-1.621	0.105
	DTAR	-0.791	0.429
	EM	-1.621	0.105
Efficiency	AU	-2.807	**0.005**
	OE	-0.356	0.722

Note: 10% level of significance is used.