Performance Measurement Analysis: Shariah-compliant vs. Non Shariah-compliant Securities

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ABSTRACT

Using the sample of 107 shariah-compliant and non shariah-compliant securities in Malaysia from January 1990 to December 2011, we examine their performances by applying the performance measure of Jensen Alpha Index and Treynor Index. The sample period is divided into four segments of pre AFC (Asian Financial Crisis), during AFC, post AFC and Subprime Mortgage Crisis. Our results showed that the performance of shariah-compliant securities tend to be indifferent with non shariah-compliant securities. However, the performance of both portfolios is significantly different between the four segments of pre AFC, during AFC, post AFC and Subprime Mortgage Crisis. One important portfolio implication from this study is that the market players are able to plan ahead in their investment and portfolio diversification especially during economic downturns

Keywords: *Syariah-compliant, non shariah-compliant, performance measurement*

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Introduction

A rational investor will chose to maximize his possible return while at the same time minimize the level of risk assumed. This can be achieved by constructing a well-diversified portfolio among financial instruments available in the financial market. After all, the most efficient portfolio is dependent on the investor's right to select which one best suits them.

In previous years, the performance of ethical and non-ethical funds had captured the interests among scholars and their findings have been documented since then. For example Hylton (1992), Hamilton (1993), Mallin et al. (1995), Hickman et al. (1999), Statman (2000) and Asmundson and Foerster (2001) had documented the evidences on the performances of both ethical and non-ethical funds outside Malaysia.

In Malaysia, scholars such as Hayat (2006), Abdullah et al. (2007), Hayat and Kraeussl (2011) and Mansor and Bhatti (2011c) reported their findings on the performance of Islamic and Conventional Mutual Funds. Their findings are not only limited to the general perspectives but also extend to the impact from the changes in the economic environment in Malaysia.

So far, studies on the performance of shariah-compliant and non shariah-compliant securities are still considered minimal and most of the prior studies have been set forth towards the Islamic and Conventional mutual funds. In regards to changes in the economic environment, there has been scarce study that measures the direct comparative performance between shariah-compliant and non shariah-compliant securities in Malaysia. At the same time, Islamic Mutual Funds tend to beat Conventional Mutual Funds during the economic downturns (Mohd Hasimi and Noor Azuddin, 2002, Mohd Azlan et al., 2004, Elfakhani et al., 2005, Elfakhani and Hassan, 2005 & 2007, Hayat, 2006, Abdullah et al., 2007 and Merdad et al., 2010). Hence, this paper will shed light whether shariah-compliant securities outperform its counterparts or vice versa in different cycles of economic environment.

Background of the Study

This study is motivated towards the development of shariah-compliant securities in the Malaysian capital market over time. According to Table 1.1,

the total number of securities as at 25 November 2011 is 946; 839 securities are shariah-compliant leaving 107 non shariah-compliant (Securities Commission of Malaysia, 2011).

Table 1.1: Shariah-compliant Securities Listed in Bursa Malaysia as at 25 November 2011

Main Market/ ACE Market	Shariah-compliant securities	Total Securities	Percentage of Shariah-compliant securities (%)
Consumer Products	133	143	93
Industrial Products	268	277	97
Mining	1	1	100
Construction	42	43	98
Trading/ Services	168	197	85
Properties	77	90	86
Plantation	39	42	93
Technology	101	103	98
Infrastructure (IPC)	7	7	100
Finance	3	37	8
SPAC	Nil	1	Nil
Hotels	Nil	4	Nil
Closed-end-Fund	Nil	1	Nil
Total	**839**	**946**	**89**

Source: Securities Commission of Malaysia

It appears that all sectors of listed companies in Bursa Malaysia are adhering to shariah-based principles except the Special Purpose Acquisition Companies (SPAC), hotels and closed-end Fund sectors. The high percentage of 89% also clearly indicate shariah-compliant securities outnumber the non shariah-compliant securities. It is not surprising to see sectors such as hotels being excluded as this sector normally engages in non-permissible activities by shariah principles for example gambling, liquor, entertainment, etc.

Table 1.2 reported the data and statistic of shariah-compliant securities as at September 2010 and September 2011.

Table 1.2: Shariah-compliant Securities for the Third Quarter of September 2010 and 2011

	Sept 2011	Sept 2010
Number of Shariah-compliant securities	847	847
% to total listed securities	89%	89%
Latest market capitalization: Shariah-compliant (RM billion) Total market (RM billion) % of shariah-compliant securities to total market	 723 1, 172 62%	 719 1, 150 63%

The Shariah Advisory Council of the Securities Commission releases the updated Shariah-compliant securities list twice a year in May and November
Source: Quarterly Bulletin of the Malaysian Islamic Capital Market by Securities Commission of Malaysia for the third Quarter 2011

It shows that companies with a total market capitalization of RM723 billion in September 2011 are shariah-compliant. Most tradable shares of large companies in Malaysia adhere to shariah principles which make up 62% of the total market capitalization.

Shariah Screening Process in the Malaysian Capital Market

Prior to 1996, the development of the Islamic Capital Market (ICM) in Malaysia is still lethargic with no assessment from the Securities Commission (SC) of Malaysia on securities that tend to be shariah-compliant. Thus under Section 18 of the Securities Commission Act 1993, SC took steps by introducing the Shariah Advisory Council (SAC) in June 1996 to review and provide guidelines on all matters relating to the ICM to ensure conformity with the shariah principles (Securities Commission Act 1993).

The SAC introduced the first list of shariah securities in June 1997 and updates the list twice a year in May and November. These securities include ordinary shares, warrants and transferable rights. In order to determine whether firms are shariah-compliant, their primary business and investment activities will be assessed by the SAC from time to time. These includes such as obtaining the company's annual reports, specific inquiries made by companies' management and through the survey forms. Hence, the SAC has established standard criteria to review the companies' activities. Table 1.3 below list the core activities that are non-permissible by shariah principles.

Table 1.3: Core Activities that are non-permissible by Shariah Principles

Practicing *riba* (interest) Gaming and gambling	Stockbroking or share trading in non shariah-compliant securities
Manufacture or trade in non-halal productsor related products	Other activities deemed non-permissible by shariah
Conventional insurance Entertainment activities that are non-permissible by shariah	Manufacture of or trade in tobacco-based products or related products

Source: Securities Commission of Malaysia

Therefore, companies engaged in the core activities as listed in Table 1.3 are considered as shariah non-compliant. Furthermore, the SAC also considers two additional criteria for both permissible and non-permissible activities. Table 1.4 lists the two additional criteria.

Table 1.4: Additional Criteria for both Shariah Permissible and Non-permissible Activities

To consider the public perception or image of the company must be good
Core activities of the company are important and benefited the Muslim nation and country

Source: Securities Commission of Malaysia

In addition, the non-permissible element should be very small, immaterial and difficult to avoid and also take into account the rights of non-Muslim which are accepted by Islam. Besides, the SAC also assessed the level of interest income or other interest bearing financial instruments and dividend received from investment made in shariah non-compliant securities. At the same time, the SAC do establish benchmarks according to the *ijtihad* (reasoning from the source of shariah by qualified shariah scholars) to determine the acceptable level of mixed contribution between permissible and non-permissible activities. The companies' turnover and profit before tax which exceed these benchmarks will be classified as non shariah-compliant. The benchmark imposed by the SAC is illustrated in the Table 1.5 below.

Table 1.5: Benchmark Imposed by the SAC against Companies

Benchmarks	Assessment against companies
The 5% benchmark	Companies with level of mixed contributions from activities that are clearly prohibited for example *riba*, liquor, pork and gaming.
The 10% benchmark	Companies with level of mixed contributions from activities involve *umum balwa* that is a prohibited element affecting most of the people and difficult to avoid for example interest income from fixed deposits, tobacco-related activities, etc.
The 20% benchmark	Companies with level of contributions from mixed rental payments derived from non shariah-compliant activities such as rental payment from premises involved in gambling, liquor, etc.
The 25% benchmark	Companies with level of mixed contributions from activities that are generally permissible by shariah and have the element of *maslahah* (reasoning to prohibit or permit something based on the public's benefit), but there are other elements which may affect the shariah status of these activities. For example hotel and resort, share trading, stockbroking, etc.

Source: Securities Commission of Malaysia

This screening process clearly differentiates shariah-compliant from non shariah-compliant companies. However, the historical development of securities with shariah-approval is increasing over time since it was first introduced in June 1997.

There are reasonable phenomena to support this. McGowan Jr and Muhammad (2010) claimed that companies tend to retain their certification status as shariah-approved securities as a strategy to retain their present investor(s) and to increase their market from non-shariah based investor(s). Furthermore, Bercicci et al. (2001) argued that ethical investment is a good technique to provide an avenue for investment opportunity for companies that are currently undervalued.

Rational for the Study

In the Malaysian capital market, companies that are shariah-compliant and non shariah-compliant securities have clearly engaged in different kinds of business and investment activities; thus the associated risks and returns would be expected to differ.

For example, the characteristics of mutual funds and stocks have set them apart against each other. As per definition, mutual funds are characterized by holding a group of stocks, bonds and securities in hoping to earn higher return. However, an individual stocks' investor purchases shares from a respective single company. If the value of the shares falls, the individual stock investor will have to face losses. Nevertheless, a mutual funds investor has advantages to marginally cover their losses from the underperforming stocks with the other stocks that has performed well. Hence, the risks and returns between these two types of investment are expected to be different. Another plausible explanation is that the performance of mutual funds is also dependent to the large extent of the fund managers' ability. To conclude, such mutual funds performances may not resemble the performance of the entire market of Islamic securities.

Changes in the economic environment also give another additional impact to the performances of Islamic and Conventional investments. As reported by Abdullah et al (2007) in the Malaysian market scenario, Islamic mutual funds tend to beat conventional funds during the AFC but underperformed in pre AFC. Yet, the performance of shariah-compliant and non shariah-compliant securities would not echo mutual funds before, during or after the AFC.

It would be premature and unwise to conclude any outperformances or underperformances without direct analysis on the comparative performances of shariah-compliant and non shariah-compliant securities. In view of the fact that Islamic investments tend to outperform the conventional investment using the traditional portfolio performance measurement, the findings merely emphasize only the mutual funds alone. In the context of this study, this paper tries to fill the gap by investigating the performance of shariah-compliant and non shariah-compliant securities not only from the general perspective over the whole period but also to include the impact from the Asian Financial and Subprime Mortgage Crises in the Malaysian capital market. Hence, this paper has three main objectives. First, is to investigate whether there are significant differences in the performance of shariah-compliant and non shariah-compliant portfolios in the Malaysian capital market. Secondly, to examine whether there is a significant difference in the performances of shariah-compliant and non shariah-compliant portfolios for the period of pre AFC, during AFC, post AFC, Subprime Mortgage

Crisis and the entire period. The final objective is to investigate whether there is a significant difference in the performance of shariah-compliant and non shariah-compliant portfolios in the Malaysian capital market between different sub periods of:

1. Pre AFC vs. During AFC
2. Pre AFC vs. Post AFC
3. Pre AFC vs. Subprime Mortgage Crisis
4. During AFC vs. Post AFC
5. During AFC vs. Subprime Mortgage Crisis
6. Post AFC vs. Subprime Mortgage Crisis

This remainder of this paper is organized as follows. The next section will provide a review of literature on the theory of risk-return and performance measurement together with performance of Islamic and conventional investments. Section three meanwhile describes the methodology. Section four reports the empirical results, analysis and discussions. This paper concludes with implications and limitations of the study.

Review of Previous Studies

Risk-return Trade-off and Performance Measurement: Theory

The foundations of modern portfolio theory have been laid by Harry Markowitz or Markowitz (1952). In his model, an investor is assumed to be risk-averse, that is minimizing the variance of portfolio return for a given expected return and maximizing the expected return for a given variance of portfolio. Principally, the concept behind this model is that the risk-return trade-off is the same for all investors; however the risk-averse characteristic has caused them to behave differently. Fama and French (2004) called the Markowitz model as “mean-variance” approach.

Based on the modern portfolio theory, scholars such as Sharpe (1964), Lintner (1965) and Mossin (1966) in 1960s have developed the Capital Asset Pricing Model (CAPM) which provided a mechanism on the relationship between the risky assets and the expected return. Sharpe (1964), Lintner (1965) and Mossin (1966) in their study from the application of the CAPM

model provided five assumptions. The assumptions were a) investors were assumed to be risk averse, b) investors were assumed to have identical expectations with respect to investment opportunities, c) investors were assumed free to choose among portfolios based solely on the variances of returns and expected returns, d) zero for all transactions costs and taxes and e) infinitely divisible for all assets (Jensen, 1968). The assumption that the capital market was in equilibrium together with the additional five assumptions, the CAPM mathematically yielded the following equation:

$$E(R_i) = R_f + \beta_i[E(R_m) - R_f] \qquad \text{(Equation 2.1)}$$

Where;

$E(R_i)$	= Expected return of security *i*
R_f	= Risk-free return of the asset
β_i	= Systematic risk
$E(R_m)$	= Return of the market portfolio
$E(R_m) - R_f$	= Risk premium of the market portfolio

The above equation impliy that the investor will earn expected return for $E(R_i)$ a given systematic risk β_i that was proportionate to the market sensitivity. In this case, if the portfolio managers or security analysts were able to predict the future security prices, they were able to earn higher expected returns than those in (Equation 2.1) (Jensen, 1968). Literature in finance, accounting and economics call this phenomenon as Efficient Market Hypotheses (EMH), which is the sensitivity of expected securities prices as fully reflected by the available information.

Performance of Ethical and Non-Ethical Funds

Prior to the 1990s, the superior performance of social or ethical funds relative to the conventional funds has been documented by Hylton (1992) and (Hickman et al., 1999). However, their consistent result seemed to hold true in practice only for a certain economic period. As such, the statistical result would be dependent on the economic period in which the performance analysis was conducted. Subsequently, Cooper and Schelegelmich (1993) claimed that the mixed result of comparative performances between social

or ethical funds with the Financial Times All Share Index was inconclusive depending on the analysis of the time period concerned. Mallin et al. (1995) revealed the tendency of social or ethical funds to perform better than its counterparts. Later in early 2000s, similar findings on equal asset-size basis were reported by (Statman , 2000). However, their findings were weak. Scholars such as Hamilton et al (1993) meanwhile documented insignificant evidences of ethical funds to perform differently from conventional portfolios. This was also supported by other studies by Reyes and Grieb (1998) and (Teper, 1991). In the Canadian capital market, Asmundson and Foerster (2001) tried to investigate the performances of 24 Socially Responsible Investing (SRI) funds and the conventional index namely Toronto Stocks Exchange (TSE) 300 Total Return Index. They indicated that the performances of SRI funds and conventional funds to be insignificantly different, yet the SRI funds seemed to have a lower risk exposure.

In the meantime, Gregory et al. (1997) employed size-adjusted as a measure of return performance between Ethical and Non-ethical funds in the U.K. The results showed an insignificant difference implying that both funds underperformed the FTSA Index. However, while results revealed that size became an important factor to influence the alpha values of each funds, the funds' size and ethical status appeared to be insignificant. Their study was in lieu of (Mallin et al., 1995). An investigation of three major public ethical investment funds in Australia in the meantime documented under performances of ethical funds relative to the market index (Tippet, 2008).

Performance of Islamic and Conventional Investment

Most of the prior studies focused on the performances of Islamic and conventional mutual funds and yet it has been discussed thoroughly worldwide. However, little is known about the performances of shariah-compliant and non shariah-compliant securities. In 1990s, Johnson and Neave (1996) provided evidence of shariah-compliant securities yielding lower expected returns than the non shariah-compliant investments. Researches such as Elfakhani et al (2005) and Elfakhani and Hassan (2005, 2007) after that investigated the performances of Islamic mutual funds for the period of 1st January 1997 to 31st August 2002 for the sample of 46 Islamic mutual funds. They reported insignificant differences between the Islamic mutual funds to their respective market index.
On top of that, Elfakhani et al (2005) and Elfakhani and Hassan (2005,

2007) also documented Islamic mutual funds to outperform during bearish market while conventional mutual funds showed better performance in bullish market. While the result was insignificant, the risk-adjusted abnormal reward or penalty associated with investing in Islamic mutual funds was suggesting that investors can consider shariah-compliant investment as one of their investment portfolio decisions especially during the recession period (Elfakhani et al., 2005 and Elfakhani & Hassan , 2005, 2007). Yet, the possibility of bias could exist as their time interval of their study was short. However, Elfakhani and Hassan (2005) claimed the Islamic investments were still at its early growth stage with limited diversification and poor transparency in portfolio funds and the fund managers still lacked experience during the period of study.

Also Rahimie Abd Karim (2010) further argued that the potential earnings in terms of dividend and stock price performances of shariah-based portfolios were rather unstable and normally the volatility was high due to its initial growth stage during 1990s. Yet, fund managers were gaining more experience and sense of the market as the Islamic mutual funds' performance was improving over time (Elfakhani & Hassan, 2005 and (Elfakhani et al, 2005).

As a matter of concern with respect to the time period, Sadeghi (2008) investigated the introduction of shariah-compliant stocks into the Islamic Index by Bursa Malaysia. Mean Cumulative Abnormal Returns (MCARs) on the days surrounding the event has been employed as an event methodology. Thus, the inclusion of shariah-compliant stocks into the Islamic Index then gave positive impact on their performances. At the same time, the return and liquidity of shariah-compliant stocks for short and long terms was increased. Sadeghi (2011) then further extended the similar research on the evidence from Egypt and Jordan over the period of January 2008 to December 2009. The result was consistent with the findings from the Malaysian capital market scenario. This suggested the importance of the period when the shariah-compliant security was introduced to the market. In addition, Elfakhani and Hassan (2005) and Elfakhani et al, (2005) also supported her studies by claiming the improvement in the performance of Islamic mutual funds over time. McGowan Jr and Muhammad (2010) meanwhile witnessed stock price to be positively and negatively reacted to the respective inclusion and exclusion of shariah-approved stocks in the

Kuala Lumpur Shariah Index (KLSI). According to Abderrezak (2008), the performance between Islamic and ethical funds is comparable using the Fama's performance measurement. Moreover, Merdad et al. (2010) had put an effort to examine the risk-return behavior of 12 Islamic and 16 non-Islamic mutual funds in Saudi Arabia. Performance measurement such as Jensen Alpha, Treynor Index and Sharpe Index has been employed for comparative performances. They revealed Islamic funds tend to perform better than the conventional funds in bearish and the recent Asian Financial Crisis period but they underperformed conventional funds during bullish and whole period. They also witnessed Islamic investment as a good hedging opportunity for investors during the economic downturns due to the shariah principle which restrict the Islamic portfolio selection. Similarly, Alam and Rajjique (2010) in their investigation in the European capital market tabled outperformances of shariah-compliant equities during economic slowdowns but underperformed during economic booms.

Our study would then move to the scenario, findings and evidences from the Malaysian capital market. Among them were Shamsher et al (2000) who conducted a study to compare the performances of 41 active and passive funds in Malaysia during the period 1995 to 1999 using various performance measurements. They revealed active funds performed no better or worse than the passive funds and both funds underperformed the KLCI benchmark. Hayat (2006) later on provided evidence of significant outperformances of Islamic funds as compared to Islamic and conventional market during the bearish market of 2002. However Hayat and Kraeussl (2011) in their recent study for the whole period of January 2000 to February 2009 reported opposite results where Islamic funds underperformed both the KLSI and KLCI respectively. Hence, once again, investigation of the economic period concerned does play a role in tabulating different statistical results.

Abdullah et al. (2007) merely analyzed the comparative performance of 65 unit trust funds for both Islamic and conventional mutual funds from January 1992 until December 2001. Adjusted Sharpe's Index, Adjusted Jensen's Alpha Index, Treynor Index, Modigliani measures and the Information Ratio were employed for comparative performance analysis. The sample of Asian Financial Crisis has been split into pre, during and posts Asian Financial Crisis. They found out that Islamic funds outperform in bearish market (during AFC) while conventional funds outperform in

bullish market (pre AFC). Islamic funds also seemed to be less volatile as compared to conventional funds as measured by beta relative to the changes in economic cycle. While Mohd Hasimi and Noor Azuddin (2002) and Mohd Azlan et al (2004) concluded the outperformances of Islamic against the conventional funds and market benchmark, Abdullah et al (2007) also documented similar results. However, Muhammad and Mokhtar (2008) have concluded otherwise.

In identifying the distinguishing factors in the risk and return characteristic between shariah-approved and conventional portfolios, Rahimie Abd Karim (2010) took another approach by utilizing the hypothetical or portfolio simulation. In general, he claimed that shariah-approved portfolios yield lower returns as compared to the conventional portfolio. According to Rahimie Abd Karim (2010), the firm size effect did influence their performance as such shariah-approved portfolios were not supported by large capitalized and diversified business interest than the conventional portfolios.

An analysis on the non-risk adjusted return on the 128 Islamic and 350 conventional mutual funds for the period January 1996 to April 2009 discovered that Islamic-based portfolios provide slightly less returns as compared to conventional counterparts (Mansor and Bhatti, 2011a). The significant differences in their standard deviations showed Islamic-based portfolios to be riskier than conventional portfolios. Moreover in the year 2011, the risk-adjusted return performance measurement such as Jensen, Sharpe and Treynor witnessed the outperformances of Islamic mutual funds to beat its conventional peers and the market return proxied by KLCI (Mansor and Bhatti, 2011b). They used a similar sample number of mutual funds as in (Mansor and Bhatti, 2011a). After that Mansor and Bhatti (2011c) extended their analysis into bullish and bearish market period. Consistent with Mansor and Bhatti, (2011b), both Islamic and conventional funds outperformed the KLCI return. The Islamic funds also appeared to be equally performing as conventional funds during bullish, bearish market trends and the whole period. Bashir and Nawang (2011) then documented similar findings of comparable return performances between Islamic and conventional funds. However Abdullah et al (2007) reported otherwise which witnessed the outperformances of Islamic mutual funds than its peers during bearish market.
Saad et al (2010) meanwhile adopted Data Envelopment Analysis (DEA)

to provide evidence of efficiency of unit trust companies in Malaysia. He witnessed some of the Islamic unit trust companies outperformed their conventional peers for the periods 2002 to 2005. Apart from that, insignificant differences in returns between the shariah-compliant and non shariah-compliant securities listed in Bursa Malaysia were then reported by (Albaity and Ahmad , 2011). However, their study was merely focused on investigating whether both shariah-compliant and non shariah-compliant securities react differently to firm specific variables such as total debt, price-earnings ratio, market risk, market capitalizations and market-to-book-ratio. In terms of the relationship between risk and return of Islamic unit trust, conditional CAPM and cross-sectional analysis discovered that beta was higher in a downmarket than in the upmarket implying that beta can be used as an appropriate measurement tools for the market risk (Ismail and Shakrani, 2003). Moreover, Karim et al (2010) provided evidence of negative average returns of Islamic stock market in their investigation during the period of Subprime Mortgage Crisis in Malaysia. Finally, the most recent study by Mansor et al (2012) in adopting the panel data analysis found that Islamic funds to perform no better or worse as for market benchmark.

Data and Methodology

Selection of the Sample and Matching Process

The approved updated list of shariah-compliant securities were identified and sourced from the Shariah Advisory Council (SAC) of the Securities Commission of Malaysia (SC). Shariah-compliant securities made up 89% leaving 11% for non-shariah compliant securities. The total numbers of securities as at 25 November 2011 are 946. 839 of them are shariah-compliant while 107 are non-shariah compliant (Securities Commission of Malaysia, 2011).

The selection and the matching process were conducted in the following manner. First, 31 January 1990 is chosen as the beginning point while 31 December 2011 is chosen as the ending point so that this study will have complete monthly data until fiscal year end 2011. The cut-off point on 31 December 2011 is in conjunction with the release of shariah listing securities by SAC. To serve the purpose of pair-size matching, the value of market capitalization of each 107 non shariah firms on 31 December 2011 will be

used as size criterion to select the other 107 from out of a total 839 shariah firms. This is in lieu with the characteristic-matching for comparison purpose (Daniel et al., 1997 and Albaity and Ahmad, 2011). Hence, non shariah firms should have market capitalization close to shariah firms.

The computation of market size of both firms in the portfolio is equal to the natural logarithm of the total market capitalization in millions of ringgit on 31 December 2011. It is calculated as follows:

Market Size = LN (Market Capitalization on 31 December 2011)
Market Capitalization = Number of Shares Outstanding X Current Price of the Stocks.

Table 3.1 below displays the total average market capitalization as at 31 December 2011 for both 107 shariah and non shariah firms.

Table 3.1: Average Market Capitalization as at 31 December 2011

Firms	No. of firms	Average Market Capitalization as at 31 Dec 2011 (RM' million)
Shariah	107	4051.10
Non shariah	107	3958.95
Total	**214**	**8014.38**

The pair-size matching in Table 3.1 appeared to provide a fit and sound comparison. The percentage average total market capitalization of non shariah firms relative to the shariah firms is 97.73%. As a result, this study formed two portfolios as follows:

1. Shariah-compliant portfolios consist of all 107 shariah-compliant securities listed in the Bursa Malaysia
2. Non shariah-compliant portfolios consist of all 107 non shariah-compliant securities listed in the Bursa Malaysia

The Split of Sample Periods into Different Sub Periods

The time interval used in this study is 22 years starting from 31 January 1990 until 31 December 2011. The sample period is then split according to the Table 3.2. The period of pre AFC is referred to as period before

the Asian Financial Crisis whereas post AFC is a period after the Asian Financial Crisis.

Table 3.2: Sub Period of Asian Financial Crisis, Subprime Mortgage Crisis and Whole Period

Different Sub Periods	Periods
Pre AFC	January 1990 – May 1997
During AFC	June 1997 – August 1998
Post AFC	September 1998 – May 2007
Subprime Mortgage Crisis	August 2007 – May 2008
Overall period	31 January 1990 – 31 December 2011

Measuring Return

Data for the current study comprise monthly closing prices for shariah-compliant and non shariah-compliant securities, the Kuala Lumpur Composite Index (KLCI) and Treasury bills taken from Data Stream for the period of 31 January 1990 to 31 December 2011. Moreover, the monthly risk-free rate is proxied by the 3-months Treasury Bills by Bank Negara. Raw monthly return for each shariah-compliant and non shariah-compliant security is calculated as follow:

$$R_{it} = \text{LN}\,(P_{it}) - \text{LN}\,(P_{it-1}) \qquad \text{(Equation 3.1)}$$

Where;

R_{it} = Monthly return of individual securities *i* at time *t* for each category (shariah-compliant or non shariah-compliant)

LN (P_{it}) = Natural logarithm of monthly closing price of individual securities *i* at time *t* for each category (shariah-compliant or non shariah-compliant)

LN (P_{it-1}) = Natural logarithm of monthly closing price of individual securities *i* at time *t-1* for each category (shariah-compliant or non shariah-compliant)

The difference in natural logarithm between the current month and the

previous month is the raw monthly return of individual securities. Average return is then mathematically computed as below:

$$\overline{R}\,it = \frac{1}{n}\sum_{i=1}^{n} R_{it} \qquad \text{(Equation 3.2)}$$

Where;

$\overline{R}_{it}$	=	Monthly mean return of the securities *i* at time *t* for each category (shariah-compliant or non shariah-compliant)
R_{it}	=	Monthly total return of securities *i* at time *t* for each category (shariah compliant or non shariah-compliant)
n	=	Number of securities for each category (shariah-compliant or non shariah-compliant)

Bursa Malaysia launched the Kuala Lumpur Stocks Exchange Shariah Index (KLSI) in April 1999 to serve as a benchmark on the performance of shariah-compliant counters. However in this study, Kuala Lumpur Composite Index (KLCI) will be employed as a proxy for market benchmark. FTSE Bursa Malaysia KLCI previously known as KLCI was introduced much earlier before in 1986. Thus, the KLCI allow the study to captured longer historical performances of both portfolios. Using the same calculation as in (Equation 3.1), the monthly market return of KLCI is computed as follows:

$$R_{mt} = \text{LN}\,(M_t) - \text{LN}\,(M_{t-1}) \qquad \text{(Equation 3.3)}$$

Where;

R_{mt}	=	Monthly market return of KLCI at time *t*
LN (M_t)	=	Natural logarithm of monthly KLCI Index at time *t*
LN (M_{t-1})	=	Natural logarithm of monthly KLCI Index at time *t-1*

This study also computes the average raw return for each shariah-compliant and non shariah-compliant security over the whole period as well for the respective period of pre AFC, during AFC, post AFC and Subprime Mortgage Crisis.

Measuring Performance

Two standard performance measurements of Jensen Alpha Index and Treynor Index will be employed to investigate the performance of both shariah-compliant and non shariah-compliant portfolios. The same approach however is adopted by Abdullah et al, (2007) and Mansor and Bhatti (2011c) in analyzing the performance of Islamic and conventional mutual funds in the Malaysian capital market in different economic cycles of pre AFC, during AFC and Post AFC.

Jensen Alpha

The application of CAPM model which used the intercept alpha to measure the abnormal performance has been introduced by Jensen (1968). It measures the average returns on a portfolio over and above the estimated return predicted by the CAPM, to the given portfolio's beta and average market return (Bodie et al, 2010 p. 197). Modigliani and Pogue (1974) posited that a positive value of alpha inferred superior performance while a negative value was an implication of inferior performance. The alpha value in this model indicates the average portfolio returns adjusted for risk. The formula for Jensen Alpha is as follow:

$$\alpha_i = AR_{it} - [ARFR + \beta_i(R_m - ARFR)] \qquad \text{(Equation 3.4)}$$

Where;

AR_{it}	=	Monthly mean return of the portfolio *i* at time *t* for each category (shariah-compliant or non shariah-compliant)
$ARFR$	=	Mean risk-free rate as measured by the monthly 3-months Treasury Bills rate by Bank Negara
α_i	=	Portfolio α value
β_i	=	Beta of the KLCI market Index which has been estimated using the single index regression model
R_m	=	Monthly market return of KLCI (the benchmark in this study)
$R_m - ARFR$	=	Market risk premium

Treynor Index

Treynor (1965) developed a technique to measure the portfolio average excess return by using the beta portfolio. This ratio will take into account the beta to measure the systematic risk instead of total risk (standard deviation) as used in calculating the other performance measurement known as Sharpe Index. According to Merdad et al. (2010), Treynor ratio provides better performance measurement as compared to Sharpe ratio because the former was often used to assess the performance of a portfolio or fund that was a part of a larger fully diversified investment portfolio.

The reason is if the funds have identical systematic risk but different total risk, they will be ranked equally if it is not part of the large diversified portfolio. At the same time, total risk also tends to be diversified away in a larger diversified portfolio. Thus, Bodie et al (2010 p. 584) argued that the mean excess return should be evaluated against the systematic risk rather than the total risk. Therefore, this ratio measures the portfolio performance on the systematic risk by dividing the mean excess return of a portfolio to its beta. Reilly and Brown (2006) inferred better performance of a portfolio with higher value of Treynor ratio and vice versa. Treynor's technique is then calculated as follow:

$$\text{Treynor Index} = \frac{\overline{R} - \overline{R}_{rf}}{\beta} \qquad \text{(Equation 3.5)}$$

Where;

$\overline{R}$	=	Monthly mean return of the portfolio over the evaluation period for each category (shariah-compliant or non shariah-compliant)
$\overline{R}_{rf}$	=	Mean risk-free return over the evaluation period (monthly 3-months Treasury Bills) by Bank Negara
β	=	Beta of the portfolio over the evaluation period for each category (shariah-compliant or non shariah-compliant) which has been estimated using the single index regression model

Measuring Systematic Risk

The single index regression model from the empirical version of Capital Asset Pricing Model (CAPM) is employed in order to analyse the relationship between risk and return of stocks. This model was discussed by Henry Markowitz but rather popularized by Sharpe (1966). Bodie et al. (2010, p. 167) argued that single index regression model can be used to calculate the beta of a portfolio. Therefore, beta is computed according to the following equation:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \qquad \text{(Equation 3.6)}$$

Where;

R_{it}	=	Monthly return of the individual securities *i* at time *t* for each category (shariah-compliant or non shariah-compliant)
α_i	=	Alpha intercept term
β_i	=	Parameter that measure the sensitivity of R_{it} to the R_{mt}
R_{mt}	=	Monthly market return of KLCI at time *t*
ε_{it}	=	Error term

In this model, the individual securities return will be the dependent variable whereas the KLCI market return is the independent variable. Each of the individual securities return for both shariah-compliant and non shariah-compliant portfolio will be regressed against the KLCI market return in order to obtain the beta coefficient.

However before running the single index regression model, it is important to ensure whether the time series data is stationary or not so that the statistic data such as means and variances is meaningful. The inferences of the results would be misleading if the problems of the unit root test have not been properly taken care of (Albaity and Ahmad, 2011). To serve this purpose, this study runs Augmented Dickey-Fuller Unit Root Test on t-series. Table 3.3 display the results of Unit Root Test on average monthly raw return for all sample of both shariah-compliant and non shariah-compliant portfolio.

Table 3.3: Unit Root Test for Both Shariah-compliant and Non Shariah-compliant Portfolio (Average Monthly Raw Return)

Portfolio	Intercept	Trend and intercept	None
Shariah-compliant	-14.47***	-14.44***	-14.50***
Non shariah-compliant	-14.60***	-14.57***	-14.63***

Notes: The asterisks *** indicates significant at 1% level

Table 3.3 shows that stationary data exist as the mean of the data are zero and variance remains constant over the period of 22 years. Thus, the null hypothesis which posit the existence of the unit root test can be rejected.

Results and Discussion

Descriptive Statistic

Table 4.1 presents the descriptive statistic which involved 264 observations of average raw monthly return for the period of 31 January 1990 to 31 December 2011. The mean return for the shariah-compliant securities is 0.0933% whereas non shariah-compliant is 0.1234% indicating that the latter is superior to the former.

The standard deviation of the particular return for the shariah-compliant and non shariah-compliant is 9.240% and 9.599% respectively signaling that non shariah-compliant is relatively more risky and volatile than its counterparts. This is consistent with the risk-return trade-off theory which posits risky investment will be compensated with higher return.

Table 4.1: Descriptive Statistic of the Average Raw Monthly Return (1990 –2011)

	Descriptive Statistic (Average Raw Monthly Return)	
	Shariah-compliant	**Non shariah-compliant**
Mean	0.000933	0.001234
Median	0.001625	0.002553
Maximum	0.3896	0.4148
Minimum	-0.3663	-0.3689

Std. Dev.	0.09240	0.09599
Skewness	-0.050	0.223
Kurtosis	3.236	3.230
Observations	264	264

In addition, both portfolios have excess kurtosis that is slightly above three, suggesting higher peaks and thicker tails.

Differences in Systematic Risks

Regressing the return of each security to the return of KLCI results in the beta coefficient. Table 4.2 tables the result of beta coefficients in different sub periods of observations.

Table 4.2: Beta Coefficients of the Shariah-compliant and Non Shariah-compliant portfolios

	Beta				
Portfolio	**Pre AFC**	**During AFC**	**Post AFC**	**Subprime Mortgage Crisis**	**Overall**
Shariah- compliant	0.665488	0.709064	0.912285	0.993624	0.672215
Non Shariah-compliant	0.907299	0.806841	1.029436	0.888439	0.828570
Mean Difference	-0.241811	-0.097777	-0.117151	0.105185	-0.156355
t-statistic	(-2.566)**	(-1.054)	(-1.215)	(0.840)	(-2.202)**

Notes:
i. The asterisks ***, ** and * indicates significant at 1%, 5% and 10% respectively (2-tailed)
ii t-statistic in parentheses indicates t-value significant at 1%, 5% or 10%

Table 4.2 illustrated that the non shariah-compliant portfolio is significantly more risky than its peers in pre AFC. The periods during AFC, post AFC and Subprime Mortgage Crisis meanwhile posit resemblances in their systematic risk between both portfolios. Over the 22-year periods, the sensitivity and volatility of non shariah-compliant portfolios towards to the changes of economic cycle in the Malaysian market is significantly more sensitive as compared to its counterparts. Such results are not surprising given that non shariah-based portfolio is attributed mainly to the large capitalized stocks with diversified business interest invested in sectors such as conventional finance, conglomerates and cash-rich gaming. These sectors normally offer

wide availability of high investment grade, together with increased volatility in their investment returns. Likewise, investment in shariah-compliant securities are restricted and must not directly or indirectly involve activities such as liquor, gambling, usury, uncertainty elements, etc. Thus, shariah-compliant securities are seen as being more secure for long term investment portfolios with less risk than their peers.

Non-risk Adjusted Average Return

The non-risk adjusted average monthly return for both shariah-compliant and non shariah-compliant portfolios are summarized in Table 4.3. For comparison purpose, market return proxied by the KLCI is also reported.

Table 4.3: Non-risk Adjusted Average Monthly Return for both Shariah-compliant and Non Shariah-compliant Portfolio in Relation to the KLCI Market

Portfolio	Non-risk Adjusted				
	Pre AFC	During AFC	Post AFC	Subprime Mortgage Crisis	Overall
Shariah-compliant *t-statistic*	0.011188 (1.272)	-0.107682 (-2.301)**	0.009074 (1.083)	-0.023691 (-1.219)	0.000933 (0.164)
Non Shariah-compliant *t-statistic*	0.013511 (1.358)	-0.114360 (-2.432)**	0.007789 (0.916)	-0.021513 (-1.260)	0.001234 (0.209)
Market (KLCI) *t-statistic*	0.007589 (1.056)	-0.086267 (-2.381)**	0.014211 (2.149)**	-0.007371 (-0.475)	0.003794 (0.841)

Notes:
i. The asterisks ***, ** and * indicates significant at 1%, 5% and 10% respectively (2-tailed)
ii. t-statistic in parentheses indicates t-value significant at 1%, 5% or 10%

According to Table 4.3, the financial market is badly affected during the AFC and this is reflected by the significant negative values of non-risk adjusted average monthly returns of the KLCI and both portfolios.

Both portfolios also appeared to be significantly underperforming in the KLCI market during the AFC. Substantial changes in the volatility of the financial market during economic downturns have negatively affected investor confidence mainly the risk-averse investor. Since the volatility in the stock market is synonymous with risk, the cost of the capital has deepened impact to the investors' decision on their investment portfolio.

In addition, the significant positive value of the KLCI reported the highest level of average monthly non-risk adjusted returns. It shows that the KLCI has recovered gradually from the previous AFC crisis in 1997. However, the performances of both portfolios are no more favorable as compared to the KLCI market.

Performance between Shariah-compliant and Non Shariah-compliant Portfolio in Different Sub Periods

Table 4.4 summarized the performance analysis between shariah-compliant and non shariah-compliant portfolio in different sub periods.

Table 4.4: Mean Risk-adjusted Returns between Shariah-compliant and Non Shariah-compliant Portfolios during Different Sub Periods

Period	Portfolio	Mean Risk-adjusted Return	
		Jensen Alpha	Treynor Index
Pre AFC	Shariah-compliant	0.006137	0.016811
	Non Shariah-compliant	0.006625	0.014891
	Mean Difference	-0.000488	0.001920
	t-statistic	(-0.071)	(0.112)
During AFC	Shariah-compliant	-0.064023	-0.236742
	Non Shariah-compliant	-0.056381	-0.216329
	Mean Difference	-0.007641	-0.020413
	t-statistic	(-0.195)	(-0.222)
Post AFC	Shariah-compliant	-0.006509	-0.022780
	Non Shariah-compliant	-0.005961	-0.021436
	Mean Difference	-0.000548	-0.001344
	t-statistic	(-0.094)	(-0.111)
Subprime Mortgage Crisis	Shariah-compliant	-0.016584	-0.058102
	Non Shariah-compliant	-0.018762	-0.062529
	Mean Difference	0.002178	0.004427
	t-statistic	(0.204)	(0.161)
Overall	Shariah-compliant	-0.008518	-0.029932
	Non Shariah-compliant	-0.005519	-0.023921
	Mean Difference	-0.003000	-0.006011
	t-statistic	(-0.657)	(-0.515)

Notes:

i. The asterisks ***, ** and * indicates significant at 1%, 5% and 10% respectively (2-tailed)

ii. t-statistic in parentheses indicates t-value significant at 1%, 5% or 10%

The statistical result revealed statistically insignificant difference in the performance between shariah-compliant and non shariah-compliant portfolios for the period of pre AFC, during AFC, post AFC, Subprime Mortgage Crisis and the whole period. It can be inferred that shariah-compliant equally performed as non shariah-compliant portfolios. Hence, the analysis failed to reject the null hypothesis of no significant difference in the performance between shariah-compliant and non shariah-compliant portfolio in Malaysian capital market. This also suggests that the penalty associated for investment made in shariah-compliant portfolios as compared to non shariah-compliant securities is non-existent.

Comparative Performance of Shariah-compliant and Non Shariah-compliant Portfolio in Different Sub Periods

Table 4.5 meanwhile reported the significant difference, thereby rejecting the null hypothesis which posits no significant difference in the performance of shariah-compliant and non shariah-compliant portfolios in the Malaysian capital market.

Table 4.5: Mean Risk-adjusted Returns of Shariah-compliant and Non Shariah-compliant Portfolio during Different Sub Periods

Different Sub periods	Mean Risk-adjusted Return			
	Shariah-compliant		Non Shariah-compliant	
	Jensen Alpha	Treynor Index	Jensen Alpha	Treynor Index
Pre AFC	0.002722	0.006964	0.005170	0.008572
During AFC	-0.064023	-0.236742	-0.056381	-0.216329
Mean Difference	0.066744	0.243706	0.061551	0.224902
t-statistic	(2.050)*	(2.751)**	(2.476)**	(3.019)***
Pre AFC	0.006137	0.016811	0.006625	0.014891
Post AFC	-0.009688	-0.027507	-0.007416	-0.024092
Mean Difference	0.015825	0.044319	0.014041	0.038983
t-statistic	(2.406)**	(2.707)***	(2.095)**	(2.763)***
Pre AFC	0.000064	-0.013314	0.002653	-0.010487
Subprime	-0.016584	-0.058102	-0.018762	-0.062529
Mortgage	0.016649	0.044787	0.021415	0.052042
Mean Difference	(1.004)	(0.901)	(1.407)	(1.295)
t-statistic				

During AFC	-0.064023	-0.236742	-0.056381	-0.216329
Post AFC	-0.003159	0.014602	0.001069	0.019103
Mean Difference	-0.060863	-0.251344	-0.057450	-0.235433
t-statistic	(-1.662)	(-3.442)**	(-1.641)	(-3.628)***
During AFC	-0.069960	-0.192326	-0.060243	-0.168327
Subprime Mortgage	-0.016584	-0.058102	-0.018762	-0.062529
Mean Difference	-0.05338	-0.134225	-0.04148	-0.105798
t-statistic	(-1.273)	(-1.317)	(-1.089)	(-1.173)
Post AFC	0.002340	0.053360	0.006336	0.056951
Subprime Mortgage	-0.016584	-0.058102	-0.018762	-0.062529
Mean Difference	0.018924	0.111462	0.025097	0.119480
t-statistic	(0.748)	(1.858)*	(1.000)	(2.231)*

Notes:
The asterisks ***, ** and * indicates significant at 1%, 5% and 10% respectively (2-tailed)
t-statistic in parentheses indicates t-value significant at 1%, 5% or 10%

According to the Table 4.5, both portfolios are significantly performing well in pre AFC as compared to during AFC. A plausible explanation is that the volatility of stocks during AFC has negatively affected the cost of capital and risk-averse investor decisions towards their investment assessment and leverage decision. This is in line with Abdullah et al (2007). While Abdullah et al (2007) reported better performances of shariah-compliant mutual funds during the AFC, our study reported otherwise where shariah-compliant securities tend to underperform during the AFC than the pre AFC. Yet, their findings are solely based on the investigation on the performance of Islamic and conventional mutual funds. The reason is that the investor of Islamic mutual funds during the economic downturns has an advantage to cover losses from the underperformances of stocks with the other stocks that perform well. However, the similar situation may not apply to individual Islamic stocks that solely depend on the companies' activities and investment performances from where the stocks were purchased. Moreover, the wide market and availability of conventional investment does allow non shariah-compliant securities to be invested in diversified business interests with high risk exposure. The investment choices of shariah-compliant securities meanwhile are restricted to shariah principle based only. Rahimie Abd Karim (2010) also claimed that shariah-approved stocks are still at its early growth stage in the business life cycle during mid-1990s, thus causing unstable potential earnings both in terms of dividend and stock price performance.

Both portfolios are significantly outperformed in pre AFC than post AFC. This is in line with the analysis done by Angabini and Wasiuzzaman (2010) which witnessed the Malaysian stock market to gradually recover by the middle of 1999 and almost recovered by the middle of 2000 even though the specific date of full recovery is not specific. In addition, the sensitivity of market movement during the AFC has significant negative impact to the performances of both portfolios as compared to post AFC

Besides, it is shown that the performances of both portfolios are significantly better in post AFC than the Subprime Mortgage Crisis period with positive mean risk-adjusted returns. The Subprime Mortgage Crisis in U.S adversely affected the general economy as a whole and investor confidence in various segments of the credit market for example leverage buy-out loans, corporate credit market and auction-rate securities (Crouhy et al., 2008). Another explanation is that companies are facing a decline in their lending composition due to the cut-off of credit by most of the banks in order to preserve their regulatory capital ratios. Such circumstances induce negative impacts to the economy.

Conclusion and Implication

The primary focus of the study is to empirically examine the performance of shariah-compliant and non shariah-compliant portfolios in different segments of the economic environment in Malaysia. In this regard, we conduct performance analysis of both portfolios over the period of pre AFC, during AFC, post AFC, Subprime Mortgage Crisis and the whole period. It is interesting to note that non-shariah-compliant portfolios are significantly more volatile and sensitive as compared to their peers in the period of pre AFC and the whole period. Both portfolios are also significantly underperformed the KLCI benchmark in the period of during AFC. In addition, the KLCI appeared to be recovering gradually in the post AFC with significant positive values after the financial market was badly affected in 1997. A relative measure on the mean risk-adjusted return shows insignificant difference, which inferred shariah-compliant portfolios to performed equally as for non shariah-compliant for the period of pre AFC, during AFC, post AFC, Subprime Mortgage Crisis and the whole period. Likewise, both portfolios are significantly outperformed in pre AFC for the period between pre AFC vs. during AFC and pre AFC vs. post AFC.

Moreover, our results also indicate better performance of both portfolios in the period of post AFC for comparative analysis between the period of during AFC vs. post AFC and post AFC vs. Subprime Mortgage Crisis. The findings from this study may have important implications to investors, regulators and market players in the future to plan ahead on their investment diversification especially during economic downturns. In view of the fact that most prior studies documented better performances of conventional mutual funds during the growing phase of economy, both shariah-compliant and non shariah-compliant securities also can be used as an opportunity as good substitutes as hedging instruments. A possible extension of the current studies is to employ another traditional performance measurement known as Sharpe Index which takes into account the total risk (standard deviation) instead of the systematic risk (beta). Besides, further extension might also consider the impact of recent Financial Crisis of 2008 to 2009 towards the performance of both portfolios.

Limitation of the Study

Out of the total listed companies in Bursa Malaysia on November 2011, only 214 securities were chosen representing 107 for both shariah-compliant and non shariah-compliant securities respectively. Another limitation is that the sample of 107 shariah-compliant securities represents 13% from out of total number of 839 securities. Thus, it may not represent the performances of shariah-compliant portfolio as one whole population. Nevertheless, the result from this study is proven applicable for comparison purpose in analyzing the performances of shariah-compliant and non shariah-compliant portfolios.

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