UNIVERSIDADE CATÓLICA PORTUGUESA

Efficiency of Bursa Malaysia: Analysing Islamic Indices and their Counterparties

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by

Abdul Latif Kabbani

Under the guidance of
Professor Ricardo Cunha
Professor Paulo Alvis

Universidade Católica Portuguesa – Porto – Faculdade de Economia e Gestão

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To the spirit of strength in my life ... to the meaning of love, compassion and dedication ... to the smile and joy of life and the mystery of existence… To whose praying was the secret of my way to success and her warm-heartedness is the cure of all affections ... to my dearest in this life... My dear mother.

To the person who taught me tender without waiting ... to whom I will always carry his name proudly to the end of my life … To whose words are the stars that guide me into the path of success, and I will always appreciate your efforts and care forever... To who I will take as an ideal source in my entire life...My dear father.

Abstract

Although Islamic capital markets are considered an emerging market, the improvement is significantly high which requires permanent study. In this empirical study, we go through the Malaysian index using the daily data of the FTSE Bursa Malaysia composite index (FBMKLCI) and two Shariah indices FTSE Bursa Malaysia (EMAS Shariah and HIJRA Shariah). First we analyse the efficient market hypothesis in the weak form using variance ratio and unit root test. Our results show that both markets (Shariah and conventional) are (in)efficient and the investors are able to gain an abnormal return using historical data. Furthermore, we test the co-integration between the three indices for diversification opportunity. Results shows a new evidence that the market has no co-integration and there is a diversification opportunity on both short and long term. Therefore, prediction of an index based on the other is not possible.

Key words: Islamic Finance, efficiency, diversification, Bursa Malaysia

In the Name of Allah, the Most Gracious, the Most Merciful

"People, We have created you all male and female and have made you nations and tribes so that you would recognize each other. The most honorable among you in the sight of God is the most pious of you. God is All-knowing and All-aware". The Holy Quran

Al-Hujraat Verse No: 13


لا إله إلا الله محمد رسول الله

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1. Introduction

The term Islamic finance is used when the Islamic prospective is used in a financial approach. Even the most known universities began to show some interest in Islamic finance, as the Harvard University in the US where it was held the Eighth Conference in 2008 about Islamic Financing. Other universities in Australia, Europe, Malaysia, Indonesia and others have shown interest. Moreover, attention from banks and global financial institutions regarding the Islamic approach in economy represent the practical development of this promising economy, and are supported by the emergence of global institutions that issued accounting and auditing standards for financial institutions to carry out their activities formats legitimate and justified within the global Islamic capital market. For this, we have to clarify the Islamic economics and distinguish it from other landmarks (Kontakji 2010).

The recent financial crisis has generated additional interest in discovering Islamic finance, according to (Hassan 2011), Islamic finance is well endowed for bringing noteworthy aides for a healthier and more stable international economics, an honest implementation of Islamic finance could mitigate or eliminate such crisis.

The Islamic finance has gone through a rapid growth since its main launch in (1960s). Since then Islamic finance added a lot of important innovation and sophistication, allowing for a variety of products and instruments beyond limited to a kind of conventional market replication that deals with fixed income and derivatives. The Islamic finance is based on real economic trade, by avoiding the traditional fixed interest based and speculation practices, dealing with trade as Investment on the basis of profit-sharing and other means of solidarity for doing

business, and aims to integrate the principles of the Shariah (Islamic law). Principles like social justice, the environment and kindness, in order to have investment products and financial markets which are in cooperation with ethics and sustainability (Hassan & Mahlknecht, 2011).

This market has a potential reach of 1.6 billion Muslims around the globe. Also non-Muslims have the opportunity as well to join this market. According to (Oakley, 2009, p.1) this market has a growth rate of 15 to 20 percent annually, which is considered as a high growth rate in comparison to other financial markets (Ernst and Young, 2013). Moreover, total global financial assets of the Islamic financial industries are accounted for $ 1.8 trillion in 2014, increasing to $ 2 trillion in 2015. Most of the investment were in Sukuk and equity funds (Miglietta & Battisti 2015). As for the equity indices, some of the main index providers started having a Shariah compliant index such as Dow Jones Islamic Market index (DJIM), FTSE Global Islamic Index Series (GIIS) and S&P/TSX 60 Shariah Index (TXSI.TS) and other countries like India, Malaysia, Pakistan, Saudi Arabia, Taiwan, Turkey, Bahrain, and Egypt.

In our research we highlight the Bursa Malaysia Market. We choose Malaysia for our analysis as it has both Islamic and non-Islamic market operating side by side. Moreover, Malaysia has one of the strongest Islamic financial sectors established in the world (Austrade, 2010; Ernst & Young, 2012), and with comparison to middle east, Malaysia has a more sophisticated market and well developed infrastructures, with more liberal Shariah interpretation, making the country a leader in term of Islamic finance (The Banker, 2009). Therefore, we try to test the efficiency for both markets, and check the relation between them and if they have the same tandem on long-short term.

Our sample contains two Shariah indices (FBM EMAS Shariah and FBM HIJRA Shariah) as they both have different screening criterion, and the FBM KLCI the Malaysian main index. Our efficiency tests are done using the Lo and Mackinlay Variance ratio test, Augmented dicky fuller and Phillpe Perron test. Our results reveal that the Bursa Malaysia is inefficient in both Shariah and composite indices, meaning that investors are able to predict future security prices using historical data. Furthermore, we test the diversification opportunity between the three indices on the long term using Johansen and Juselius (1990) and on the short term using a Granger Causality test. Our results show no relation between the three indices on both long and the short term, and that investor will have to make prediction for each market, as they are different markets and there seems to be a diversification opportunity.

The importance of this research is that efficiency is part of the Islamic Finance objective, regarding the price mechanism in the market, as the security prices should reflect the true value of the companies. This part of Islamic finance principle of prohibition of Gharar (lack of transparency), speculation and Riba (usury), that mean in theory Islamic markets should be in the strong form of market efficiency (Ardiansah, M, & Qoyum 2012).

If the stock markets today do not achieve the purposes of the Islam, this does not mean to overlook it, and leave it, or judge on it immediately, given the importance of this stock market, the increasing interest in it, and the size of the potential investors, however, it requires an honest look of its details, in theory and practice, and then analyse it through an accurate perception both sides, and do everything that we can to reach an Islamic alternative that takes into account originality, innovation and development of these markets (Sammour N. 2007).

The rest of this study is divided as follow: In section 2 we do a background of Islamic finance, followed by defining the Islamic rules (Shariah) and the principles of Islamic finance in section 3, then in section 4 we discover in detail the Bursa Malaysia structure and the screening criterion, in section 5 define the Efficient Market Hypothesis (EMH) and the relation between EMH and the Shariah, in section 6 we go through previous tests of EMH in Islamic markets, in section 7 we present our methodology followed by data in section 8, results interpretation and conclusion are in section 9 and 10.

2. Background of Islamic financial market

According to WIEF (2009, p.1) the traditional financial system is around 300 years old and is based on fixed interest rate which covers the financial and economics aspect of the transaction. This financial system is practiced widely all over the world, although Christian religions forbid the use of interest and values the human well-being as a whole. However, the traditional financial system found its way into the Christian society and emerged (Schoon, 2008, p. 10), although it was opposed during the history by the church. According to Ambrose "*If anyone commits usury, he commits robbery and no longer has life*" (Christian History Magazine, 1987, p.1). Despite this, the traditional financial system kept growing regardless of all the negative views, without any substitute, until the mid of 1980's, where the Islamic financial system started to reveal again (Schoon, 2008, p. 10).

Within the last thirty-five years, the term Islamic finance started to rise and grow vastly. Islamic finance denotes to a financial system that is consistent with the Islamic rules (Shariah), which focus mainly on the human well-being, justice and the benefit to the whole mankind (Schoon, 2008, p. 10). The Shariah covers both the economic and non- economic side of the transaction at the same time.

In Islamic finance, interest is severely prohibited and it is strictly forbidden in Shariah (Association of Islamic Banking Institutions, 2010, p.2). Islam provides reasons for this, as it considers the interest based financial system as a slavery for the mankind, in which rich will become richer and poor will become poorer, and eventually the whole financial system collapses. However, Islamic financial system is not just the "interest free" financial system, it has other unique features like risk sharing, asset backed financing and other duties of the individual and society (Zamir & Greuning, 2008, p. 42).

The modern Islamic finance started to emerge during the 1963 by Dr. Ahmed Abdul-Aziz El-Naggar in Mit Ghamr (a name of a city on the Nile Delta) in what is considered the first attempt to introduce the profit loss sharing in banking transactions instead of interest rate (Omar et al., 2013, pp. 18-19; El-Naggar, n.d.). In 1970, during the oil prices crisis, the idea of Islamic finance started to gain attention. Financial institutions started to gain accumulated funds in order to be invested in accordance of Shariah principles (Shanmugam & Zahari, 2009, pp. 46-47). On the other hand, the beginning of Islamic indices was in the late nineties by DMI in 1998 (Dar Al Mal Al Islami) jointly by two private banks (Faisal Finance and Bank Vontobel) and having 150 listed companies globally, followed by SAMI index (Socially Aware Muslim Index). It included 500 Shariah compliant companies (Khamlichi 2014) shortly after. Other index providers started to join the market, such as the Dow Jones Islamic Market index (DJIM) in 1999, FTSE Global Islamic Index Series (GIIS) in 1998 and S&P/TSX 60 Shariah Index (TXSI.TS) in 2009. Other local index providers for Shariah compliant companies started to join the market as well in India, Malaysia, Pakistan, Saudi Arabia, Taiwan, Turkey, Bahrain, and Egypt. According to the Global Islamic Financial Forum (2014), Islamic investment is considered to be the fasted growing segment regarding the global financial market. The market growth rate is around 15% and in the recent years the amount of Islamic assets under management are estimated of USD 2 trillion. Although the Middle East should be the hub of Islamic finance, however, Muslims outside the Middle East represent a large population, in countries like India and Malaysia, or even some developed countries like the United Kingdom, France, Germany, Netherlands and the United states (Smith, 2005, p. 2).

3. Shariah (Islamic law)

3.1. Description

The recent global financial crisis affected in a positive way the perception of Islamic finance, highlighting that adopting its principles by Western institutions could be positive.

Islamic finance refers to a financial market that is consistent with Islamic rules (Shariah) regarding its services and transactions. This market is directed by the ethics of Islam, "The *goal of Islamic finance is to stress risk and reward sharing over exploitation, community well-being over materialism, and the brotherhood of humankind over the fragmentation of society"* (Shanmugam & Zahari 2009).

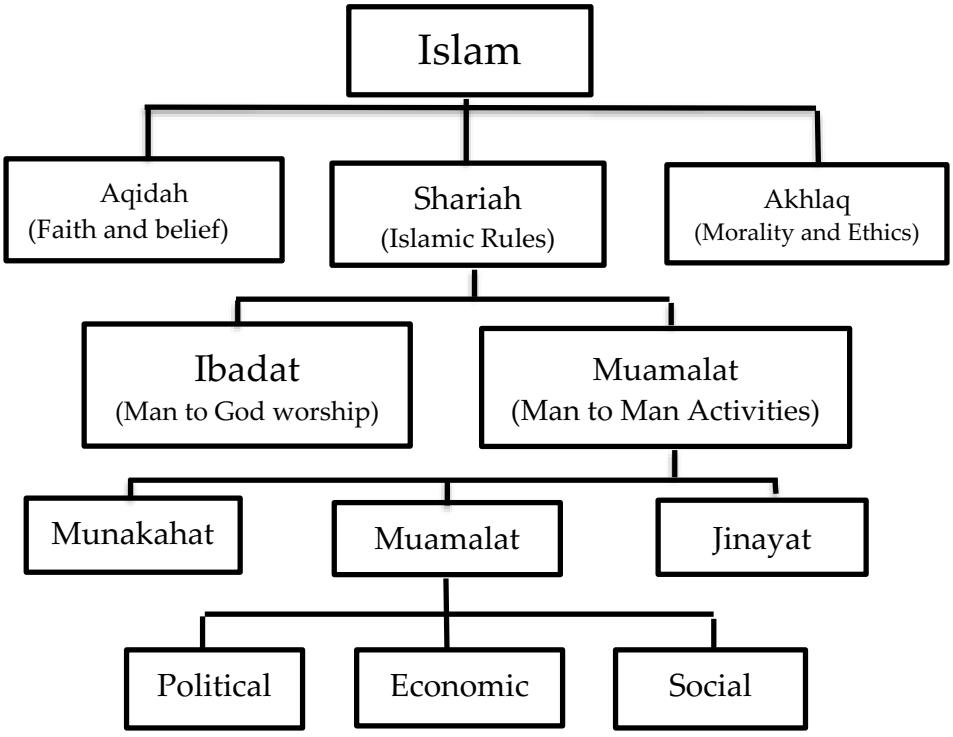
The word Islam is derived in Arabic from the word "salaam" which means submission or peace, a person who have faith in Islam and follow it consciously is a Muslim (Khir, Gupta, and Shanmugam 2007). The whole Islamic concept is based on the Idea that there is only one God (ALLAH) and that the whole universe is created and controlled by him only, and that he created the mankind and choose it to be his successor on earth, for achieving certain objectives, through submitting his commands (Usmani 2004).

The religion of Islam incorporates three basics fundamentals: Aqidah (Creed), Akhlak (Ethics) and Shariah (Islamic Rules) (Table 1).

Aqidah (Creed): excludes any doubts or supposition or suspicion regarding the believer (Al-Qari, no date), it covers all aspects of beliefs and faith of the Muslims such as Belief in Allah, Angels, all Divine Books, all Prophets, the Day of Judgement and in Allah's predestination.

Akhlaq (Islamic Ethics): related to Muslim's personal conduct, includes the rules and prohibitions that covers a Muslim's personal and professional behaviours, attitude, work etc. (Shanmugam & Zahari 2009).

Table 1: Islamic science



Source (Shanmugam & Zahari 2009).

The Shariah (Islamic rules): According to Muslims, prophet Muhammad peace upon him was the last prophet sent by Allah to humanity. Allah says *"And We did not send you (O Muhammad) except as a mercy for all creation" (The Prophets, 107)*. He was given the Holy Quran (the divine book of Islam), and it is considered the main source of the Shariah in Islam as well as the Sunnah (the authentic saying and reported action of the last prophet peace upon him). Table 2 and the next section describe the main and minor sources of the Shariah in details.

The Shariah achieves its goal by preserving or protecting human benefits by setting rules and regulations with sets of prescribed punishments in life and after life.

These rules are not limited to some sets of worship or religious rituals, On the contrary, these rules almost cover every aspect of Muslims daily lives Usmani (2004). The Shariah covers the *Ibadat* (man to God relation) and *Muamalat* (man to man relation), Islamic finance is linked to the Shariah through the *Mumaalat*, which encompass a variety of activities like political, economic and social. Muamalat covers the daily life of Muslim's relation not only with human but with animal, plants and non-living things as well (Shanmugam & Zahari 2009).

According to Ibn Arabi (Vol 5, P 102, 1240 AD), in different times and different circumstances messengers of Allah have been sent, and each one made belief of the ones before him, and never disagreed in the principles that they provided and sent for, even with some differences in verdicts. This is how the Shariah and its verdicts came to us, and the ruling of the Shariah vary by the time and circumstances as *Allah says: "For each (community to which a Messenger was sent with a Book) have We appointed a clear way of life and a comprehensive system (containing the principles of that way and how to follow it) "Al Maidah 48*, this is how they agreed on the principles.

The Shariah objective is the benefit (*Maslahah*) and it can be sizable in any time and place as it is the road to salvation. The Shariah has constant and flexible rules. The constant are principles which have eternal application and are obtained from the main sources (The Holy Quran, Sunnah and Ijma'a). The flexible is what was left unmentioned in order to obtain the rule regarding human activities through

Ijtihad[1], therefore, the flexibility might change in time and place but within the principles of the Shariah, it cannot change, modify, or even replace it (Kontakji 2010).

By this, the Shariah did not put the humanity into a very narrow circle, or leave it all for human perception and desires, it was balanced between them, as it left a wide area of human activities for his personal judgments so he can make decisions from his mind and evaluate it (Usmani 2002).

According to this, the principles of the Shariah is a small size area and it does not have a place for Ijtihad, but it is very important as it has the constant of thoughts and practices of the Islamic nation. An example for the principles of Islamic finance, and are relevant to our study, is the prohibition of Usury and monopoly, and regarding the flexibility, it is a wide area left for Ijtihad and without it the Shariah would be inanimate (Kontakji 2010).

This is all within the Shariah objective of benefit (*Maslahah*). According to Abu Hamid Al-Ghazali (Vol.1. p. 416, 1997) said, *"Welfare (*benefit or Maslahah*) which we mean here is the protection of the objectives of the Shariah. Namely, the objectives of the Sharia are five in creation: the protection of religion, life, intellect, family relations, and property. Everything that advances the protection of these five fundamentals is considered benefit, and everything which fails to protect these five fundamentals is considered corruption."*

[1] Ijtihad: means striving or self-exertion, a concept which allow the Shariah to adopt a situation or an issue that has not been addressed in the Quran or Sunnah (Khir et al 2007), the Ijtihad should be carried out by Shariah scholars at the collective level, but as a precondition, there must be some individual efforts that may serve the basis for the exercise of collective (Iqbal 1997).

So the area of flexibility has given the capacity and flexibility of the Shariah to adapt the facts and the ages of different environments, so it will not narrow the Shariah in any way. Islamic Sharia did not size the innovation circle, but on the contrary, it identified the principles and kept allowance for human effort in innovation (Kontakji 2010), The Messenger of Allah, peace be upon him, said, "*If a judge makes a ruling, striving to apply his reasoning (Ijtihad) and he is correct, then he will have two rewards. If a judge makes a ruling, striving to apply his reasoning and he is mistaken, then he will have one reward*" (Sahih Bukhari No.7352, 854 AD, Sahih Muslim No.1716, 864 AD).

3.2. Sources of the Shariah

The Shariah consist a set of rules for Muslims of how they should live in the world, the main sources of the Shariah are as follows:

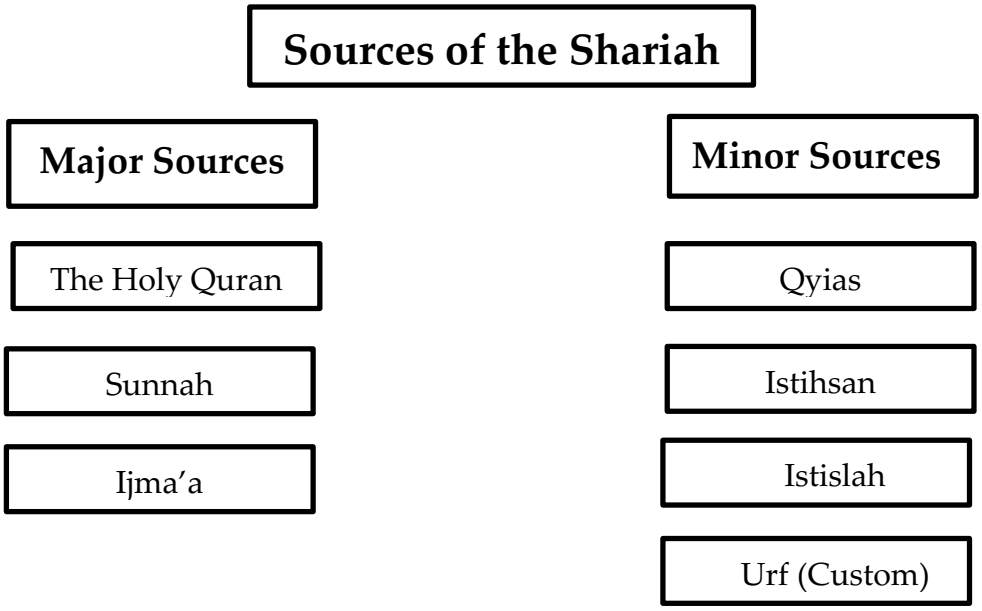
First, the Holy Quran is regarded by the followers of Islam as the immutable and final revelation of Allah. It is considered to be both "*divine and eternal*" because it represents the true words of Allah (Al-Omar and Abdel-Haq 1996). According to Muslims belief, the Quran is the only book of God that has not been distorted, the Quran awakens the humans' higher consciousness of their relationship with Allah and the universe. The Quran serves a guidance for Muslims' success in both the material and spiritual realms of their lives (Shanmugam & Zahari 2009).

Sunnah is the authentic sayings and reported action of the last prophet Muhammad peace upon him (Shanmugam & Zahari 2009).

Ijma'a an Arabic word means "to agree on something" it denotes to the dependable consensus of qualified legal scholars in a certain time period over a

particular religious matter (Shanmugam & Zahari 2009), the Ijma'a is considered sufficient evidence for being a legal action as it is stated in the Sunnah, prophet Muhammad peace upon him said "*My community will never agree in error*" (Enayat 2005, p. 20). Therefore, the agreement between the scholars of Islam on any religious matter is a source of law in Islam (Kamali 2005).

Table 2: Sources of the Shariah



The principles of the Shariah are derived from these sources, moreover, there are other minor sources used with Ijtihad (Table 2).

3.3. Principles of Islamic Finance

The conventional financial system covers the transaction from the economic and financial side, however, the Islamic finance principles covers the transactions from the religious side as well as the ethical, moral and social dimension (Khamlichi 2014), in order to enhance equality and fairness for the good of society as a whole. The system can be fully valued only within the context of Islam's teachings on the work ethic, wealth distribution, social, economic justice, and the role of the state (Iqbal 1997).

The main principles of Islamic finance can be classified in the following points:

- Risk sharing

  Certain profit is not a hundred percent guaranteed, there is always some risk associated with it. Therefore, in the Islamic finance, in order for the investor to make a profit he should bear his share of the associated risk. Any predetermined fixed rate of the profit is forbidden (Standard & Poor's, 2008, p.2).

- Asset Backed Financing

  The Islamic over view towards money is just as a measurement tool, it does not have an intrinsic value, and it does not represent a commodity, it is accounted as a medium of exchange. By this, it is forbidden to make money from money, by giving it as a debt or a bank term deposit. Therefore, money is a potential capital, not a debt, and real assets should be used by the transaction in the Islamic finance (Standard & Poor's, 2008, p.1).

- Social Welfare

  The soul of the Islamic economic system is the social welfare, justice, universal brotherhood/sisterhood and prosperity of the entire society. According to the Shariah, all aspects of the society should be governed and controlled under the Islamic teachings and beliefs and there is no separation between social life and economic or commercial life of the society. All aspects of the society are together and cannot be dealt separately as in the case of traditional financial system in which religion has to do nothing with the financial market operations and the environment. So, in Islamic finance, financing should only be for healthy

activities which are not against the human ethics and that create social welfare and justice in the society (Iqbal, 1997, p. 42).

- Social development (*Zakat*)

  A religious tax system paid by Muslims whose wealth reaches a certain level, Zakat is imposed at 2.5% of total market value of individual's asset, tradable good and financial property, zakat is even imposed on the initial capital of Islamic banks, reserves and profits. Zakat is collected into a fund and distributed by religious institution to poor people, this will help in narrowing the gap between rich and poor people. Zakat is considered one of the five main pillars of Islam. It provides social welfare and development of the community (Shanmugam & Zahari 2009).

Prohibition in Islamic Finance

On the other hand, some activities are prohibited in the Islamic finance. The following are some of these activities:

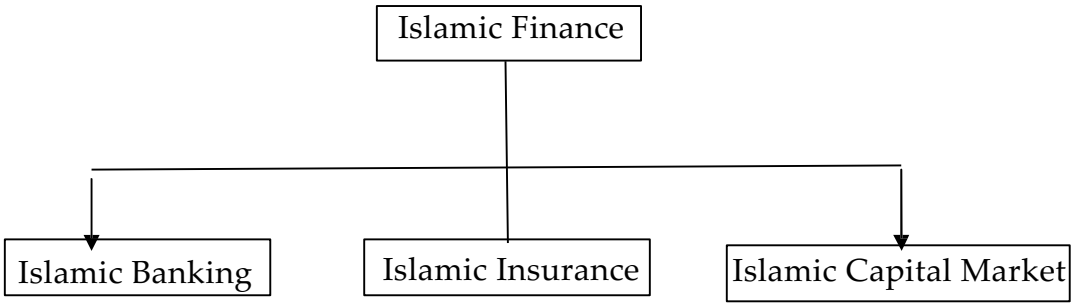
- The prohibition Riba (Usury): interest rate is forbidden in receiving or paying.
- Materiality: transactions have to have Material finality, this has to do with real economic transactions. Islamic finance supports the investors to have their money invested effectively (Miglietta & Battisti 2015). The idea is that it is not allowed to sell what you do not have.
- Justice: a financial transaction should not lead to the exploitation of any parts of the transaction or contract (Miglietta & Battisti 2015).
- Prohibition of speculation behaviour (*Maysir*): Islamic financial system forbids hoarding or any transaction featuring uncertainties, gambling and risks (Iqbal 1997).
- The sanctity of contracts (*Gharar*): Islam advocates contractual

obligations, especially the disclosure of information and transparency, as a sacred obligation, the reason of this feature is to reduce the risk of asymmetric information and ethical threat (Iqbal 1997).

3.4. Categories of Islamic finance

Islamic finance could be mainly divided into the parts presented in Table 3.

Table 3: Categories of Islamic Finance



Source (www.Ifsb.org)

3.4.1.Islamic Banking

The early beginning of Islamic finance was through Islamic banking, which was introduced in the 1970's. Since then, it has grown tremendously. Using the Islamic finance principles and Islamic instruments that differ from the conventional banking in order to be Shariah compliance such as Ijarah, Mudarabah, Musharakah, Murabaha, Bai Bethaman Ajil and Istisna. Moreover, Islamic banking found its way globally through Islamic windows inside conventional banks, such as HSBC and others.

3.4.2.Islamic Insurance (Takaful)

In Islamic finance, the term insurance is changed to Takaful. Principles of insurance are based on mutual cooperation, social solidarity and mutual indemnification regarding issues of losses to any of the group members,

commencing a joint fund. The annual growth of the Takaful market is around 20 percent with comparison of 2.5 percent of growth for the conventional insurance (Haidar and azhar 2010).

3.4.3.Islamic Capital Market Structure

The main component in the Islamic capital markets are the Sukuk market and equity market. The largest capital markets are in the area of Asian Pacific and Gulf area (Haroon, 2008, p.15).

4.3.3.1. Sukuk market

Sukuk is used instead of bonds as a form of a financial note, embody a value of an asset, are issued and traded in accordance to the Shariah, through variety of financial instruments such as Ijarah, Mudarabah, Musharakah, Murabaha, Bai Bethaman Ajil and Istisna. Sukuk are becoming the most preferred choice for companies for fund raising, as it avoids the fixed interest rate. The competitive price and the cost are the main reasons for being preferred by investors (Security Commission 2007a).

4.3.3.2. Islamic Equity Market

The Islamic equity market includes the following products:

1) *Shariah-compliant stocks:*

ordinary shares issued by companies that is considered as Shariah compliant in the primary market and then traded in the secondary market.

2) *Islamic index:*

Similar to conventional index, this Islamic index is a Shariah stock benchmark includes thousands of broad market indices that have passed the

requested screening criterion, the methodology of the screening is a set of rules and financial ratios, the indices should pass these rules to be considered as Shariah compliant, the screening methodology might vary from an index to another depends on the scholars Ijtihad. The Islamic index provide information for the investors about the Shariah compliant companies, this reduce the research cost for the investors and help them in constructing their Islamic investment portfolio Kontakji (2010).

3) Islamic unit trusts:

Similar to conventional unit trust, an Islamic unit trust collects fund from investors and then invest it in stock, Sukuk or any other investment product, however, these investments should be Shariah compliant.

These mutual funds are managed using Mudaraba method, it is based on a partnership between an investor who gives money for another person to invest it in commercial activities. The owner of the money is called (Rabul Al Mal) while the fund manager is called (Mudarib) Usmani (2004). The main criteria of this instrument:

a) The owner of the fund is considered as a silent partner.
b) The Manager (Mudarib) takes a percentage of profit or predetermined fee plus a percentage of profit. In case of loss, the owner of the money will incur it.

These investment fund have a variety of modes of investment:

- *Equity Fund:*

In this mode, the amount of fund will be invested in common stock of Shariah compliant companies, the profit will be derived either from reselling the stocks in a higher price or through dividend. the main activities of these companies Should be permissible in the Shariah, in case of interest bearing

activities it should be less than 5%, and the company should pass some financial ratio test. These companies will be discussed in our study with further more details in the screening criterion for the Shariah compliant company.

- *Ijara Fund:*

Ijara means to give something on rent', the term is used for two different situations, the first is employ a person for getting his service and pay a wage on return for his service, the second which is the one used in mutual fund, is owning a property and give the benefit of using it to another person in exchange for rent, this term matched the word leasing in English Usmani (2004). The owner incurs the maintenance expenses of the property and the profit is distributed to the investors of the mutual fund. These investors receive a partner certificate as a Sukuk, and it can be traded in the secondary market.

- *Murabaha Fund:*

A popular method in banks and financial institution for sales, the method is based on cost- plus financing, the Murabaha idea is to purchase a commodity that is desired by a client and sell it back to on a deferred payment with an agreed margin of profit over the cost Usmani (2004). critical argument has been made on this type of financing as it is similar to the conventional loan (Shanmugam & Zahari 2009). However, according to the Shariah, this type of finance should be a close-end fund, and it cannot be sold in the secondary market, and in case of exchanging for money, this should be done on par value Usmani (2004).

- *Commodity fund:*

Buying commodity for resale, the profit will be distributed among investors, the Shariah govern this method with the following rules Usmani (2004):

a) Owning the commodity before resale, shot selling is forbidden. Physical possession over the commodity is essential.
b) Forward sales are forbidden except for Salam and Istisna'a[2]
c) Commodity should be considered as Halal (permissible) in accordance with the Shariah.
d) Price is fixed and know for all parties, any uncertainty the sale will be considered invalid.

- *Mixed fund*

A combination of the above Islamic finance instruments, and it is tradable in the market, if the tangible assets are above 51%. Otherwise it will be considered as a closed-end Fund Usmani (2004).

In 2015, there were more than 1030 Islamic fund with an estimated value of USD 60 billion registering an annual growth rate of 5.05% Mifc (2015). Furthermore, according to Thomson Reuters (2015), this market is expected to reach USD 77 billion by 2019. Malaysia & Saudi Arabia hold 69% of total Islamic funds under management.

[2] Salam and Istisna'a are Islamic instrument which is used mainly in Islamic banking, for more details:

Usmani, T (2004). An Introduction to Islamic Finance, Arham Shams

4. Malaysia overview

The Malaysian Islamic market experience worthy of study and brings lessons that could be followed by emerging countries in order to promote their Islamic financial market. During the last twenty years' things have changed in Malaysia from a country that relies mainly on the export of some agricultural raw materials to an exporter of industrial goods, in the areas of electrical equipment, machinery and electronics. Malaysia showed a distinct experience in facing of the famous Southeast Asian crisis which the country witnessed in year 1997, addressing the crisis through a national agenda, by which severe restrictions were imposed on monetary policy, by giving the central bank sweeping powers. Malaysia emerged strong from the financial distress in just two years. Moreover, the increased religious awareness by the public opened the door for the Islamic Market. This market has become a parallel market to the conventional one, and complementary to the Islamic banking system in broadening and deepening the Islamic financial transactions handled in realising Both Islamic and conventional markets are subject to the same regulatory body, the Security commission (SC). The market offers a Shariah compliant market, with the opportunity for Muslims and non-Muslim to participate (Sammour N. 2007).

According to Mcgowan and Muhammad (2010), 60 percent of the Malaysian investors are Muslims. This reflects the high growth potential of the Islamic market. Moreover, a proper Shariah screening criterion is important not only for defining the Shariah compliant (Halal) company, but also to reflect the good image of the company, which is a part of the Shariah principles. Beside the physical context of the image such as quality, environment friendliness, safety and the advisor company for the IPO of the stock, a good screening criterion could help the investor to avoid a non Shariah compliant investment (Ho et al., 2012), and improve the market efficiency.

4.1. The Kuala Lumpur composite Index (KLCI)

The early beginning of Malaysia for entering the security business was with the Singapore stockbrokers' association, established in 1930, which was registered later in 1937 as the Malayan Stockbroker's' association. Later, in 1960, the Malayan stock exchange was established then emerged with the session of Singapore in 1965. However, the real beginning for public trading of securities in Malaysia was in 1973. After the separation of both markets, Kuala Lumpur stock exchange Berhad was established instead (Bursa Malaysia's About Us Page – Data updated as at 3 February 2016). On April 2004 the name changed to Bursa Malaysia Berhad, "on 26th of June 2006 and by the collaboration of the global FTSE Group and Bursa Malaysia Berhad, they launched a new index series and introduced the FTSE Bursa Malaysia index, all listed companies are listed either on the main market or the ACE market *(access, certainty and efficiency)*. The criterion for both markets differs in the company's profit track record and the paid up capital (Abdullah, R., et al 2011).

4.2. Shariah Index

The Shariah index is a weighted average index for securities that have been selected from the main board and approved by the Shariah Advisory Council (SAC).

Malaysia is considered as one of the most active countries in terms of Islamic finance. The security commission of Malaysia (SC) has formed the Shariah Advisory Council (SAC) which formulated the Shariah screening methodology for assisting the investors in defining the Sharia Compliant securities (Zainudin et al 2014).

The Shariah Advisory Council (SAC) is considered the highest Shariah authority regarding Islamic finance in Malaysia, was established in May 1997,

and is supervised and regulated by Bank Negara Malaysia. It is responsible for providing a list for all Shariah compliant securities on semi-annual basis, and give notice for non-Shariah compliance to fix their status within a month. The SAC review is based on information from financial reports, surveys, and enquiries of company's management (Securities Commission Malaysia, 2011).

4.2.1 History of the Shariah Index (KLSI)

The beginning of the Shariah index in Malaysia was on 1999. The KLSI was established to meet the increase in demand of the investor to deal with securities that meet the Shariah principle. Therefore, KLSI was established as a benchmark for securities which are in line with the Shariah, comprising 279 companies at the initial launch of the index. By 2005 it had grown to 826 company, 84 percent of the total listed company in the composite index (KLCI).

By the 22nd of January 2007, and with the collaboration of the global FTSE Group and Bursa Malaysia Berhad, they launched the FTSE Bursa Malaysia EMAS Shariah (FBM EMAS Shariah). This new index worked in parallel with the KLSI for nine months before KLSI was deactivated. FBM EMAS Shariah became the index for the Shariah investment, and its scheme was in line with the international FTSE recognized index methodology. By taking the component of the FTSE Bursa Malaysia EMAS Index, this index is a free float weighted, liquidity screened index and with respect of the securities Commission's (SC) and the Shariah Advisory Council's (SAC) for screening Methodology for Shariah compliant security.

According to (Security Commission), by the end of November 2014, 673 Shariah compliant companies were listed, this makes it 74 percent of total 905 companies listed in Bursa Malaysia. This also reflects the high growth rate for the Shariah market. Shortly after, the FBM HIJRA Shariah launched on the 21st of May 2007.

4.2.2 Screening criterion for Shariah compliant company

In term of stocks screening, all of the Islamic stock indices follow a common stock selection process, with respect to prohibitions and rules of the Shariah. However, different indices might have some differences regarding the screening overview. The Shariah scholar worked in parallel with the regulators and developed qualitative and quantitative screening approaches for defining the stock compliancy regarding the principles of the Shariah. Two steps of filtering have been provided by the independent Shariah board for the screening process, the activity sector of the firm and the financial ratio (Khamlichi 2014):

The first set of the screening process depends on the company's business. This process manages to classify the companies by their activities, in order to exclude companies that operates in a specific area that is considered non Shariah compliant, like conventional financial institutions, insurance companies, casino, pork products, alcohol, and tobacco (Derigs & Marzban, 2009). The disagreement between the Shariah scholars arises when a company's main activity is permitted with the Shariah, however it incurred some prohibited transaction (Yaquby, 2000; El- Gamal, 2006). Therefore, the scholars developed a second set.

The second set of the screening process is the quantitative part. Using some financial ratios, this process has been developed for the mixed activities in a company that has a small amount of interest or unlawful income, especially if some Islamic institution requested for allowance in their portfolio El Gamal, (2006).

When profits are made through dividend, a percentage of this dividend should be paid out by the investor to charity, this percentage is correspondent to the proportion on interest earned by the company or the average interest earned by the companies included in the portfolio, this process is termed a s Purification,

Allah says: "*Take alms out of their property, you would cleanse them and purify them thereby, and pray for them; surely your prayer is a relief to them; and Allah is Hearing, Knowing" Al Taubah* 103.

The purification could be done on capital gain (i.e. purchase low price shares and sell them on higher price), this is true according to some Islamic school of thought, to be free from doubts.

Purification is different from Zakat, it is only applied in mixture activities in the second set of screening criterion, on the other hand Zakat is an obligation.

This authorized allowance is not the same for all Shariah –boards. As a result, different screening methodology has been adopted by the indices (Derigs & Marzban, 2009). The action of accepting this allowance is still an argument between the scholars, and the amount of the allowance as well. Scholars who refuse the allowance argue that interest is prohibited regardless of its volume, and that the prohibited transactions are spread over the company's operations and cannot be segregated from permissible transactions.

Shariah screening criterion changes over time and from one place to another, dependent on the Ijtihad of different scholars or even within the changing of opening of the scholar himself (Mahfooz & Ahmed, 2014). According to Catherine S.F et al (2014) these differences can be seen as an active sign of flexibility with the provisions of Islamic Shariah, as it aims to help Muslims in the emerging issues and circumstances relating to the Shariah interpretation. Various Islamic schools of thought and opinions of the Shariah board exist. As Allah says *"Allah intends for you ease and does not intend for you hardship" (Al Bakaraa 185).* And it is worth mentioning that the AAOIFI for Shariah compliant standard are aiming toward harmonization of the different Islamic finance practices across the major markets, in order to facilitate the further expansion regarding this industry (AAOIFI, 2010).

The benefit of this screening criterion was helpful for detecting signs of some corporate trouble, such as WorldCom and Enron. The Dow jones Islamic Market removed WorldCom from its listing companies as it could not pass the DJIM screening requirement regarding the debt to market ratio assessment, as it should be less than 33%. As a result, the Islamic fund managers started to sell the WorldCom shares 6 months before it lost its value (Hussein 2004).

4.3. Details of the Indices

4.3.1. The FTSE Bursa Malaysia KLCI

The KLCI represents the performance of the largest 30 companies by full market capitalization that are listed in the FTSE Bursa Malaysia EMAS Index. The listed companies should pass the free float, size, and liquidity screen tests. By September 2015, the index represented 60 percent of the main market in Bursa Malaysia. (Security commission 2015).

4.3.2. The FTSE Bursa Malaysia EMAS Shariah index

By the end of 2014 the FBM Bursa Malaysia EMAS Shariah Index included 203 companies, these companies should be consistent with the Shariah Security Commission's SAC screening methodology, and the core of the company should not be in any of the activities presented in appendix 1 (Security commission 2014).

Shariah Security screening methodology was framed by the Shariah Advisory Council (SAC) of Securities Commission (SC) of Malaysia in order to advise the investors classifying Shariah compliant securities, that meets the Shariah principles by avoiding Riba (usury), Maysir (gambling), speculation and Gharar (uncertainty). The first methodology was set in 1990 which has a qualitative and

quantitative assessment, the quantitative part used to classify the securities to Sharia or Non-Shariah compliant company. For the mixed activity it has a four activity based benchmark, however, the methodology was revised on 18 June 2012 (Appendix 2), in order to meet the standard for global expectation by modifying the quantitative part, this is by introducing two tier, business activity and a new financial ratio benchmark, as for the qualitative approach remains the same (Zainudin et al 2014).

4.3.3. The FTSE Bursa Malaysia HIJRA Shariah Index

The FBM Bursa Malaysia HIJRA Shariah Index includes the largest 30 companies that are listed in FTSE Bursa Malaysia EMAS Index, which are consistent with leading global Shariah consultancy (Yasaar Ltd) and the Shariah Security commission's SAC screening methodology (Security commission 2014).

This index has been intended to be used as a source for investors regarding Shariah compliant investment products that meet the screening methodology for international Islamic investor (Appendix 3).

The listed companies should pass the requirement set of test in order to be a Shariah compliance, starting with business sector activity and some financial ratios (Security commission 2014).

5. Efficient Market Hypothesis (EMH)

There is a large theoretical and empirical literature concerning the Efficient Market hypothesis (EMH) which analyse the vital implications for financial markets Malkiel (2003). The significant beginning of EMH was the influence of Samuelson (1965) and Fama (1970).

According to Fama (1970) security prices in efficient capital market should reflect all available information regarding that market, which reflects all investors opinion. Therefore, the prices of this market should reveal the true value of the securities. Furthermore, the prices will only change when new information arrives, and per definition, new information is unpredictable. Hence, price changes are unpredictable – the random walk market hypothesis.

In fact, the market is said to be efficient when the price of a security in a specific date mirrors all the available information concerning this security till this date, and any new information whether it was good or bad news, affects the price of this security immediately, in a positive or negative way, the immediate change for the prices regarding the new information means three important things:

1_ that in light of market efficiency, the approaching of the market value of the security of its real value, according to the information available on that security. This means that the market value of the security at a certain date is a function of the information available to them in the market Malkiel (2003).

2_ that the information that reached the market in the past has no effect in the current price of the securities Malkiel (2003).

3_ that the information reaches the investors all at one time, according to this, their ability to gain abnormal return using trading strategies is zero. The EMH says that the market prices are at fair level Malkiel (2003). So it does not make sense to buy and sell securities frequently, incurring high transaction costs.

However, the market still poses firm specific risk that can be eliminated by diversification Fama (1991).

Another important implication of the EMH is the efficient allocation of resources. One of the main characteristics of a stock market is to efficiently allocate resources by transforming savings into investments. If markets are efficient, then the stock market will allocate savings to the most efficient investments. However, if markets are inefficient, and prices do not reflect all information in the market, the efficiency of this resource allocation mechanism becomes doubtful. A number of methods have been employed to test the EMH in financial markets.

Fama (1970) defined three forms regarding the efficiency of the market: weak form, semi-strong form, and strong form efficiency.

Weak form efficiency hypothesis: stock prices will reflect all past information regarding a stock, and no investor will be able to gain abnormal returns using past information (Dhareshwar & Bacon, 2008)

Semi-strong form efficiency hypothesis: stock prices will reflect all available information immediately (public and historical information), therefore, the investor will not be able to gain abnormal returns using public available information as well as historical one, mainly accounting statements, annual reports, dividends, issues of new stock and earnings announcements (Fama, Fisher, Jensen, & Roll, 1969).

Strong form efficiency hypothesis: stock prices reflect all information such as public and private. Therefore, it is impossible to gain abnormal return using internal information, fundamental or technical analysis (Elton, Gruber & Brown, 2007).

On the other hand, the alternative hypothesis is that the market is inefficient. Therefore, the market will not reflect the new information accurately. This might be due investors being incapable of reaching or interpreting the new information,

an obstacle for free trading, or restrictions on short selling (Ardiansyah, M., & Qoyum, A. 2012).

5.1. Market Efficiency and Islamic Shariah

Speculation creates rushes of systemic risk, and can have a strong negative impact on the economy. The Wall Street collapse of the 1920s, and to a lesser extent the stock market crash in 1987, are examples of the threat posed by the stock markets. In addition to this, stock markets have many dishonest activities such as insider trading, which could have a negative effect on moral and business ethics (Naughton 2000).

The relation between Islamic ethics and the efficient market hypothesis is in the same direction. The application of Islamic ethics in general would lead to improve the efficiency of the market. Islamic ethics and principles like freedom of Riba (interest), Ghrar, Ihtikar (Monopoly) etc. All of which can clearly identified with the concepts of efficiency Obaidullah (2001). Moreover, the prices of a security should reflect the real value of the company (Ardiansyah & Qoyum 2012), a concept of market efficiency relevant to the Islamic perspective. It is likely that a broader concept of efficiency may be appropriate (Naughton & Naughton 2000), moreover, Obaidullah (2001) support this, as the efficiency is considered within the Islamic Shariah. Transparency of information and anticipation of extreme volatility and speculation is an example. Particularly, efficiency is in the objective of the Shariah for protecting the individual benefit (*Maslahah*), therefore, efficiency is addressed within the Islamic Shariah in the frame work of Individual benefit (*Maslahah*) and unrestricted public interest.

Some of the main ethics in the financial market according to Shefrin and Statman (1992), with comparison to Islamic finance ethics Obaidullah (2001):

Table 4: Stock market ethics

Norms of Ethics in Mainstream Finance	**Norms of Ethics in Islamic Finance**
Liberty from Coercion	Liberty to Contract
Liberty from Misrepresentation	Liberty from Al Riba
Right to Equal Information	Liberty from Al Gharar (Excessive Uncertainty)
Right to Equal Information Processing Power	Liberty from Al-Qimar (gambling) and Al-Maysir (Unearned Income)
Liberty from Impulse	Liberty from Price Control and Manipulation
Right to Trade at Efficient Prices	Entitlement to Transact at Fair Prices
Right to Equal Bargaining Power	Entitlement to Equal, Adequate and Accurate Information
	Freedom from Darar (Detriment)
	Maslahah Mursalah (Unrestricted Public Interest)

6. Testing the Efficient Market Hypothesis in the Islamic Markets

The efficient market hypothesis (EMH) is one of the main concepts in financial literature. The main idea of the EMH is that asset prices include all of the information reasonably and immediately. The recent financial crisis led to confusion about this hypothesis, revealing useful observations regarding the response of the investors, as well as the instruments for the information to be covered in the price of the stock and the concept of market in-efficiency recently started to reveal. Regardless of the simplicity of the hypothesis, EMH is unexpectedly difficult to be tested. Empirical tests must be followed with lots of attention and extensive care. EMH has gained the consideration of lots of studies, especially in emerging markets, in order to define the level of efficiency. Verity of results has been gained throughout these tests, this is mainly if the test shows no results of EMH and limitation of mathematics and statistics regarding the EMH. Testing the emerging markets requires consideration of excess volatility, mean reversion, non-linearity and chaos in stock market, financial liberalization, as well as the institutional legislation regarding the market Oprean (2012).

In this section, we try to propose the main studies with different methods regarding the efficiency of different Islamic markets.

It is very important to find out if the EMH is supported by the Islamic market, as the Islamic market has proved itself as a good substitute for the conventional market (Arouri et al., 2013; Jawadi et al., 2015). This is due to the fact that the Islamic market is consistent with the Shariah law, which focus on safe investment climate, which results in a moderate risk and promotes the principles of social justice (Jawadi et al., 2015). If the EMH existed in Islamic markets, this means that both markets are segmented and that the Islamic market is able to substitute the conventional one. However, if it fails, this means that both markets are able to

operate together side by side and the Islamic market could offer a benchmark for the conventional one (Causse, 2012; Jawadi et al., 2015).

Most of the existing studies regarding the Islamic finance focused on the Islamic banking sector, with altered opinion and results (Beck et al., 2013; Rosman et al., 2014). However, according to the available tests, we divided the literature review into three categories, focusing on Islamic markets in different countries.

The first category is the performance of the Islamic financial market compared to the conventional financial market. Jawadi (2014) reveal a better performance for the Islamic market, as well as Arouri et al (2013). The authors tested different indices from MSCI and FTSE globally for both the Islamic and their counterpart. Their findings are that the current crisis impact on Islamic indices was lower than in conventional markets. The Islamic seems to have a high return against their conventional counterparties. Furthermore, the US crisis has led to a significant change in investment choices and the portfolios with Islamic products could reduce the systematic risk and provide diversification opportunities.

The second category is by the diversification of the market. By testing the co-integration for the Islamic Dow Jones indices, Guyot (2011), as well as Kok et al. (2009) show the absence of diversification as they are co-integrated with the conventional market. Furthermore, as for the FTSE Islamic family, Girard and Hassan (2008) find that this market is co-integrated with the conventional one, unlike Kok et al. (2009) and El Khamlichi (2014) who show no co-integration and that diversification opportunities exist between some Islamic and conventional markets.

The third category is testing the efficiency of the market. Obaidullah (2001) was the only one to examine the degree of efficiency of the Dow Jones Islamic Market Indexes, and offers contrasting results: The Islamic index reveals a high level of efficiency but also increased volatility. Moreover, Guyot (2011) found that the global Islamic Dow Jones has higher informational efficiency than their counterparties. According to El Khamlichi et al (2014), testing the random walk hypothesis for the daily prices in four global Islamic index, results reveal the same level of inefficiency.

Jawadi et al (2015) have tested the emerging, developed and global Dow Jones Islamic indices using variety of parametric and non-parametric methods. Both short and long term horizon results show that the emerging Islamic stock market is less efficient than the developed one in both short and long term, and that the developed and global Islamic market shows some inefficiency in the short run. Furthermore, using integration relation reveals a long term relation in both Islamic and conventional markets with greater efficiency. Testing the ECM-GARCH for the short term, Islamic markets contribute to the conventional market, implying the Islamic finance ideas could help to decrease the financial risk of the conventional market. Islamic finance could help to shape and improve the conventional market rather than replace it.

As for the gulf area, Fouad Jamaani and Eduardo Roca (2013) tested the efficiency of the gulf area market using parametric, non-parametric, unit root test and Johansen co-integration tests to daily index prices. Their findings show that the market is neither individually nor collectively consistent with the weak form of the EMH.

Regarding the efficiency of the Malaysian composite index (KLCI) Gupta (2011) has tested the efficiency for some of the Asian market (Indonesia,

Malaysia, the Philippines and Vietnam) from January 2000 through April 2011, using Augmented dicky fuller (ADF) test, variance ratio and multi variance ratio, run test and wright test. Results reject the EMH weak form for all the markets.

Hamid et al (2010) have tested some of the Asian pacific market including Malaysian market (KLCI) starting from January 2004 til December 2009 using monthly returns, using Autocorrelation test, Ljung-Box q-statistic test, run test, unit root test and variance ratio test. Results revealed that none of the markets are following a random walk.

Munir and Mansur (2012) have tested the nonlinearity of the Malaysian stock market (KLCI) using data from 1980 till 2008, by using two regime threshold autoregressive (TAR) model and auto regressive unite root developed by Caner and Hansen (2001). Their findings show that the KLCI has a unit root and is consistent with the weak form of EMH, therefore the market is a nonlinear series.

Albaity and Ahmad (2009) tested the performance of the Malaysian market. Both the composite index (KLCI) and the Shariah index (KLSI) results revealed that there is no noteworthy difference in risk return for the period of 1999 til 2005. Furthermore, they have tested the short-long relationship for both indices using the causality test and Johanson co-integration. Results revealed the existence of short –long term relationship between both indices. Therefore, result show there is no diversification opportunity between them and the movement of one indices gives a signal of the movement of the other.

El Khamlichi (2014) tested four global Shariah compliant indices and their counterpart (Dow Jones- FTSE- S&P500- MSCI) for their weak form of market efficiency using variance ratio by Lo and Mackinlay (1988) test and a

diversification test by using the Engle and Granger (1987) approach to examine the co-integration among the Islamic equity indices, with a view to check the long-run theoretical relationship. Results revealed that both Islamic and conventional market have the same level of inefficiency. The results show that Islamic indices have the same level of (in) efficiency as conventional ones, and the indices of MSCI and FTSE families are the less inefficient. However, in terms of co-integration analysis, Islamic indices of Dow Jones and S&P show no co-integration.

7. Our Methodology

Following El Khamlichi (2014), which focuses on the global indexes, we expand the analysis into a deep look for sub-indices for the FTSE Malaysian market. The main market is the FTSE Bursa Malaysia composite index (KLCI), and the two Islamic indices (FTSE EMAS Shariah index, and the FTSE HIJRA Index).

The study will focus on testing EMH these indices using the variance ratio test by Lo and Mackinlay (1988) for testing the weak form market efficiency. Testing the weak form of EMH is based on identifying the market prices behaviour as a Random walk, which states the market evolves in a random walk. Therefore, the market will not show any trend or pattern for the prices, and predicting the future prices using historic prices will not be possible Fama (1965), as well as Malkiel (2003), outlined the relationship between random walk and the efficient market hypothesis, arguing that if prices follow random walk, all subsequent price changes are random departures from previous prices. In this case, stock prices reflect all historical information. Therefore, no correlation should be in the price movement and the investor is not able to gain profit using the historical prices. We will support the results with a unit root test of Augmented Dickey–Fuller (1979) and Phillips–Perron (1988) tests and we use these tests to rank the order of the data. Then we use the diversification test to find out whether these markets are co-integrated by using Co-integration test: Julius – Johanson co-integration for long run and Engle and Granger (1987) approach for the short run. The existence of co-integration between these indices means there is a long-short relationship between these markets and thus less diversification opportunities. Moreover, this means that each index contains information for prediction for the other index. These results will help the investors to diversify their portfolio, as

the possibility to gain an abnormal return in the long run is limited within co-integrated indices.

Diversification occurs when asset classes exhibit different price patterns. The lower the degree of co-integration among asset price series, the greater the possibility for diversification. However, co-integration of the price series could change over time, so diversification benefits could fluctuate. Therefore, we analyse both the long-term and short-term dynamics of Islamic indexes compared to their conventional ones. (Guyot 2011).

7.1. Efficiency Tests

For investigating the efficiency of the market, we start with Lo and Mackinlay variance ratio test, which tests the random walk hypothesis of the market. This method has become very widely used for testing the random walk hypothesis as an econometric tool instead of many other models (Hoque et al., 2007), due to the ability of the Variance ratio for testing the behaviour of the prices even if the returns are not normally distributed (Smith & Ryoo, 2003).

Variance ratio is a test for comparing the variance of the daily return with the variance of the data with k frequency, simply to fulfil the following formula:

$$VR(k) = \frac{VAR\ [Xt\ (k)]}{k\ VAR\ [Xt]}$$

Under the null hypothesis both values should be equal and the value of $VR(k)$=1

H_1: $VR\ (k) = 1$ market is efficient

The more efficient the market, the closer to 1 the ratio of variances becomes.

7.2. Diversification, long and short run relation

7.2.1. Unit root

As a preliminary step, we perform the augmented Dickey–Fuller (1979) and Phillips–Perron (1988) tests to determine the order of series integration.

- ***Augmented Dickey Fuller test***

Augmented Dickey-Fuller (ADF) test is useful to check the existence of unit root in the time series of stock price changes in the indices. Majorly it is used to test the stationarity of the time series. It is resolved from the OLS as follows:

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \cdots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t,$$

y_t =is the price at time *t*,

y_{t-1} = change in price

For defining the formula, α is a constant, and the coefficient is β, and the lag order of the (AR) autoregressive is δ.

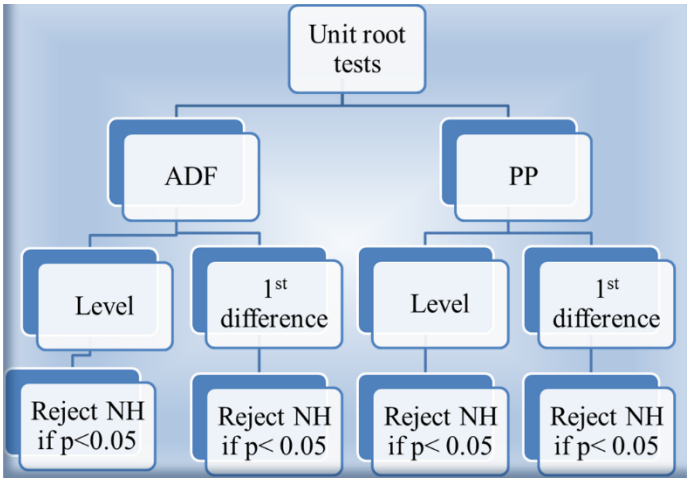
- ***Philip Perron***

The distribution theory supporting the Dickey-Fuller tests is based on the assumption that the error terms are statistically independent and have a constant variance. So, when using the ADF methodology we have to make sure that the error terms are uncorrelated and that they really have a constant variance. Phillips and Perron (1988) developed a generalization of the ADF test procedure that allows for fairly mild assumptions concerning the distribution of errors. The test regression for the Phillips-Perron (PP) test is the AR (l) process:

$$\Delta Y_{t-1} = a_0 + \gamma Y_{t-1} + \epsilon_t$$

While the ADF test modifies for advanced order serial correlation by adding lagged differenced terms on the right-hand side, the Philip Perron test makes a correction to the t statistic of the coefficient y from the AR(1) regression to account for the serial correlation in e_t. So, the PP statistics are just modifications of the ADF t statistics that take into account the less restrictive nature of the error process (Stephen G. Hal p346).

The hypothesis regarding the unit root will be as follow:



If a time series is stationary, then the mean and variance remains the same no matter at what point we measure them.

7.2.2. Long term co-integration

In order to check the existence of co-integration, we need to perform a unit root test, to find out whether the indices are stationary or non- stationary. This could be done by both test The Augmented Dickey Fuller test (ADF) and the Philip Perron. If the variables are co-integrated in the same degree, then this might result in a co-integration. The test will be done by using Johansen and Juselius (1990) and the null hypothesis of the test will be:

H2: There is no long-term relationship between the indices.

The existence of a co-integration relationship between two variables suggests that there is at least one causal effect that is running from one variable to the

other. This co-integration among the variables will require the Granger causality to be applied in the Vector Error Correction Model (VECM), otherwise, the bivariate Vector Autoregressive (VAR) model is employed to test causality.

The first introduction of the co-integration theory was by Granger (1986) and Engel and Granger (1987), then it was generalized for a multivariate system by Johanson (1988). It offers the outlines for examining the long term relationship between time series. Johansen's technique figures co-integrated variables straight on maximum likelihood estimation tests, this is for defining the number of co-integrating vectors. Multivariate simplification of the Dickey-Fuller test. Two different likelihood ratio tests namely the Trace test and the Maximum Eigen value test.

We investigate co-integration using stock index price on data levels for all of the indexes during each period. We conduct Johansen co-integration tests to determine long term relationships between the markets. Considering a VAR of order p:

$$y_t = A_1 y_{t-1} + \ldots + A_p y_{t-p} + \theta + \varepsilon_t$$

Where y_t is a k vector of non-stationary, I (1) variables; $\theta$is a deterministic term; and A_p are (n x n) matrices. The previous Equation could be rewritten as:

$$\Delta y_t = \Pi_p y_{t-p} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + \varepsilon_t$$

Where $\prod p$ is the impact matrix and associated changes in its price Δy_t, to prices, y_{t-p}, P periods earlier Hassan and Girard (2011). Johansen's method is used to estimate the matrix p with a reduced rank r and then it tests if the restriction implied by the reduced rank of p can be rejected. Lags, trend specifications and cases are examined using the Akaike Info Criterion (AIC). Likelihood ratio is used as a trace statistic to determine whether co-integration

(reduction to r of p) between the two non-stationary variables is significant and how many co-integration equations are significant. Significance is set by the critical values reported in Osterwald-Lenum (1992).

7.2.3. Short term co-integration

In order to check whether the market could be beneficial to conventional finance, we carried out a Granger Causality test. The latter stipulates that X causes Y if the forecasts of Y that used previous information for X and Y supplant the forecasts of Y based only on the past of Y. We applied this test to check linkages between Islamic and conventional stock and also to investigate linkages between Islamic stock markets (Jawadi, 2015).

In order to find out, data should be stationary on first difference. This could be done by the ADF and PP tests. The results show the data are non-stationary on level and stationary on first deference, then we run VAR (vector autoregressive test), then the Granger test, test hypothesis would be:

H3: lagged X does not cause Y

Decision is based on the value of p. If it is higher than 5% we accept the null hypothesis, if p is smaller than 5% we reject the null hypothesis.

Our lag selection is (4) based on Akaike Info Criterion (AIC) using Stata program.

8. Data

We used Thomson Reuters Datastream to obtain the time series of the daily closing price for the FTSE Bursa Malaysia composite index, the EMAS Shariah index, and the HIJRA Shariah Index. Daily data is used starting from the first of June 2007, the time that Bursa Malaysia joined the FTSE, until the end of December 2014. The total number of observation is 1867. The reason of using daily data is that the Asian markets are characterized by a certain degree of predictability when using high frequency data (Guidi and Gupta 2013).

The daily closing prices and the return was calculated as follows:

$$R_t = Ln\ (P_t) - Ln\ (P_{t-1})$$

9. Results and interpretation

In this section we present the graphical analysis followed by our methodology results starting by the efficiency test, unit root and long-short co-integration.

9.1. Graphic analysis and Description

In figure 1 to figure 3 below we can observe the graphical daily return for the FBM EMAS Shariah, FBM HIJRA and FBM KLCI. By going through the observations, we can see the strong parallelism between the indices.

In Table 5 below we present the main descriptive statistics for the three indices.

Table 5: Preliminary analysis

Variable	*Observation*	*Mean return*	*Std. Dev.*	*Min*	*Max*
LN(KLCI)	*1867*	*7.26781*	*0.20341*	*6.72071*	*7.545733*
LN(EMAS Shariah)	*1867*	*9.19698*	*0.20958*	*8.63064*	*9.511568*
LN(HIJRA)	*1867*	*9.27522*	*0.20875*	*8.73224*	*9.623269*

The mean return for both Shariah indices were higher than the KLCI, this is consistent with the standard deviation, as both Shariah indices appear to observe more risk than KLCI.

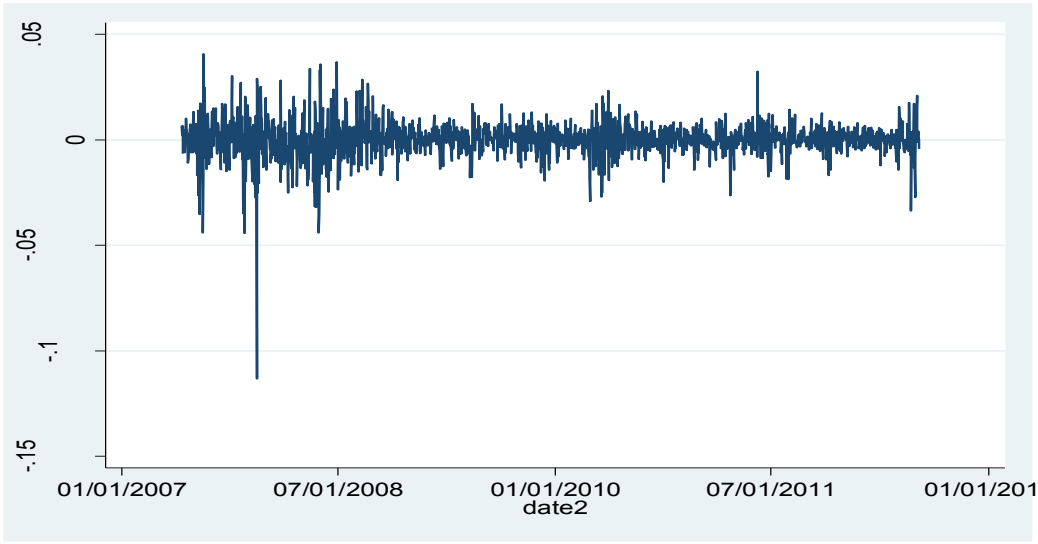


Figure 1: Daily return FBM EMAS Shariah

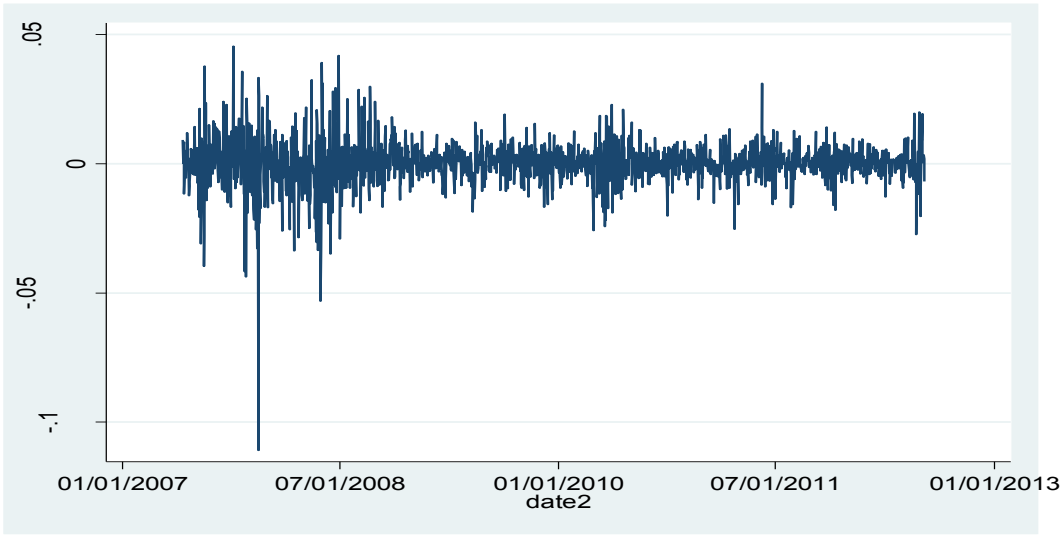


Figure 2: Daily return FBM HIJRA Shariah

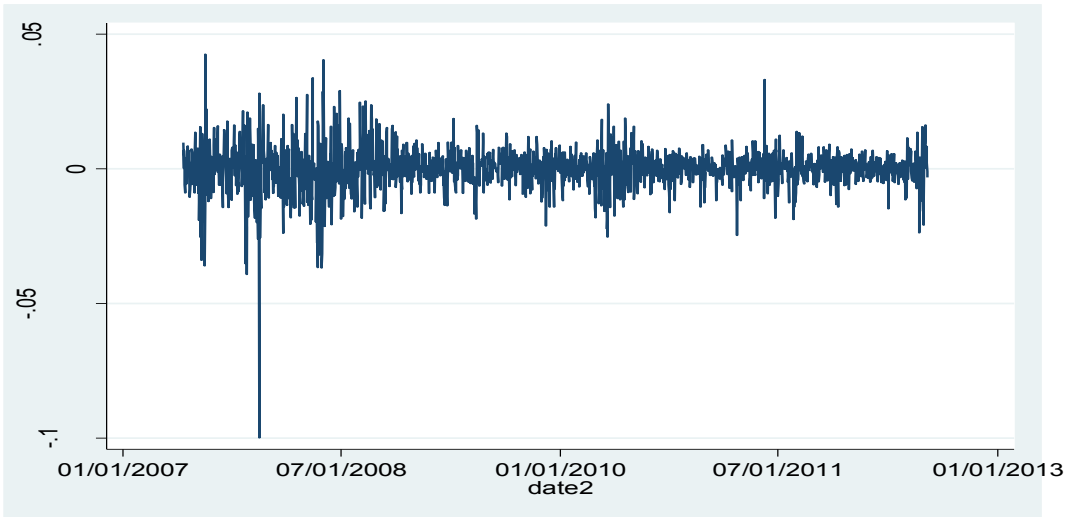


Figure 3: Daily return FBM KLCI

9.2. *Efficiency*

We implement the variance ratio for Lo and Mackinlay (1988) with homoscedastic and heteroscedastic for testing the random walk for both the Islamic and conventional indices, using intervals of 2, 4, 8 and 16 days. Results reveal that we can reject the null hypothesis for the test, (Vr =1), for the three indices (Islamic and conventional), as the Variance ratio values are less than one.

Results presented in Tables 6 to 8, and hence we reject the market efficiency hypothesis for the three indices.

Table 6: Variance Ratio results FBM HIJRA Shariah

Lo and Mackinlay Variance Ratio Statistic for FBM HIJRA Shariah (Table 2)				
Quarter	No. observation	Variance ratio	R_s	P> |Z|
2	1851	0.571	-18.4344	0.00
4	1851	0.279	-16.5767	0.00
8	1851	0.141	-12.4878	0.00
16	1851	0.07	-9.0649	0.00

Table 7: Variance Ratio results FBM EMAS Shariah

Lo and Mackinlay Variance Ratio Statistic for FBM EMAS Shariah (Table 3)				
Quarter	No. observation	Variance ratio	R_s	P> |Z|
2	1851	0.565	-18.6989	0.00
4	1851	0.283	-16.4805	0.00
8	1851	0.143	-12.4586	0.00
16	1851	0.071	-9.055	0.00

Table 8: Variance Ratio results FBM KLCI

Lo and Mackinlay Variance Ratio Statistic for FBM KLCI (Table 4)				
Quarter	No. observation	Variance ratio	R_s	P> |Z|
2	1851	0.569	-18.5442	0.00
4	1851	0.278	-16.5847	0.00
8	1851	0.139	-12.5149	0.00
16	1851	0.07	-9.0586	0.00

Regarding the conventional index (KLCI) our results are in accordance with all previous studies (Gupta ,2011 and Hamid et al 2010). However, we could not find any previous studies for the other two indices (EMAS Shariah index, and the HIJRA Shariah Index), except for the old KLSI index for (Albaity and Ahmad 2009), whose results were similar.

Comparing to the Dow Jones market, according to Hassan (2002) the Dow Jones Islamic market world index tend to be much more efficient than its conventional. However, Guyot (2011) results reveal that this is not comprehensive for all Islamic indices, as for Khamlichi (2014), FTSE global Islamic index was less inefficient than its counterpart, unlike the Dow jones global Islamic index which reported higher efficiency. Although Guyot (2011) reported that the emerging markets indices were the least efficient among the world indices.

9.3. Unit root test

Table 9 present the unit root test results. The results show that we are unable to reject the null hypothesis for the unit root, meaning that all of the indices are non-stationary. Consequently, we executed the same tests on the indices in the first difference. Our unit root test shows that the series are stationary in the first difference, therefore, they are integrated of degree one or I (1). These results are in line with the literature of financial markets, where stock prices tend to be non-stationary in the level form. These results are very important, as we need to rank the data for non-stationary for the long term Johansen co-integration test and a stationary for the causality test and in the same time these results support the rejection of market efficiency.

Table 9: ADF and PP Unit root test results

Augmented Dickey Fuller (ADF) Test (Table 5)						
	Constant			*Trend*		
Variables	*Level*	*First-Difference*	*Conclusion*	*Level*	*First-Difference*	*Conclusion*
LN (KLCI)	*0.72*	*20.479*	*stationary*	*2.156*	*20.49*	*stationary*
LN(EMAS Shariah)	*0.722*	*20.255*	*stationary*	*2.182*	*20.272*	*stationary*
LN(HIJRA)	*0.555*	*20.746*	*stationary*	*2.013*	*20.761*	*stationary*

Philip-Perron (PP) Test (Table 6)						
	Constant			*Trend*		
Variables	*Level*	*First-Difference*	*Conclusion*	*Level*	*First-Difference*	*Conclusion*
LN (KLCI)	*0.667*	*38.652*	*stationary*	*2.087*	*38.653*	*stationary*
LN(EMAS Shariah)	*0.655*	*38.193*	*stationary*	*2.082*	*38.197*	*stationary*
LN(HIJRA)	*0.508*	*38.528*	*stationary*	*1.964*	*38.531*	*stationary*

**results: non-stationary on level but stationary on first difference*

9.4. Long term co-integration

The results for the Johansen co-integration test, which follows the maximum likelihood calculation, are displayed in the Table 10.

The null hypothesis of no co-integration suggests that the relationship between the series is not spurious. The table shows the results of Johansen co-integration in 3 lags determined by the Akaike information criteria. It is clear that there is no co-integrating, and we cannot reject the null hypothesis based on the

maximum eigenvalue and trace statistics. Hence, there is no co-integration among the three indices, and we do not need to proceed for VECM. In other words, there is no co-integration equation or one equilibrium equation; there is no relation between the three indices and we cannot predict one of them using the errors of the other, thus we have a diversification opportunity.

Table 10: Johansen Co-Integration Test Result

	Trace statistic		***Max Eigenvalue***	
Null Hypothesis	*Co-integration*	*Critical Value*	*Co-integration*	*Critical Value*
	Rank	*-5%*	*Rank*	*-5%*
r = 0	*26.325*	*29.68*	*20.8205*	*20.97*
r <= 1	*5.5047*	*15.41*	*4.1501*	*14.07*
r <= 2	*1.3546*	*3.76*	*1.3546*	*3.76*

This result is not in accordance with the results of Khamlichi (2014), as he found co-integration between Islamic and conventional FTSE global, same as Albaity and Ahmad (2009). Their results show a degree of co-integration between the KLCI and KLSI (Shariah index). Furthermore, our results were in accordance with Hakim and Rashidian (2002), who found that DJIMI (Islamic index) is not co-integrated with Wilshire 5000 in a bivariate model. However, they were co-integrated with the three months Treasury bill.

Overall, although our conclusion is different than Albaity and Ahmad (2009), this supports the results of Guyot (2011) as he found the diversification benefit changes through time.

9.5. Short term co-integration

Table 11 below the results for short term co-integration test (Wald Test of Causality).

Table 11: Short term Causal test results

Causal Direction		
	P-Value	***Conclusion (Hypothesis)***
Null Hypothesis		
LNKLCI does not Granger Cause LNHIJRAH	*0.033*	*Reject*
LNEMAS does not Granger Cause LNHIJRAH	*0.033*	*Reject*
LNKLCI does not Granger Cause LNEMAS	*0.208*	*Accept*
LNHIJRAH does not Granger Cause LNEMAS	*0.208*	*Accept*
LNHIJRAH does not Granger Cause LNKLCI	*0.075*	*Accept*
LNEMAS does not Granger Cause LNKLCI	*0.075*	*Accept*

The results indicate that we cannot reject the null hypothesis except for the HIJRA index. We reject the null hypothesis as the p-value < 0.05. Therefore, both KLCI and EMAS Shariah dose Granger cause HIJRA index.

10. Conclusion

The Shariah indices in Malaysia were launched as a response for the increased interest of investors to invest in Shariah compliant securities. The aim of this paper was to test the efficiency of the Islamic indices with comparison to their counterpart and whether both types of indices are different by offering diversification opportunity.

In order to answer these questions, we analysed two Shariah Indices (FBM EMAS and FBM HIJRA Shariah) and the Bursa Malaysia Composite Index (KLCI). The main reason for choosing two Shariah indices is regarding the differences in the listing methodology. Our literature review reveals a variety of results regarding the Islamic market efficiency, dependent on the methodology used for testing. However, most of the studies regarding the composite index of Malaysia (KLCI) reveal inefficiency. As for the diversification, the previous studies were on the old Shariah index (Albaity and Ahmad 2009) and rejected the diversification potential of the market.

In our study we try to examine the weak form efficiency for the three indices. Using Lo and Mackinlay Variance Ratio, our results rejected the market efficiency of the three indices, and the market is inefficient. We have supported our evidence by the unit root test. As for the diversification test, we find new evidence that there is diversification opportunity on both Short and long term. Our results were based on Johanson co-integration test for Long term and Causality test for Short term.

The absence of efficiency makes the market predictable and investors could make money by using historical data. This is crucial, as Islamic Indices should be efficient, as the aim of the Shariah is based on transfer of information. Moreover, the existence of the diversification opportunity means that the indices do not move in the trend and both markets are totally different.

Our study could incentive the Shariah Scholar to prompt the market and their practicing to be in accordance with the Shariah. Moreover, the Revised Shariah screening criterion and the new evidence of diversification brings a potential to the market. Future studies would be necessary for testing the efficiency of the revised methodology.

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Appendixes

Appendix 1: Screen criterion in Bursa Malaysia EMAS Shariah

In 1995, the security commission's SC and the Shariah advisory council, established the screening methodology for listing a company as a Shariah compliant. The methodology consists of two tires, quantitative and qualitative approach.

In the quantitative approach, the first stage is the company's activity. The company will be listed as Shariah compliant if its activity does not involve in one of the following:

1_ Conventional services that is based on *Riba* (interest) or conventional insurance.

2_ Gambling and gaming

3_Manufacring or the sales of Haram (unlawful) product, or any related product such as (liquor, pork, non- halal food and beverage)

4_intertanament activity that is not consistent with the Shariah

5_income from conventional accounts and instruments.

6_any other activity that is considered not consistent with the Shariah.

According to this stage, companies are divided in Shariah or non-Shariah compliant. However, for the mixture companies, that has a main activity that is consistent with the Shariah. However, if it incurs some non-Shariah activity, therefore, these companies should undergo for two stages, quantitative and qualitative.

In the quantitative approach, the SAC will measure the percentage of the non-Halal unlawful activity to total company's activity, this by calculating the profit before tax for this non-Halal activity to the total company's profit, and then compare it to a benchmark listed by the SAC Ijtihad. If the unlawful activity

exceeds the benchmark the company will be considered as no-Shariah compliant. The benchmark is as follow:

1_The five percent bench mark 5%

Activities from Conventional finance (banking and insurance sector), gambling, liquor pork or any related activities, non-halal food and beverages, entertainment and other activities considered non Shariah compliant

2_the ten percent benchmark 10%

Interest returns from conventional (accounts or instruments), tobacco and any related activity.

3_the twenty percent benchmark 20%

Revenue from rental activities of a non Shariah compliant.

4_The Twenty-Five Percent Benchmark 25%

Operational revenues from resort and hotels, share trading and stock broking.

The qualitative assessment

Mixture activities companies should go through two additional criteria. The SAC take into consideration the following:

1_The good image of the company, as the company should have a good public perception.

2_the main activity of the company should be considered as having *Maslahah* (benefit) for the Muslim *Ummah* (nation) and for the public, and the non Shariah compliant activity should be small and involve matters such as *Umum Balawa* (difficult to avoid), *Uruf* (custom) and the right of non-Muslim community which are accepted in Islam (Zainudin et al 2014).

So in order for a mixture company to be listed as a Shariah compliant, it should pass both quantitative and qualitative assessments (Securities Commission Malaysia, 2013a).

Appendix 2: The revised Shariah Screening methodology

By the 18 June 2012, the Security commission of Malaysia has announced for a revised Shariah screening methodology for determining the Shariah compliant companies listed in Bursa Malaysia. This revised methodology comes as an effort to correspond to the global standard expectation. The revised methodology adopts two tires assessments. The quantitative, which consist of business activity benchmark, and a newly introduced financial ratio, while preserving the existed qualitative assessment (Securities Commission Malaysia, 2012).

Quantitative assessment

Business activity benchmark

The first tire is the business activity benchmark. Under the revised methodology it was reduces for two benchmark instead of four, detailed as following:

1_ the five percent benchmark (5%)

The benchmark is applicable for the following activities

- Conventional finance (banking and insurance).
- Gambling activities.
- Liquor and any related activities to it.
- Pork and any related activities.
- Non-halal food including beverages.
- Entertainment activities that is not consistent with the Shariah.
- Interest income from conventional accounts and their instruments.
- Tobacco and any related activities.
- Other activities that is considered not Shariah compliant.

2_ The Twenty Percent Benchmark (20%)

The benchmark is applicable for the following activities

- Operational income form resorts and hotels activities.

- Trading in non Shariah compliant Shares or dealing with their stock brokers
- Rental income from activities that is considered not Shariah compliant.
- Other activities that is considered not Shariah compliant.

The contribution percentage of Shariah non-compliant activities to the overall revenue and profit before tax of the company will be calculated and compared against the relevant business activity benchmarks.

Financial ratio

In the second-tier a newly introduced financial ratio is now used to calculate Riba of Riba-based element within the company Balance Sheet and the ratio should be less than 33%. The ratios are as follow:

- Cash over Total Assets

  Measure the cash invested in conventional accounts and instruments, however, cash invested in Islamic accounts and instrument are excluded
- Debt over Total Assets

Measure interest bearing debt only, other Islamic debt or Sukuk are excluded.

The requirement of this assessment is less than 33%. Moreover, the securities issued by the company should pass both assessments (Quantitative and qualitative) in order to be listed as Shariah compliant security (Securities Commission Malaysia, 2013c).

Appendix 3: FTSE Bursa Malaysia HIJRA Shariah Screening criterion

Yasaar provides the screening services for Shariah compliant regarding FTSE series for Islamic indices, the criteria are as follow:

BUSINESS SECTORS

Companies involved in the following activities will be considered non Shariah compliant:

- Conventional Finance services (Banking and insurance)
- Alcohol
- Pork related products
- Entertainment including gambling (casino), Cinema, Music, Pornography and Hotels etc.
- Tobacco
- Weapons and defence

FINANCIAL RATIOS

- Debt to total asset less than 33 percent.
- Cash and Interest income activities are less than 33 percent total assets.
- Accounts receivable and cash to total asset less than 50 percent.
- Total interest and Haram (non Shariah compliance) activities income of total revenue should not exceed 5 per cent.

Dividend of 5 per cent is considered as a purification for the haram (non Shariah compliance) activity to be paid by the investors.

http://www.yasaar.org/services.htm