

Economic Forces and Islamic Stock Market: Empirical Evidence from Malaysia

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ABSTRACT

Manuscript type: Research paper

Research aims: This study aims to investigate the impact of macroeconomic forces on the Malaysian Islamic stock market.

Design/ Methodology/ Approach: The study employs Auto Regressive Distributed Lag (ARDL) bound testing approach and Vector Error Correction Model (VECM) in an attempt to investigate the impact of macroeconomic forces on the Malaysian Islamic stock market. Various domestic economic factors including money supply, industrial activities, inflation, Islamic interbank rate and international issues (e.g., real effective exchange rate and Federal funds rate), are taken into consideration in the analysis.

Research findings: Based on the ARDL approach, this study finds that all macroeconomic factors, with the exception of Islamic interbank rate are significantly related to Islamic stock price in the long term. However, the findings from VECM method confirm the significant causal flow from all macroeconomic forces into Islamic stock prices in the longer term. Nevertheless, in the short term, only Islamic stock prices have immediate replies in response to the industrial activities, inflation, real effective exchange rate and Federal funds rate data.

Theoretical contributions/ Originality: While there is vast literature on the Islamic stock market, the effect of macroeconomic forces on the Islamic stock price has not been well-researched. This study fills

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in the gap by investigating the relationship between macroeconomic variables and Islamic stock price.

Practitioner/ Policy implications: The findings demonstrate that investors and policymakers should take into account the fluctuations in the macroeconomic variables since they have high information content regarding the future movements of Islamic stock price. The foreign factors, in particular, depict stronger influence on the Islamic stock market than the domestic factors.

Research limitations/ Implications: Cheaper currency would accelerate export sector and recovery of the U.S. economy might put Islamic stock market at disadvantage because there is possibility that international investors will switch back their investment.

Keywords: Economic Forces, Islamic Stock Market, Malaysia

JEL Classification: G00

1. Introduction

Macroeconomics is a branch of economics that deals with the broad aggregates or large-scale indicators that affect the behaviour of the national economy at large. The general instances of macroeconomic variables that can ascertain the boom, recession, or stability of an economic condition includes output, price stability, unemployment rates and exchange rates. The macroeconomic performance of a country, particularly as a sub-segment in the financial system, is typically measured through its stock market. Economists, see for example Damodoran (2006) and Reilly and Brown (2011) have argued that the stock market is a key economic indicator because the information provided by the stock market can assist economists in predicting future changes which can be seen through the economic variables. The stock market can also assist investors in making productive investments by enabling them to build their portfolios efficiently (Arestis, Demetriades, & Luintel, 2001). Empirically speaking, stock market performance can positively affect the economy in several ways such as efficiently mobilising and allocating capital, encouraging saving by maximising returns on savings, raising cheaper funds and increasing profits, enhancing corporate control, and facilitating risk management (Levine & Zervos, 1996; 1998; Abubakar & Kassim, 2016). Thus, a well-developed stock market can increase growth opportunities for a country.

The performance of a stock market is dependent on the macroeconomic variables which are used to predict stock market

movements. In the standard valuation model of discounted cash flows, for example, stock valuation is affected by any changes seen in the expected stream of returns. Stock valuation is also affected by those factors associated with the discount rate of future cash flows. All of these changes affecting stock valuation are the result of the influence caused by the macroeconomic variables (Damodoran, 2006). To capture the influence of the economic trends on asset pricing, the arbitrage pricing theory developed by Ross (1976) can be adopted since the theory permits the use of many factors to explain the systematic investment risks involved. Reilly and Brown (2011) provide some examples of macroeconomic factors that would influence the performance of a stock market which include inflation, interest rates, economic output (as measured by GDP) and major political upheavals. As the macroeconomic variables can affect stock market performance, it is natural to expect the connection between both. This connection is best understood by making reference to aggregate demand and supply framework which are often used to describe the interconnection between money demand and equity market (Ibrahim & Aziz, 2003).

While studies have extensively investigated the link between economic forces and stock prices in the context of conventional markets, research looking at the impact of the macroeconomic forces on Islamic stock prices is rather limited. In this regard, this study aims to contribute towards enriching the literature by focusing on the impact of the macroeconomic forces on the Islamic stock market. Islamic stocks refer to those shares belonging to companies that are involved in permissible activities under Islamic principles.¹ The shares of these companies are approved and periodically reviewed by *Shariah* scholars through a process called Islamic stock screening. The Islamic equity or stock market trades in *Shariah*-compliant stocks. Despite the increasing presence of Islamic stocks on a worldwide basis, empirical studies focusing on the Islamic stock market remain few. Thus, there is a need to study this area of interest. On a global basis, interest in Islamic finance has shifted from bank-based focus to capital market-based instruments (Dewandaru, Rizvi, Bacha, & Masih, 2014). From the perspective of Malaysia, its Islamic capital market has become a growing focus and this is due to investors, be it individuals or institutional investors, demanding more

¹ Information available at <http://www.bursamalaysia.com/market/islamic-markets/products/islamic-capital-market/shariah-compliant-listed-equities> accessed on 20th January 2017.

from their Islamic investments (Al-Khazali, Lean, & Sarmet, 2014). Looking at the Islamic stock constituents of Malaysia, the scenario is quite apparent. The FBM Emas Index (FBMEI), for instance, consists of 276 stocks and 203 of the total stocks (or 74 per cent) are *Shariah*-compliant stocks. In 2013, the *Shariah*-compliant stocks, as reflected by the FBM Emas *Shariah* Index, had performed better than the overall FBMEI stock. Its performance stood at 16.4 per cent as compared to its counterpart standing at 15.8 per cent (Bursa Malaysia, 2014). Although the current study is not making any comparison between conventional stocks and Islamic stocks, the statistics provided highlight the better performance of the Islamic stock market in the Malaysian context.

Between the conventional stock market and the Islamic stock market, there are specific features of difference, particularly in the specification of risk return profile. In this regard, the screening criteria undertaken by the Islamic investment is based on *Shariah* principles which exclude non-compliant companies from its pool of investable equities. Thus, only *Shariah*-compliant companies are considered, resulting in a smaller pool of investable equities with more volatile returns (Dewandaru et al., 2014; Hussein & Omran, 2005). Returns which are more volatile usually depict a riskier market because it contains stocks which tend to have higher correlations with the overall market performance and the business cycle. In this regard, the performance of the Islamic stock market is expected to be highly correlated with the fluctuations of the economy.

The small circle of investable equities bringing more volatile returns as mentioned above can be attributed to the nature of the Malaysian economy which is small, yet highly opened trading nation. The degree of susceptibility of the Islamic stock market towards government interventions or macroeconomic forces such as inflation levels, interest rates or money supplies (irrespective of domestic or global disturbances) can become greater. Consequently, the response generated tends to be different from the response of conventional markets. In this regard, investors focusing on Islamic stocks need to carefully interpret how certain economic forces could affect the Islamic stock market as the outcome it suffers is different from the outcome experienced by conventional stock market. For this purpose, investors need to understand the process of the interaction flow as well as the overall backdrop of Islamic equities.

This study thus aims to collect evidence that can demonstrate the varied effects created by the macroeconomic variables (i.e., money

supply, inflation, industrial activities, exchange rate and interest rate) on the Islamic stock market's performance in the Malaysian context. It is expected that the outcome of this study will shed light on the function of domestic and international disturbances on stock market for investors. By understanding the move of these disturbances, investors can become more sensitive in realising the potential risks and rewards of their investments in Islamic stocks. In addition, the outcome of this study may also help investors to move beyond the decision of investing in general stock selection only by focusing on the performance dynamics so as to make decisions for future market movements. From these advantages gained, investors will be better informed to understand how the macroeconomic data of the future will look like. An awareness of the changes occurring in these macroeconomic variables would enable the investors to be more vigilant of future stock market movements, thereby enabling them to strategise accordingly.

The findings of this study are also expected to offer policy makers the means to be furnished with new information on a continuous basis. A more recent knowledge detailing aspects of the macroeconomic factors should be captured and considered to help strengthening the Islamic stock market further. The findings of this study would also be able to indicate which of these factors need to be given focus for the purpose of ensuring a healthy Islamic capital market development. In particular, policymakers may also be interested in developing more effective policies that are aimed at designing appropriate actions for real applications. For instance, in the case of monetary policy, monetary aggregates and interest rates have often been considered as relevant trigger indicators which can effectively influence stock market vibrancy. This is because they deal directly with the decision made by investors (Yusof & Majid, 2007). If the expansion of money supply is significantly and positively priced in the Islamic stock returns, policymakers may be able to treat this indicator as a suitable target to concentrate on. Otherwise, money supply is not a relevant trigger indicator for monetary policy.

This paper posits itself by focusing on previous studies conducted by Majid and Yusof (2009) and Mohd. Hussin, Muhammad, Abu, and Awang, (2012), and further expands them from a number of perspectives. First, as mentioned by Ibrahim and Yusoff (2001), the choice of monetary aggregates has always been a subject of debate as it reflects the availability of liquid money in the economy and wealth effect. Therefore, instead of using one specific indicator to define money supply which is commonly done in the previous studies, this study will focus

on two money supply indicators namely M2 and M3, to be applied in two different models. Second, the latest sample data, which satisfactorily address some current-specific issues such as recent changes in the U.S. monetary policy, is added. In their study, Majid and Yusof (2009) also included this variable in their model as a way to reflect the effect of international disturbance on the Islamic equity market. However, their observations cover the period of 1997 to 2006 only whilst this study focused on the period between November 2007 to June 2014. However, Mohd. Hussin et al. (2012) excluded this variable. Third, the FBM Emas Shariah Index was used as a proxy to reflect the Islamic stock price. Previous studies which focused on the Kuala Lumpur Shariah Index (KLSI) could not be continued as the entity has been replaced by the FTSE Bursa Malaysia Emas Shariah Index in November 2007. Finally, since the analysis of this study comprises most recent data collected from the FBM Emas Shariah Index, beginning from November 2007, hence it is considered to be the most appropriate proxy for the Malaysian Islamic stock price. It is hoped that this new proxy will create more rooms for fresher discussions.

The remaining part of this paper is organised as follows: Section 2 reviews the literature on the interaction of the Islamic stock market and the macroeconomic variables. Section 3 highlights the methodology of the study by explaining the data and the estimated models used. Section 4 presents the results and Section 5 concludes and provides the implications of the findings.

2. Literature Review

2.1 A Brief Description of the Islamic Stock Market in Malaysia

The Islamic capital market (ICM) made its first debut into the Malaysian economy in 1992 (Majid & Yusof, 2009). It serves as an important and vital component of the whole capital market system in Malaysia and its functions are parallel to its conventional counterparts, acting as a medium for capital lenders and seekers to exchange transactions for investments. The ICM also develops several areas of importance that promote its importance even further. For instance, the advent of the Islamic stock-broking operations, the Islamic unit trusts, the Islamic indices as well as Takaful, are all clearly, ideal dimensions for consumers and investors alike. Simultaneously, in line with the rapid growth of the Islamic finance industry, Bursa Malaysia has also begun to notice

the innovations of the ICM which create new financial products such as *sukuk*, warrants and crude palm oil futures contract. This has led the Islamic capital market to possess its own distinctive characteristic which projects all activities as guided by *Shariah* injunctions. In particular, these activities need to be free from any forbidden elements such as interest (*riba'*), uncertainty (*gharar*), gambling (*maysir*) and other non-permissible activities (Securities Commission, 2009).

In the Islamic capital market, there are two categories of securities, namely Islamic equity and Islamic debt securities. At present, the FBM Emas Shariah and the FBM Hijrah Shariah indices are used to track the performance of *Shariah*-approved investments. These indices were launched in 2007 to replace the KLSE Shariah Index as a means to cater to the high demand of investors seeking to invest, in line with *Shariah* requirements. The first index was designed to benchmark indices while the second index served as tradable indices.² In the context of this study, the FBM Emas Shariah Index is used to represent the Islamic stock price in Malaysia.

When comparing conventional stocks and Islamic stocks, the main difference noticed is the screening criteria used. The Islamic stock market is based on *Shariah* principles while the conventional stock is not. In the past, *Shariah* scholars have been outlining parameters that can help to ascertain whether a particular corporation is 'Islamic' or 'unIslamic' for investment. The screening criteria is based on the quantitative and qualitative screening dimensions. If a company's core activities involve elements such as interest (*riba'*), gambling, (*maysir*), prohibited products or excessive uncertainty (*gharar*), it will be excluded from being *Shariah*-compliant. In this regard, no screening is necessary. Companies with mixed activities (operations include both permissible and non-permissible elements) would be filtered through the qualitative and quantitative screenings. At this stage, qualitative screening looks at the core activities first. These core activities must be free from the four prohibited elements, namely interest, gambling, prohibited products and excessive uncertainty. In the case of mixed business activities, there are three additional requirements: First, the presence of non-permissible activities should not be exceeding the benchmark threshold set by the screening provider. Second, the companies being screened must have a good image. Third, the core activities must have significant contributions

² Information available at: https://www.sc.com.my/post_archive/launch-of-ftse-bursa-malaysia-hijrah-shariah-index-by-mr-ranjit-ajit-singh-senior-executive-director-securities-commission/ accessed on 20th January 2017.

for the public interest or be beneficial to the Muslim community and country. Finally, the prohibited elements that are accepted must only involve matters like common plight, custom and non-Muslim rights.

At the stage of the quantitative screening, certain tolerance benchmarks and financial ratio test will be focused. From this screening approach proposed by the *Shariah* Advisory Council (SAC) of the Securities Commission of Malaysia, the benchmark of tolerance must, first of all, cover 5 per cent of the benchmark activities involving interest, gambling, liquor, tobacco and non-*halal* premises. Secondly, 20 per cent of the benchmark must be placed as rentals received from *Shariah* non-compliant activities and activities considered as public interest such as hotels, resorts and chalets. These benchmarks are computed by dividing the contribution from non-permissible activities with the group's total revenue and group income before tax. In addition, the financial ratio test on balance sheet items such as interest-bearing debts and cash ratio are also being considered. The threshold level of both ratios must not exceed 33 per cent. If either one of the ratios exceeds the threshold level, the company is considered to be a *Shariah* non-compliant company. In brief, if a company is able to fulfil all the criteria required by both parameters of screening, the stock is deemed as Islamic.³

In term of frequency of *Shariah* screening, all *Shariah*-compliant securities are subject to regular re-evaluation twice a year. Both the qualitative and quantitative parameters mentioned above act as a filter, screening companies for revision. Both parameters were enforced in November 2013 as a means to further facilitate the development of the Islamic equity and the fund management, concurrently satisfying domestic and international investors.

2.2 Channel of Interaction between Macroeconomic Variables and Stock Price

2.2.1 Money Supply and Stock Prices

Early studies (Bruner, 1961; Friedman, 1961) had advanced on the positive impact of money supply on stock prices through the monetary portfolio theory. This theory claims that money supply may affect stock prices when acting as an instrument during the transmission process of real economic activities. This occurrence is reflected by

³ Information available at: <https://www.sc.com.my/frequently-asked-questions-on-revised-shariah-screening-methodology/> accessed on 20th January 2017.

the aggregate demand and aggregate supply (AD-AS) framework (see Keynes, 1936; 1973). The framework serves as a macroeconomic model that can explain the price level and output by focusing on the relationship between aggregate demand and aggregate supply. The belief is that when the growth rate of the money supply experiences an abnormal increase or decrease (highly volatile), it adjusts the investors' asset portfolio to disequilibrium (Rozeff, 1974). When this happens, asset prices from these monetary disturbances would then react in a positive manner and subsequently, it affects real aggregate outputs in the economy, positively. This outcome implies that there is a direct positive effect from changes in money supply because greater or lesser money liquidity can stimulate the desire of investors to hold more (or less) stocks in their portfolio. This phenomenon therefore, affects the price of particular selected stocks. Other possible explanations behind this positive relationship may be traced to the indirect effect the variable has on companies' cash flow, where an increase in the availability of money tends to encourage the public to spend more on goods and services. Consequently, this outcome can result in more vibrant economic activities. From this, companies' cash flow can be influenced into responding positively. When this happens, the value of the stock will experience a rise as well.

Looking from another perspective, Fama (1981) suggests that a negative impact can occur when the connection between money growth and inflation is positive. This is caused by an increase in money supply in the mainstream economy which then drives up the prices of goods, thereby, contributing to the unexpected increase in inflation, which is then incorporated into the discount rates. Consequently, it dampens the stock prices. On the other hand, a decrease in money supply would lead to inflationary pressure, thus affecting discount rate accordingly. Nonetheless, if the government implements an economic stimulus that promotes growth in money supplies, it is possible that a company's cash flow can also rise at the same time. This can then create opportunities for stock prices to increase (Maysami & Koh, 2000; Mukherjee & Naka, 1995). In particular, if the government intends to raise liquidity (increase in money growth) through open market operations (selling and purchasing securities) as a means to spur economic growth, it is possible that this type of stimulus may not only lead to a lower interest rate environment but would also increase company's cash flows. Thus, stock prices have the potential to rise. In fact, investors are more likely to be attracted towards switching their asset preference (in this case,

from bond to equity) during a low rate environment because the returns required for purchasing equity tend to be more rewarding.

Some empirical evidences that can support the negative relationship suggested by Fama (1981) can be traced to Wongbangpo and Sharma (2002) who studied five ASEAN countries namely, Indonesia, Malaysia, the Philippines, Singapore and Thailand. They find that the markets in these countries portray high inflation levels which have also caused a negative link between money supply and stock prices. In the Indian market, Hosseini, Ahmad, and Lai (2014) note that the Indian market's weak monetary policy has contributed to the negative relationship between money supply and stock prices. This observation spanned a ten-year period ranging from 1999 to 2009. Reilly and Lewis (1971) validate the hypothesis of the monetary portfolio theory and reach a similar conclusion. Re-examining the interaction of money supply (M2) and stock prices nexus in the wake of the sudden volatility of stock prices in the U.S. market, Dhakal, Kandil, and Sharma (1993) propose that money supply has a significant positive impact on stock prices. Other studies (Ibrahim, 2003; Hosseini et al., 2014) also endorse the same finding. Dhakal et al. (1993) emphasise that money supply should be treated with caution while designing monetary policies because money supply could also be employed to stabilise consumer prices. Looking at the context of China, Hosseini et al. (2014) state that China's strong pro-cyclical monetary policy as well as the public's fund injection into the Chinese stock market have boosted company earnings in a positive way. Consequently, money supply is shown to have a positive impact on the stock market. Following the theoretical relationship suggested in the seminal work of Brunner (1961), it is posited that money supply leads to a positive impact on Islamic stock prices. For this purpose, the following hypothesis is formulated:

H₁: Money supply is positively related to Islamic stock prices.

2.2.2 *Industrial Production and Stock Prices*

Many studies (Engle, Ghysels, & Sohn, 2013; Naik & Padhi, 2015; Ratanapakorn & Sharma, 2007; Shanken & Weinstein, 2006; Binswanger, 2004; Wongbangpo & Sharma, 2002) have acknowledged the positive relationship between industrial production and stock prices. For instance, Shanken and Weinstein (2006) document a revisit of the study conducted by Chen, Roll and Ross (1986), and find that industrial

production plays a significant role in determining stock prices in the U.S. market. In line with this study, Hamao (1988) reports the same findings in Japan. An increased in a company's production during typical expansion lead to the heightened demands in sales, resulting in higher profits. This phenomenon causes investors to be optimistic about future growth of the company, hence causes stock price to rise.

While other variables (i.e., such as inflation, money supply, interest rate and exchange rate) seem to be producing different effects on the five distinct markets (i.e. Indonesia, Malaysia, the Philippines, Singapore and Thailand), industrial production appears to hold a similar relationship with stock price (in all the five markets) (Wongbangpo & Sharma, 2002). However, studies on the Islamic stock market (Majid & Yusof, 2009; Mohd. Husin et al., 2012) show that industrial activities are not related to the movements of Islamic stock prices. These reports indicate that within the Islamic market environment, outcomes can be both consistent as well as divergent. Based on this argument, the following hypothesis is formulated as follows:

H₂: Industrial production is positively related to Islamic stock prices.

2.2.3 *Inflation (Price Level) and Stock Prices*

The relationship between price level and stock prices is neither straightforward nor consistent. Kaul (1987) argues that the relationship between these two variables is dependent on the role of the monetary sector or the changes occurring in money demand and its supply rate.

The relationship between price level and stock prices nexus can also be explained from the dividend discount model. For instance, the negative interaction is found to be due to the incapability of companies to pass on increased production costs to consumers in the form of higher market prices of goods during inflation (Reilly & Brown, 2011). As a result, their cash flow experiences a slow growth hence, profit margins decline. Given this scenario, stock prices are expected to tumble when there is a wide spread between the rate of return (k) and companies' growth (g). In contrast, a positive scenario would imply that a high inflation environment would provide the company an incentive to push higher prices along the increase in production costs. This can cause the cash flow to grow higher. Thus, an increase in the rate of return (k) might be offset by the earnings growth and dividends. Likewise, this can cause an increase in stock values.

Various studies (e.g., Maysami & Koh, 2000; Khil & Lee, 2000; Adrangi, Chatrath, & Sanvicente, 2011; Engle et al., 2013; Naik & Padhi, 2015; Abubakar & Kassim, 2016) support the notion that these two variables (price level and stock price nexus) tend to create a negative relationship but Fama (1981) maintain that the negative relationship could be induced by the negative relationship occurring between inflation and real activities. According to Geetha, Mohidin, Chandran, and Chong (2011), this relationship may subsequently, be explained by the combination of the money demand theory and the quantity theory of money. They examine the expected and unexpected inflation occurring in the stock markets of Malaysia, the U.S. and China. Results suggest that inflation and stock prices are significantly related in the long run but in a negative manner. It is proposed that inflationary pressures can dampen stock markets because they could hurt future company earnings and consequently raise the discount rates, thereby, threatening company's stock values. However, in short run inflation – stock price nexus generally does not exist, except in China. This would have different implication of changes on inflation on stock price in the short run.

The concept of value protection has been invariably mentioned by some researchers (Mohd. Hussin et al., 2012; Saryal, 2007; Ibrahim & Aziz, 2003; Shabri, Meera, Aziz, & Ibrahim, 2001; Khil & Lee, 2000) when a positive effect takes place in the stock market. During the event of inflationary pressures, stock markets could become a potentially preferred place for investors searching for protection of their asset values. This is because most companies (especially those that have the ability to increase the prices of their products and not the users of increased inputs price) have the tendency to maintain higher cash flows for the purpose of taking more profits. For example, Saryal (2007) conducted a comparative study of these two variables by focusing on Turkey and Canada. The results suggest that as Turkey faces high inflation rate, the companies tend to experience higher stock returns. In Canada, low inflation rate had no impact on its stocks. This finding implies that inflation is one of the substantial factors that can be used to explain stock market's volatility in countries experiencing high inflation rates such as Turkey.

In looking at the Islamic stock market, Mohd. Hussin et al. (2012) note that there is a positive relationship between the stock market and inflation. This observation supports the view that the investment stock

market can be used to protect wealth from the threat of inflation. Based on this argument, the following hypothesis is formulated as follows:

H₃: Inflation is positively related to the Islamic stock prices.

2.2.4 *Interest Rate and Stock Prices*

The effect of the interest rate on stock prices can be commonly explained by the standard computation of present values or discount rates. An increase in discount rates can raise the rate of return but dampen stock values. From the perspective of asset portfolio allocations, a rise in interest rates makes other assets such as bonds more attractive because it increases the opportunity costs of holding more cash. This consequently shifts the demand curve leftwards for other assets in the portfolio, thereby, suggesting an inverse interaction. The investors' decision to hold on to their asset allocation or to their portfolios is thus influenced by the change in interest rates.

In focusing on the dimension of interest rates and stock prices, previous empirical works have demonstrated mixed results. Studying the U.S. environment, Abdullah and Hayworth (1993) gathered empirical evidence endorsing the asset portfolio allocation perspective. In contrast, Maysami and Koh (2000) record a contradicting result when focusing on the Singapore market. Examining the relationship between interest rates and stock prices in five different national contexts, Wongbangpo and Sharma (2002) also arrive at inconsistent results. They conclude that the relationship is only supported in Malaysia and Indonesia contexts. It is argued that investors tend to shift from investing in stocks to other assets when the interest rate increase. This is because the rate indicates alternative investment opportunities. It is further asserted that long-term bond rates may act as a better approximation for discount rates in asset pricing when compared to short-term interest rates.

In looking at the Islamic stock markets however, Majid and Yusuf (2009) and Mohd. Hussin et al. (2012) included different proxies of interest rates although it seems clear that Islamic investors should not be driven by interest rates. In their study, Majid and Yusof (2009) used conventional interest rates to represent domestic money market fluctuations. They also included the overseas interest rate of Federal funds rate (FFR) as a measure to reflect the external disturbance. Their findings imply that there is a positive relationship between both the domestic and foreign interest rates and the Islamic stock returns. They

argue that a higher rate of returns in interest-bearing securities do not prevent investors from buying *Shariah*-compliant stocks since the Islamic stock price would increase with the growing interest rates. Comfortable with just the domestic Islamic interbank rates, Mohd. Hussin et al. (2012) omitted any foreign/external variables such as exchange rate and Federal funds rate in their study. They find that Islamic interbank rates could not be considered as a feasible variable in explaining the Islamic stock prices. Based on this argument, the hypothesis is formulated as follows:

H₄: Interest rate is positively related to Islamic stock prices.

2.2.5 Exchange Rate and Stock Prices

The relationship between the exchange rate and stock prices has been acknowledged in financial economics literature. In this area, two models namely, the flow-oriented model of exchange rate developed by Dornbusch and Fischer (1980) and the portfolio-balance model of exchange by Branson (1983) and Frankel (1983) are used to explain the association. According to the flow-oriented model of exchange rate, currency fluctuations affect the trade balance position and global competitiveness, hence becoming an indicator of the national output level. This can also influence a company's cash flows and stock values. The second model however, claims that the exchange rate fluctuations may affect the supply and demand for a particular asset such as stocks (Zhao, 2010). Thus, an intervention by the government in the forex market would result in investors adjusting their portfolio in anticipation of the impact of exchange rate movement on the asset prices and return.

Previous studies draw inconsistent findings. Aggarwal (1981) and Roll (1992) provide support that depreciating currency can generate export growth as the volume of sales increase. Such a phenomenon will therefore, increase companies' cash flows which, indirectly, heighten stock prices. Similarly, Chiang and Yang (2003) find a significant positive cointegration between stock returns and currency values in nine Asian markets. Phylaktis and Ravazzolo (2005) investigated the association between exchange rates and stock prices based on the U.S. and Pacific Basin with data for the period of 1980 to 1998. They find that the U.S. stock is positively associated with foreign exchange rates. In contrast, Ibrahim and Aziz (2003) suggest that currency depreciation increases production costs thereby, increasing domestic prices. A similar result

is detected in the Singapore and Korean stock markets (Maysami & Koh, 2000; Kwon & Shin, 1999). This kind of scenario tends to reduce profits and stock prices and such negative associations tend to persist in countries that are highly dependent on imported materials for their industries. In particular, stock prices in import-oriented countries might be adversely affected by currency depreciation as firms in these countries have to face more expensive inputs due to weaker currency.

Zhao (2010) however, does not find any evidence that could support the relationship between exchange rate and stock price in the China market. This is possibly due to the China's government policy which maintains that the floating exchange rate regime is based on market supply and demand. Within the same market, Cuestas and Tang (2015) demonstrates a contradicting result. They find a significant causality relationship between stock returns and exchange rate.

Majid and Yusof (2009) and Mohd. Hussin et al. (2012), as mentioned earlier, have reached an analogous conclusion, depicting the negative association between exchange rate and stock prices. They argue that as currency depreciates, production costs for domestic companies will rise. This will, in turn, hurt a company's profit and stock values. Based on this argument, the hypothesis is generated as follows:

H₅: Exchange rate is negatively related to Islamic stock prices.

2.3 Measuring Interaction

In this study, the focus is on investigating the impact of macroeconomic forces on stock prices. The interaction between these two variables is commonly assessed using the Vector Auto Regression (VAR) analysis which adopts the cointegration test of Johansen-Juselius and the Vector Error Correction Model (VECM) for testing causation effects. The VAR and VECM methods have been adopted by various studies including Dhakal et al. (1993), Ibrahim and Aziz (2003), Ibrahim (2003), Wongbangpo and Sharma (2002), Zhao (2010), and Mohd. Hussin et al. (2012) to measure the interactions between the macroeconomic forces and stock prices.

However, since this study aims to test several macroeconomic variables which will be subsumed into a model, this study employs the Autoregressive Distributed Lag (ARDL) bound testing approach. Although the VAR approach is well-recognised within this discipline,

the technique could also result in a poor estimation, if a finite sample is added with many variables (Kassim & Manap, 2008).

3. Data and Methodology

3.1 Data

The proxy for Islamic stock returns to be used in this study is Bursa Malaysia Emas Shariah Index (henceforth denoted as FBMESI).⁴ On the determinants of Islamic stock returns behaviour, selected macroeconomic variables that have been commonly used will be examined, namely money supply (M2 and M3), industrial production index (IPI), consumer price index (CPI), and Islamic interbank rate (IIR) to represent domestic factors. In this study, two foreign factors - real effective exchange rate (REER) and Federal funds rate (FFR) are also being included to reflect international disturbances. Incorporating these factors are pertinent, since foreign shocks could influence the way monetary policy is being implemented (Kassim & Manap, 2008). Since the U.S. is one of the most powerful economies in the world, the decision made by the U.S. Federal Reserve Bank often inevitably affects the global financial market. The REER is the nominal exchange rate against a weighted average of the country's major trading partners, adjusted to the level of inflation, while the FFR is a short-term interest rate determined by the U.S Federal Reserve Bank.

Consistent with other studies in this field such as Majid and Yusof (2009) and Mohd. Hussin et al. (2012), monthly data were used. In this study, the data covers the period from November 2007 when FBM Emas Shariah Index was launched by Bursa Malaysia. The sample ends in July 2014 due to the availability of data at the point of conducting the research. Macroeconomic data were sourced from Bank Negara Malaysia (2014), International Financial Statistic, and the U.S. Federal Reserve website while stock index is retrieved from Bloomberg (2014).

3.2 Empirical Framework

The current study employed two major tests, namely autoregressive developed lag (ARDL) and vector error correction model (VECM). The first approach is to investigate the existence of long run relationship and the latter is adopted for further inferences that enable us to explore

⁴ Bursa Malaysia has replaced Kuala Lumpur Shariah Index with Bursa Malaysia Emas Shariah Index starting November 1, 2007.

short run and long run dynamic interactions and causal relations. The procedures of both models are explained in the following subsections.

3.2.1 ARDL Bound Testing Approach

According to Majid and Yusof (2009), the macroeconomic variables should be cointegrated if they affect the Islamic stock price. Hence, to find the long run cointegration between selected macroeconomic variables and Islamic stock price, cointegration technique of ARDL bound testing approach was employed in this study. The ARDL approach was initially developed by Pesaran, Shin, and Smith (1996). The ARDL approach is employed in this study as it is a better technique that addresses the weaknesses of two most commonly used cointegration techniques i.e. Engle-Granger (EG) and Johansen and Juselius (JJ). The application of EG and JJ cointegration test would require unit tests as a prerequisite for subsequent analysis because variables with non-stationary data cannot be modelled as they are unpredictable. This will introduce the degree of uncertainty into the analysis of level relationship. Consequently, the result may become spurious. Additionally, EG technique is inappropriate to be employed in a multivariate model because it is based on the assumption that there is only one cointegrating vector that connects all the variables (Saibu & Nwosa, 2011; Pesaran, Shin, & Smith, 2001).

Owing to the above flaws, the ARDL test seems to be a suitable alternative, in which this technique can be applied despite of stationary properties of the variables or in other words, it can be applied even if the variables are I(0), I(1) or mutually cointegrated. Furthermore, this technique is not susceptible to sample size. The ARDL model also takes sufficient number of lags to capture data generating process in a general to specific modelling framework (Kassim, 2013; Laurenceson & Chai, 2003). The estimation of the baseline models in this study are as follows:

$$FBMESIt = \alpha_0 + \alpha_1 M2_t + \alpha_2 IPI_t + \alpha_3 CPI_t + \alpha_4 IIR_t + \alpha_5 REER_t + \alpha_6 FRF_t + \varepsilon_t \quad (1)$$

$$FBMESIt = \alpha_0 + \alpha_1 M3_t + \alpha_2 IPI_t + \alpha_3 CPI_t + \alpha_4 IIR_t + \alpha_5 REER_t + \alpha_6 FRF_t + \varepsilon_t \quad (2)$$

Where:

FBMESI : FTSE Bursa Malaysia Emas Shariah Index

M2 : M2 Monetary aggregate

M3 : M3 Monetary aggregate

IPI : Industrial Production Index

- CPI : Consumer Price Index
- IIR : Islamic interbank rate
- REER : Real effective exchange rate
- FRF : Federal funds rate
- α : Coefficient
- ε : Error term

The error correction version of ARDL framework pertaining to equations (1) and (2) can be re-expressed as follows:

$$\begin{aligned} \Delta \ln \text{FBMESI}_t = & \delta_0 + \sum_{i=1}^{\infty} \theta_i \Delta \ln \text{FBMESI}_{t-i} + \sum_{i=1}^{\infty} \varphi_i \Delta \ln \text{M2}_{t-i} + \sum_{i=1}^{\infty} \phi_i \Delta \ln \text{IPI}_{t-i} \\ & + \sum_{i=1}^{\infty} \gamma_i \Delta \ln \text{CPI}_{t-i} + \sum_{i=1}^{\infty} \delta_i \Delta \ln \text{IIR}_{t-i} + \sum_{i=1}^{\infty} \nu_i \Delta \ln \text{REER}_{t-i} \\ & + \sum_{i=1}^{\infty} \xi_i \Delta \ln \text{FFR}_{t-i} + \lambda_1 \ln \text{FBMESI}_{t-1} + \lambda_2 \ln \text{M2}_{t-1} + \lambda_3 \ln \text{IPI}_{t-1} \\ & + \lambda_4 \ln \text{CPI}_{t-1} + \lambda_5 \ln \text{IIR}_{t-1} + \lambda_6 \ln \text{REER}_{t-1} + \lambda_7 \ln \text{FFR}_{t-1} + \mu_{1t} \end{aligned} \quad (3)$$

$$\begin{aligned} \Delta \ln \text{FBMESI}_t = & \delta_0 + \sum_{i=1}^{\infty} \theta_i \Delta \ln \text{FBMESI}_{t-i} + \sum_{i=1}^{\infty} \varphi_i \Delta \ln \text{M3}_{t-i} + \sum_{i=1}^{\infty} \phi_i \Delta \ln \text{IPI}_{t-i} \\ & + \sum_{i=1}^{\infty} \gamma_i \Delta \ln \text{CPI}_{t-i} + \sum_{i=1}^{\infty} \delta_i \Delta \ln \text{IIR}_{t-i} + \sum_{i=1}^{\infty} \nu_i \Delta \ln \text{REER}_{t-i} \\ & + \sum_{i=1}^{\infty} \xi_i \Delta \ln \text{FFR}_{t-i} + \lambda_1 \ln \text{FBMESI}_{t-1} + \lambda_2 \ln \text{M3}_{t-1} + \lambda_3 \ln \text{IPI}_{t-1} \\ & + \lambda_4 \ln \text{CPI}_{t-1} + \lambda_5 \ln \text{IIR}_{t-1} + \lambda_6 \ln \text{REER}_{t-1} + \lambda_7 \ln \text{FFR}_{t-1} + \mu_{1t} \end{aligned} \quad (4)$$

Equations (3) and (4) consist of two parts. First part with the summation signs (\sum_n) refers to the error correction dynamics and second part represents long run estimates as reflected by the terms with λ_s (Kassim & Majid, 2008). Note that all data are expressed in natural logarithm form. The null hypothesis is defined by $H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = \lambda_7 = 0$, where it means there is no cointegration exists in the long run relationship. This hypothesis will be tested against the alternative hypothesis of $H_a: \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq \lambda_6 \neq \lambda_7 \neq 0$, by the means of the F-test.

Prior to the cointegration testing, all variables were converted into logarithm form to obtain a constant elasticity in the models. In the first part of ARDL approach, optimal lag-length need to be selected. This step is important as it may influence the ultimate findings of this study. To determine the lag-length of time series variables, there is a number of selection criteria proposed in econometric studies. Nevertheless, this study only reports Akaike information criterion (AIC) and final prediction error (FPE), since they appear to be the most suitable for small sample size (Liew, 2004). The second step consists of conducting bounds F-statistics to each model involved. This step is conducted to ascertain whether long run cointegration exists. For this part of analysis, the F-statistics value generated from the test was compared against

to those critical values of bounds statistics provided in Pesaran et al. (2001). Two sets of critical values were compared with the F-statistic value. The first set assumes they are all purely I(0) and the other set assumes a purely I(1).

The results might fall into three situations, first, if F-statistics is lower than its critical value, it means the variables tested have no long run association or purely not cointegrated, I(0). Second, if F-statistics is greater than its critical value, the variables have long run relationship or purely cointegrated, I(1). Third, if F-statistics fall within the critical value, the relationship of the variables is inconclusive or mutually cointegrated, which means it is uncertain whether the variables are related or not in the long run.

3.4.2 Vector Error Correction Model (VECM)

Since the ARDL approach only ascertains the interaction of variables in the long run, this study adopted another approach, namely VECM. This method is adopted for further inferences as it provides information of both short run and long run behaviour of the parameters in the model. This subsection sketches the causality procedures between the stock returns and the variables of economic forces based on the VECM framework. The expression of multivariate causality test based on this framework, following the system made by Wongbangpo and Sharma (2002) is as follows:

$$\begin{aligned} \Delta \ln \text{FBMESI}_t = & \alpha_1 + \beta_1 \text{ECT}_{t-1} + \sum_{i=1}^n \theta_i \Delta \ln \text{FBMESI}_{t-i} + \sum_{i=1}^n \phi_i \Delta \ln M2_{t-i} \\ & + \sum_{i=1}^n \phi_i \Delta \ln \text{IPI}_{t-i} + \sum_{i=1}^n \gamma_i \Delta \ln \text{CPI}_{t-i} + \sum_{i=1}^n \delta_i \Delta \ln \text{IIR}_{t-i} \\ & + \sum_{i=1}^n \nu_i \Delta \ln \text{REER}_{t-i} + \sum_{i=1}^n \xi_{ii} \Delta \ln \text{FFR}_{t-i} + \varepsilon_t \end{aligned} \quad (5)$$

Where Δ represents the symbol of first difference operator. Under this framework, the equation is automatically converted into first difference operator. α reflects the vector of cointegrating parameters while β is the vector of error correction coefficients measuring the speed of convergence to the long run steady state (Kassim & Manap, 2008). k is the lag-length and $\theta, \phi, \gamma, \delta, \nu, \xi$ are the estimated parameters of the variables $\text{FBMESI}, M2, M3, \text{IPI}, \text{CPI}, \text{IIR}, \text{REER}$, and FFR , and ε_t is an $n \times 1$ vector of residuals. This framework contains information of short run and long run dynamics. Here, the expression of the parameters is to capture the coefficients of the short run dynamics, and error correction term for long run dynamic.

Equation (5) observes two channels of causation, namely the joint significance of the lagged differences of the explanatory variables using the Wald test and the significance of the coefficient of the lagged error-correction term (t-statistic). The F-statistic (Wald test) on the explanatory variables represents the short run causal effect, and t-statistic on the coefficient of the lagged error correction term represents the long run causal relationship (Narayan & Smyth, 2008). Independent variables do cause the dependent variable in the short run, if F-statistic based on the null hypothesis that the set of coefficients ($\theta, \xi, \varphi, \omega, \rho, \tau$) on the lagged values of independent variables are statistically different from zero, hence null hypothesis is rejected. On the other hand, both the independent and dependent variables have a stable relationship in the long-run, if $\alpha\beta$ is significant (different from zero) based on the t-statistics (Kassim, 2013). From these tests, the direction of causality among variables may fall into four patterns of interactions: (i) a unidirectional causality from a variable, x to y; (ii) vice versa to (i); (iii) bidirectional; and (iv) independent causality between x and y. Finally, CUSUM test was employed to ascertain the goodness of fit of selected ARDL model, as proposed by Brown, Durbin, and Evans (1975). The CUSUM test employs the cumulative sum of recursive residuals based on the first set of observations and is updated recursively and plotted against the break points (Kassim & Manap, 2008; Bahmani-Oskooee & Ng, 2002).

4. Empirical Findings

4.1 Descriptive Statistics

Table 1 provides the summary statistics of the variables (i.e. variables are in first difference) included in this study. The descriptive analysis provides a preliminary description of the nature and volatility of the variables used. Among the variables, money supply registered the highest mean of 13.9, followed by Islamic stock price at 9.18 and inflation at 4.68. In terms of volatility, Federal funds rate was observed to be the most volatile, with the highest standard deviation of 1.12, followed by the Islamic stock price at 0.21 and money supply at 0.18. Obviously, this result is predictable since during the period of subprime mortgage crisis, the U.S Federal Reserve Bank has invariably, reduced its short-term interest rate as a means to stabilise the stock market.

Table 1: Descriptive Statistic

	FBMESI	M3	IPI	CPI	IIR	REER	FFR
Mean	9.18	13.94	4.68	4.69	1.03	4.59	-1.63
Median	9.22	13.92	4.69	4.69	1.10	4.59	-1.90
Maximum	9.50	14.22	4.79	4.75	1.27	4.66	1.50
Minimum	8.67	13.60	4.52	4.62	0.59	4.53	-2.66
Std. Dev.	0.21	0.18	0.05	0.04	0.18	0.03	1.12

Note: FBMESI = FTSE Bursa Malaysia Emas Shariah Index; M3 = Monetary aggregate; IPI = Industrial Production Index; CPI = Consumer Price Index; IIR = Islamic interbank rate; REER = Real effective exchange rate; FRF = Federal funds rate; α = Coefficient; ε = Error term.

4.2 Unit Root Test

Under the ARDL approach, it is not necessary to ascertain the order of integration for the underlying regressors because the order of integration, regardless of any regressor, are all $I(0)$, $I(1)$, otherwise, they would be mutually cointegrated. Duasa (2007) assert that the unit root test needs to be conducted in order to determine the applicability of the ARDL model. Based on this assertion, the time series properties of all the variables selected were verified through a common unit root test – the Augmented Dicker Fuller Test (ADF) and the Phillips-Perron (PP) test. The purpose was to determine whether the variables used were stationary or otherwise. As shown in Table 2 and Table 3, all the variables had unit root at levels, however, they became stationary after the first differencing $I(1)$ except for \ln IPI which remained stationary at both levels. At the first difference, under the PP test, \ln IPI had a 1% significance level. Nonetheless, the results appear to be mixed as a result of the \ln IPI which was integrated at $I(0)$ thus, the outcome confirms that it is possible to proceed with the model.

Table 2: Stationary Test of Variables on First Difference – ADF

Variable	Level		First difference	
	No Trend	Trend	No trend	Trend
<i>ln</i> FBMESI	-0.28	-2.82	-7.09*	-7.31*
<i>ln</i> M2	-1.86	-2.52	-8.88*	-8.94*
<i>ln</i> M3	-1.65	-2.25	-8.47*	-8.50*
<i>ln</i> IPI	-2.36	-3.34	-16.06*	-16.05*
<i>ln</i> CPI	-1.87	-2.11	-3.52*	-8.70*
<i>ln</i> IIR	-2.20	-1.70	-8.76*	-7.91*
<i>ln</i> REER	-2.25	-2.28	-7.82*	-7.77*
<i>ln</i> FFR	-3.01	-2.71	-5.84*	-6.07*

Note: * denotes 1 % level of significance. The critical values given in the test report is -3.514426 at the 99% significance level.

Table 3: Stationary Test of Variables on First Difference – PP

Variable	Level		First difference	
	No trend	Trend	No trend	Trend
<i>ln</i> FBMESI	-0.80	-2.91	-7.32*	-7.51*
<i>ln</i> M2	-1.79	-2.87	-8.95*	-9.00*
<i>ln</i> M3	-1.59	-2.55	-8.48*	-8.51*
<i>ln</i> IPI	-4.42*	-5.27*	-16.06*	-16.59*
<i>ln</i> CPI	-1.94	-2.20	-8.76*	-8.70*
<i>ln</i> IIR	-1.98	-1.88	-7.17*	-7.22*
<i>ln</i> REER	-2.41	-2.53	-7.76*	-7.69*
<i>ln</i> FFR	-2.98	-2.31	-5.84*	-6.05*

Note: *denotes 1 % level of significance. The critical values given in the test report is -3.514426 at the 99% significance level.

4.2 Results of the ARDL Analysis

The first step in using the ARDL approach is to determine the optimal number of lags or lags length, on the first differenced variable, in both Equations (3) and (4). Bahmani-Oskooee and Bohl (2000) mention that the results following this step are usually sensitive to the lag-length.

This study thus followed the recommendation of Bahmani-Oskoe and Ng (2002) who suggested that the lag order of 12 may be imposed on the first difference of each variable as a means of computing the F-statistics for the joint significance of the lagged levels of the variables. However, in this paper, the lag orders that were imposed for Equations (3) and (4) were only up to eight due to the inadequate number of sample observations even though determination was based on monthly observations (Majid & Yusof, 2009). The small sample period (November 2007 to July 2014) is due to the fact that the FBMESI was established only in November 2007. Table 4 reports on the selected computed F-statistics for lag-length of all the models and it seems that for both Models 1 and 2, the computed F-statistics are significant, standing at one and eight lag orders. This indicates that the null hypothesis has to be rejected at the 1 per cent level with no cointegration occurring. This is because the statistics had generated an opposite result, suggesting that there is an equilibrium relationship between the selected macroeconomic variables and the Islamic stock prices being reviewed. These preliminary results imply that they are likely to move together in the long run.

Before running the ARDL estimation, the most appropriate lag-length criteria was determined. To determine the lag-length of time series variable there are numbers of selection criteria proposed in economic studies.⁵ Nevertheless, this study used the appropriate lag length as suggested by Akaike (1973). Liew (2004)⁶ mentions that this is a better choice for smaller samples. The model was tested with the “General to Specific Approach” in order to get the parsimonious specifications. Here, the insignificant variables except for the level variables and the intercept, must be retained.

Table 4: F-statistics for Testing the Existence of a Long-Run Equation

Lag-length	Model 1 (M2)	Model 2 (M3)
1	5.686***	5.453***
8	5.978***	5.889***

Note: The relevant critical value bounds for both models are given in Pesaran et al. (2001) (with unrestricted intercept and no trend; the number of regressors = 6). They are 3.15 – 4.43 at the 99% significance level; 2.45 – 3.61 at the 95% significance level; and 2.12 – 3.23 at the 90% significance level. *** denotes that F-statistic falls above the 99% upper bound.

⁵ Among the instances are Akaike information criterion (AIC), Schwartz information criterion (SC), Hannan-Quinn criterion (HQC), final prediction error (FPE) and Bayesian information criterion (BIC).

⁶ Large sample is assumed to contain 120 or more observations, stated by Liew (2004).

Table 5 shows stronger results when compared to the previous model thus confirming the significant relationship between stock price and macroeconomic variables in the long run.

Table 5: F-statistic of Cointegration Relationship (in Parsimonious Specification)

Lag-length	FBMESI (Model 1)	FBMESI (Model 2)
8	14.530***	10.234***

Notes: The relevant critical value bounds for both models are given in Pesaran et al. (2001) (with unrestricted intercept and no trend; the number of regressors = 6). They are 3.15 – 4.43 at the 99% significance level; 2.45 – 3.61 at the 95% significance level; and 2.12 – 3.23 at the 90% significance level. ***denotes that F-statistic falls above the 99% upper bound

By normalising the Islamic stock returns, the empirical findings of the long-run ARDL model were obtained. They are presented in Table 6. Results indicate that there is cointegration relationship between the set of macroeconomic variables namely *M2*, *IPI*, *CPI*, *IIR*, *REER* and *FFR* for Model 1, and the *M3*, *IPI*, *CPI*, *IIR* and *FFR* for Model 2. The significance of the respective variable towards the Islamic stock price behaviour was analysed individually. Results indicate that all the variables except *IIR*, are significantly related with the Islamic stock price which is proxied by FBMESI. In terms of the multivariate cointegration, results indicate that the set of macroeconomic variables (excluding Islamic interbank rate) such as money supply, industrial production, inflation, exchange rate and Federal funds rate can have an important influence on the Islamic stock price behaviour in Malaysia, as has been noted by existing literature. However, the channel of effect, as shown by the signs of variables' coefficients appear to be mixed.

It is observed that money supply changes (proxied by *M2* in Model 1 and *M3* in Model 2) and the Islamic stock price in Malaysia are positively correlated, as has been acknowledged by prior studies (Mukherjee & Naka, 1995; Ibrahim, 2003; Maysami & Koh, 2000; Hosseini et al., 2014), particularly on conventional stock markets. There are at least two views that could explain this positive relationship. One is the direct positive liquidity effect on the mainstream economy in the stock market where investors may desire to hold more stocks due to excess money. Another is the indirect effect acquired through real economic

activities where excess money contributes to an increase in a company's profits (Maysami & Koh, 2000; Mukherjee & Naka, 1995). The studies assert that injecting money supply can create an expansionary effect that boosts companies' earnings thereby, causing stock prices to rise. Consequently, it can be deduced that easy access to credit facilities is likely to encourage companies to expand their operating activities as well as to finance future projects (Fama, 1990).

From the perspective of stock returns and industrial productions (*IPI*), the results obtained also indicate a positive association. This finding endorses the common notion that an increase in real economic activities can lead to higher company profits, both current and expected. This phenomenon will in turn, adjust the demand curves for the stocks, hence, shifting rightward and causing stock prices to rise. It is apparent that companies' cash flows reflect the relationship between the industrial activities and the Islamic stock prices. Thus, it can be deduced that the results noted here are consistent with prior studies (Shanken, 2006; Binswanger, 2004; Wongbangpo & Sharma, 2002; Kwon & Shin, 1999; Fama, 1990; Chen et al., 1986). Moreover, results drawn from the Islamic stock market perspective also indicate an outcome that was similar to Mohd. Hussin et al. (2012). In the context of this study, both models 1 and 2 suggest a positive relationship between inflation (*CPI*) and stock price. This finding echoes the findings of previous studies (Khil & Lee, 2000; Ibrahim, 2001; Ibrahim & Aziz, 2003) which focus on Malaysia's conventional stock market. It appears that the findings of this study are inconsistent with those observed in other neighbourhood countries (see Maysami & Koh, 2000; Wongbangpo & Sharma, 2002). Three plausible reasons may help to explain this occurrence. First, through the concept of protection value, the Malaysian stocks served as a protection against inflation as they represent claims from real assets. The higher the inflation rate, the higher the demand for a particular Islamic share. Second, since the relationship between inflation and the stock market is significant and positively related, the role of money supply in influencing the positive relationship between the two exists. Consequently, when there is an expansion in money supply, investors could use the stock market as a safe haven (Kaul, 1987). Third, it appears that most *Shariah*-compliant companies are able to transfer the increase in cost input to their customers when there is an increase in inflation.

This can lead to an increase in profit margins, consequently increasing the value of the stocks (Reilly & Brown, 2011).

Table 5 shows the relationship between domestic interest rate (*IIR*) and stock prices. The results indicate that the relationship is positive but insignificant in both Models 1 and 2. This finding is predictable given that the Muslim investors, as claimed by Majid and Yusof (2009) and Mohd. Hussin et al. (2012), will not be driven by interest rates in making investment decisions. However, it has to be reminded that Muslim investors have a choice to either invest in Islamic stocks or fixed-income securities. Here, interest rates are used as a benchmark in measuring the cost of the funds and the pricing of fixed income securities including Islamic fixed income securities such as *sukuk*. In addition, investors in the Islamic stock market are also made up of Muslims and non-Muslims as well as foreign investors, all of whom may not be interest rate driven. Here, it is found that the Islamic interbank rate is not significant and this is possibly because the market participants are not commonly driven by the interest rates. The Kuala Lumpur Interbank Offered Rate (KLIBOR) offers a preferable benchmark rate for security issuers in the pricing decision and also for investors making investment decisions. The rate quoted by the KLIBOR is widely recognised and accepted.

Besides the above, this study also discovers that when the Federal funds rates decrease, the performance of the Islamic stock market improves and vice versa. It is also observed that, due to the existence of the cointegration between the Federal funds rates and the Islamic stock price in the long run, country-specific factors have become less important during the period of instability in the global market. A possible explanation for this outcome can be attributed to the fact that, since 2007 until present, the Federal funds have been hovering at the lowest level because of subprime mortgage crisis. This phenomenon has resulted in more international investors pulling out from the lower yield investments in the U.S. market and investing in the emerging Islamic markets including the Malaysian stock market which consists of 76 to 88 per cent *Shariah* compliant stock market capitalisations. Consequently, an escalation in stock prices occurs. In the same line of argument, an increase in Federal funds rate may cause non-Muslims and other international investors to flee from the Malaysian stock market for a relatively more attractive U.S. market. Likewise, this phenomenon can cause a capital outflow, hence, resulting in a drop in the Malaysian

currency and trading in stock markets. The finding of this study confirms the influence of the FFR on the Islamic stock market. Furthermore, the susceptibility of the Islamic stock market towards the external shock is also due to the presence of international investors who make up almost a quarter of the total market capitalisation of securities ownership in the Malaysian stock market (Bursa Malaysia, 2014).

Additionally, results drawn from this study also indicate that Models 1 and 2 demonstrate a significant positive relationship between real effective exchange rate (*REER*) and Islamic stock prices. This shows that currency deterioration is related to an increase in Islamic stock prices. The result obtained in this study is consistent with the findings of previous studies (Aggarwal, 1981; Roll, 1992; Chiang & Yang, 2003; Phylaktis & Ravazzolo, 2005). However, prior studies focusing on the Malaysian context had mainly asserted opposite results. It is deduced that this could be caused by some countries' dependence on international trade; the higher the dependence, the higher the negative relationship (Ibrahim, 2003; Majid & Yusof, 2009; Mohd. Hussin et al., 2012). While the Malaysian economy is highly dependent on international trade, the current account balance depicts an economy that is export-oriented. The data external trade balance from 2007 to the latest available data indicates a positive net in balance. This implies that domestic companies export their outputs abroad with much tenacity. Therefore, companies with larger export orientations will directly benefit from the devaluation because the demand for more output will increase (Shapiro, 2006). Since a higher volume of sales can result in higher earnings, stock prices are also likely to be affected. If domestic companies are users of imported input as a result of the depreciation in currency, production costs will rise and this can dampen companies' profits. In other words, low profits can depress stock prices.

Overall, the results of this study are consistent with most of the available empirical evidence, in terms of significance between variables. However, they digress in terms of the channels of effect of few macro forces. Since this study is based on prior studies that are concentrated on the Islamic environment, the consistency of results are compared with Majid and Yusof (2009) and Mohd. Hussin et al. (2012) as reported in Table 7.

Table 7: Consistency of Results (Long Run Analysis)

Variables	Current study	Authors	
		Majid and Yusof (2009)	Mohd. Hussin et al. (2012)
M3 (M2) and stock price	Positive	Positive (=)	Negative (≠)
IPI and stock price	Positive	Insignificant	Positive (=)
CPI and stock price	Negative	n.a ₁	Positive (≠)
IIR and stock price	Positive	n.a ₂	Insignificant
REER and stock price	Positive	Negative (≠)	Negative (≠)
FFR and stock price	Negative	Positive (≠)	n.a ₃

Note: (=) denotes consistency, whilst (≠) denotes inconsistency with the current findings. Majid and Yusof (2009) omitted the inclusion of inflation in their analysis and rather using conventional Treasury bills to represent domestic interest rate, therefore we denote them as n.a₁ and n.a₂, respectively. Mohd.Hussin et al. (2012) did not consider the foreign shocks in their analysis, as denoted by n.a₃.

4.3 VECM Analyses

For further inferences, the VECM was utilised for analyses. The significance of the cointegrating equation of the lagged error correction term represented the long run causality. The short run causality test was determined through the significance of the lagged differences of the explanatory variables by using the Wald test (Odhiambo, 2009). The long run causality of particular variables is said to exist if the error correction coefficient is negatively significant. The short run causality is said to exist if the p-value of the F-statistics (Wald test) is lesser than 0.001 (Pesaran et al., 1996). Table 8 reports the results of the causality tests.

As shown in Table 8, it appears that the long run causality exists under both Models 1 and 2 (see the ECT_{t-1} value). These findings are consistent with those of the ARDL model. The findings confirm the existence of the significant relationship among variables where the causality flow runs from the macroeconomic variables to the Islamic stock prices. In other words, these results imply that the macro trends

of money supply ($M2$ and $M3$), industrial production index, inflation, Islamic interbank rate, real effective exchange rate and Federal funds rate, are essential elements which act as a 'navigator' in steering the Islamic stock market for the long term. This signals to investors not to overlook the macro data under review so as to prepare for the unwelcome (as well as welcome) scenarios about to evolve in the years to come, for example, slow (high) growth, high (low) inflation, slow (high) growth in money supply, depreciation (appreciation) in the *ringgit* and low (high) U.S. interest rate. This is because such economic news contain immense information about the future trends of stock prices. From the policymaking perspective, it appears that all the significant variables are suitable targets to be given focus, for the purpose of reading future market movements.

Table 8: Multivariate Causality Based on VECM

	Dependent variables		Independent variables				
	Δ FBMESI	Δ M2	Δ IPI	Δ CPI	Δ REER	Δ FFR	ECT_{t-1}
Δ FBMESI	-	1.51 (0.21)	2.22* (0.06)	2.76** (0.03)	2.29* (0.06)	2.67** (0.03)	-0.32*** [-3.71]
Δ M2	0.98 (0.48)	-	0.58 (0.79)	1.51 (0.21)	0.85 (0.57)	1.16 (0.37)	-0.01 [-0.67]
Δ IPI	0.60 (0.77)	0.59 (0.77)	-	0.79 (0.62)	1.02 (0.45)	0.80 (0.61)	-0.78 [-1.07]
Δ CPI	0.87 (0.56)	0.46 (0.87)	0.65 (0.73)	-	0.73 (0.67)	0.24 (0.978)	0.001 [0.13]
Δ REER	0.45 (0.88)	0.51 (0.84)	0.54 (0.82)	0.32 (0.91)	-	0.51 (0.84)	-0.01 [-1.12]
Δ FFR	1.57 (0.19)	1.11 (0.39)	0.54 (0.81)	0.39 (0.92)	0.94 (0.51)	-	0.51 [1.81]
	Δ FBMESI	Δ M3	Δ IPI	Δ CPI	Δ REER	Δ FFR	ECT_{t-1}
Δ FBMESI	-	1.29 (0.30)	2.22* (0.07)	2.56** (0.04)	2.32* (0.06)	2.47** (0.04)	-0.313*** [-3.54]
Δ M3	1.28 (0.30)	-	0.47 (0.86)	1.53 (0.20)	0.83 (0.59)	1.05 (0.43)	-0.00 [-0.05]

Δ IPI	0.56 (0.80)	0.54 (0.81)	-	0.78 (0.63)	1.20 (0.39)	0.73 (0.67)	-0.00 [-0.05]
Δ CPI	0.78 (0.62)	0.51 (0.84)	0.65 (0.73)	-	0.67 (0.71)	0.25 (0.98)	-0.04 [-0.41]
Δ REER	0.41 (0.90)	0.49 (0.85)	0.52 (0.83)	0.32 (0.95)	-	0.47 (0.86)	0.03 [1.08]
Δ FFR	1.59 (0.18)	1.12 (0.39)	0.95 (0.50)	0.86 (0.56)	0.48 (0.86)	-	0.03 [1.49]

Note: *, ** and *** represent significance at the 10%, 5% and 1% levels, respectively. F-statistics in () and probabilities for t-statistics in [] ECT_{t-1} is derived by normalizing the cointegrating vectors on the dependent variables, producing residual r. By imposing restriction on the coefficients of each variable and conducting Wald test, we obtain F-statistics for each coefficient in all equations. Figures in the parentheses and squared parentheses represent F-statistics and probabilities for t-statistics, respectively.

The short run causation, on the other hand, is reflected through the F-statistics (Wald test) under the variables coefficients. Based on Table 8, four variables: changes in industrial activities, inflation level, real effective exchange rate and overseas interest rate, appear to be responsible for causing the Islamic stock price fluctuations in the short run. Overall, it is interesting to note that the findings suggest that the macroeconomic variables do not affect Islamic stock prices both in the short and long-run. This view supports Chen et al. (1986) who propose that stock prices usually respond towards external factors without any negation.

Finally, to ascertain the stability of the models that contain both the long run coefficients and the short run dynamics, the CUSUM test was applied. It was observed that as long as the CUSUM statistic stood (see the solid line in the Figure 1) within the critical bound values of 5 per cent significance level (see the two dotted lines in the Figure 1 and 2), the model could be considered to be stable and free from serial correlations. This confirms that the null hypothesis of the coefficient constancy cannot be rejected at 5 per cent level. As depicted in Figure 1 and Figure 2, the CUSUM tests provide evidence which shows that both models have significant structural stability. To check the fit of the equation, actual/ fitted/ residual test was run for both models. The results are displayed in Figure 3 and Figure 4. Essentially, the results reflect a stable model with no structural break.

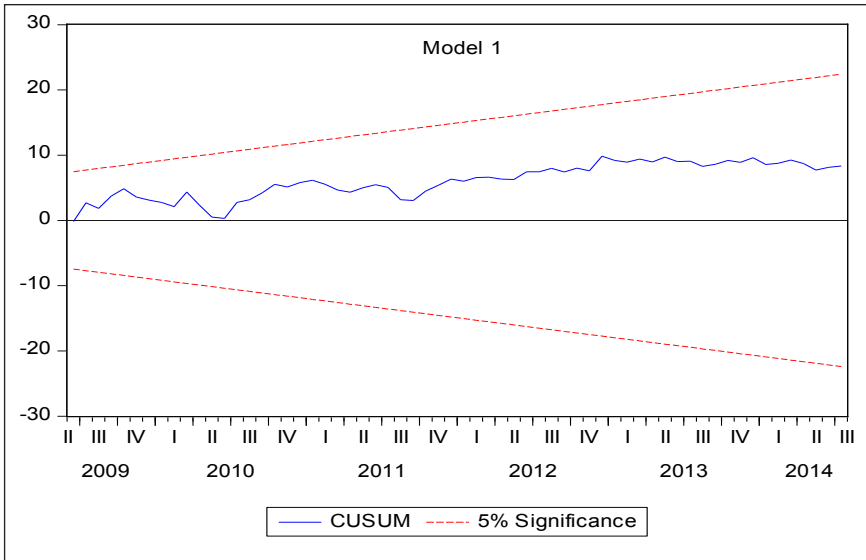


Figure 1: CUSUM test to check models' stability (Model 1)

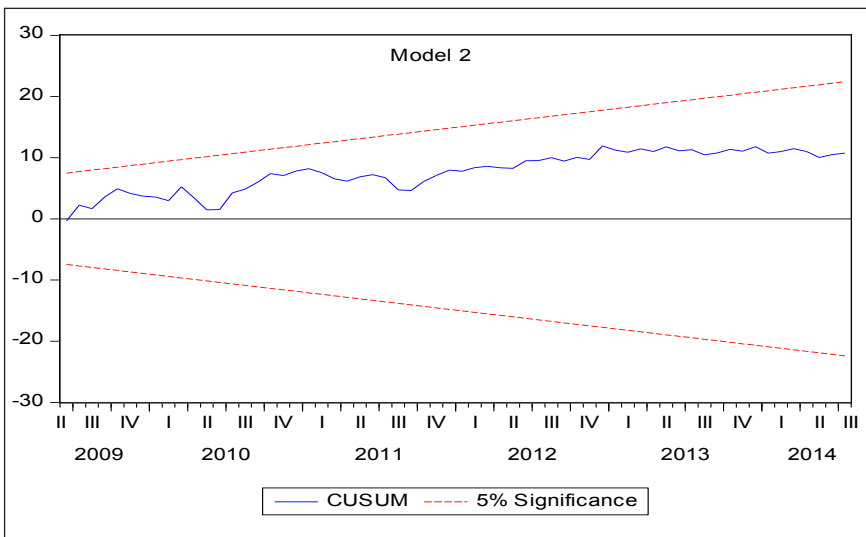


Figure 2: CUSUM test to check models' stability (Model 2)

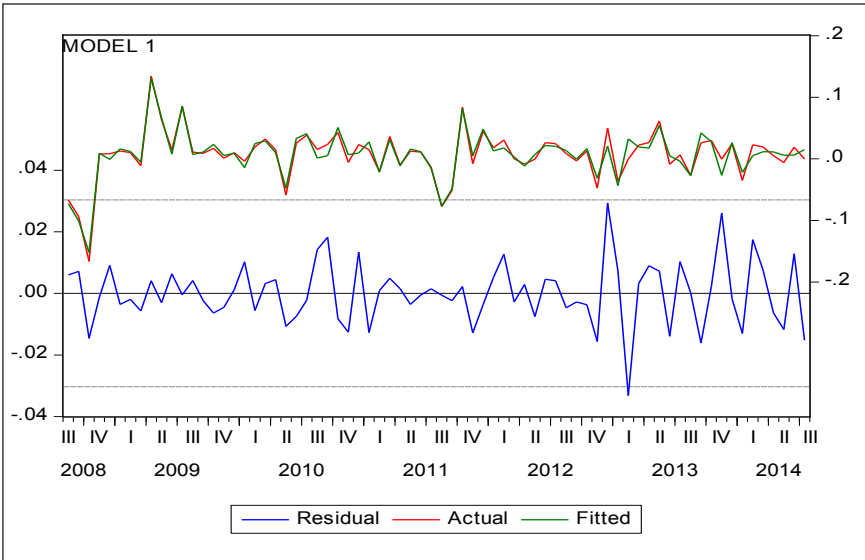


Figure 3: Actual/Fitted/ Residual Test to Check the Fit of Equation (Model 1)

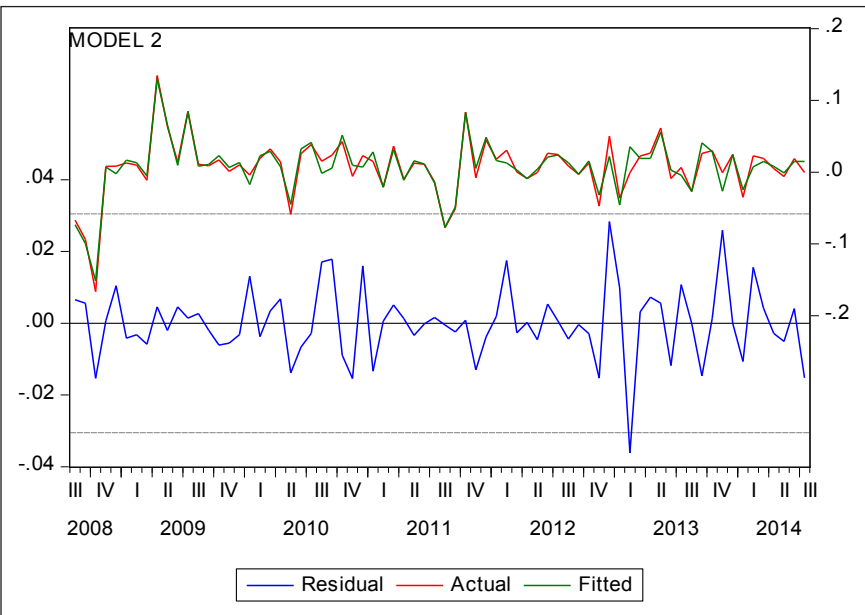


Figure 4: Actual/Fitted/ Residual Test to Check the Fit of Equation (Model 2)

5. Conclusion and Implications

While prior studies had enthusiastically measured the link between macroeconomic forces and stock prices within the conventional environment, empirical studies looking at the Islamic stock market had remained scarce, despite its greater volatile and budding returns, particularly in the context of Malaysia. Hence, it raises the question of “To what extent are the Islamic stock prices susceptible to the macroeconomic conditions?” This leads to the investigation of the effect of the macroeconomic forces on the behaviour of Malaysia’s Islamic stock prices. Domestic macro factors such as money supply (M2 and M3), industrial activities, inflation, Islamic interbank rate and two international factors which comprise real effective exchange rate and Federal funds rate were taken into consideration for analysis. The monthly observations covering the period of November 2007 to July 2014 were used and data were extracted from various sources such as BNM’s Monthly Statistical Bulletin, the International Financial Statistic (IFS), the U.S.Federal Reserve official website and Bloomberg’s. To find their interactions, the ARDL bound testing approach and the VECM technique were applied.

The findings of this study indicates that all the macroeconomic variables included in the model, with the exception of the Islamic interbank rate, have significant long-term relationships with the Islamic stock prices albeit with mixed channels of effect. Both the monetary aggregates of M2 and M3 have a positive relationship with stock prices where the direct and indirect liquidity effect caused by real economic activities could be the reason causing this positive relationship. The industrial activities also seem to affect the stock prices positively, thereby, supporting the common view that vibrant economic activities usually lead to higher stock prices, as a result of the company’s earnings and cash flow. Positive inflation causing stock price relation (higher inflation) was also found to be associated with an increase in the Islamic stock value. This indicates that the inflationary pressures benefitted *Shariah*-compliant companies because producers have the incentives to transfer high cost inputs caused by the rise in inflation to consumers. It also seems that the Islamic stock market is a good ‘protector’ for the value of assets. The pro-cyclical monetary policy practiced by the government had inevitably, led to this positive conclusion. As is evident of the insignificant Islamic interbank rate, the stock price relation appears to be predictable, given the interest-free nature of Muslim investors in making investment decisions. Nevertheless, the findings

are quite perplexing when it is found that the stock price is negatively related with Federal funds rate, with their correlation being among the highest. This evidence suggests that investors who invest in Islamic stocks are still under the influence of interest rates. As explained earlier, the Islamic stock market participants also consist of non-Muslims and foreign investors who could be interest rate driven. Nonetheless, the Islamic stock market seemed to be vulnerable to the foreign variable shock rather than the domestic interest rate. When compared, the difference is seen to be positive. A plausible reason that can explain this benefit during the period of instability, as is happening in major countries, particularly in the U.S., is that there is a loss of confidence among international investors who no longer see U.S. as a safe haven for their portfolio diversification. It is likely that these investors may perceive low return rates from such investments. Consequently, these investors chose to pull out their capital and invest in emerging Islamic markets which offer higher return rates. Additionally, the phenomenon may also be due to the optimistic expectations of investors because they recognise the potential of the Islamic finance industry which would be growing more rapidly in the future. Moreover, the effect of the financial turbulence has not fully recovered in major markets. Further to that is the positive relationship exists between real effective exchange rates and stock prices (Duasa, 2007). It is worth noting that, of all the macroeconomic variables applied, it is the international factors that seemed to have a higher correlation with the Islamic stock price fluctuations. Moreover, for further inferences, the VECM test was used to determine the causation effect. The evidence provided verifies that there is a causal flow running from all the macroeconomic variables to the Islamic stock prices, in the long run as well as short run basis. Nonetheless, the effect of money supply on the Islamic stock prices is not significant in the short run.

The Malaysian macroeconomic data contain an immense information content which can forecast the future movements of the Islamic stock prices. They are able to anticipate the variations, both short and long run. Thus, investors as well as policymakers should be vigilant of the fluctuations noted in the macroeconomics variables. This is because the results can explicitly indicate that the Malaysian Islamic stock market is a macro-driven market. Ignoring these essential facts may result in investors missing the bedrock of successful investments in the future which could result in policymakers moving into the wrong direction.

Owing to the greater vulnerability of the Islamic stock market towards the international factors of real exchange rate and the U.S Federal funds rate, it is deduced that if policymakers advocate a cheaper currency, it might accelerate the export sector. It might also invigorate the Islamic stock market because both are positively related. In addition, the recovery of the global economic outlook may place the Islamic stock market at a disadvantage because there is a possibility that the international investors may revert their investments back to their original country once the U.S Federal Reserve starts to raise its interest rates. This concern applies to both the long term and short term investors because the co-movements are significant for immediate and long term responses. While the decision of the foreign policy is beyond the control of Malaysian regulators, it is also unfeasible to hope that the foreign interest rate will be kept low forever. Consequently, this may complicate the policymaking of monetary management.

It is essential to note here that this study includes a small sample period therefore, it is based on small size observations. A larger incorporation of data in the analysis would have been favourable because they may offer a richer insight and a more accurate interpretation of the behaviour of the Islamic stock market. Additionally, the interpretation made here in response to the interaction between foreign factors and the Islamic stock prices could have been underpowered and temporary because it only covered the 'gloomy' economic period.

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