PROCEEDINGS

2ND INTERNATIONAL ISLAMIC HERITAGE CONFERENCE 2017

2nd International Islamic Heritage Conference 2017

المؤتمر الدولي الثاني للتراث الاسلامي

"STRENGTHENING KNOWLEDGE, EMPOWERING ACHIEVEMENT"

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PROCEEDING OF 2ND INTERNATIONAL ISLAMIC HERITAGE CONFERENCE (ISHEC 2017)

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Heritage Conference 2017

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Foreword

بسم الله الرحمن الرحيم

Bismillahirrahmanirrahim. All praise to Allah SWT. Blessing and Prayers be upon Prophet Muhammad SAW, and also to his family members, kindred's, companions and his followers who adhere faithfully to his teaching.

I would like to express my gratitude for this invitation to write a few words in conjunction of this proceeding. Heartiest congratulations go to the organizers of the 2nd International Islamic Heritage Conference 2017 (2nd IsHeC2017) that was held on 14th – 15th November 2017. Congratulations also to the editors for their efforts in publishing the articles presented at the 2nd IsHeC2017.

Proceeding of 2nd International Islamic Heritage Conference 2017 is a very noble effort as it adds to the corpus of literature on Islamic based research in various disciplines of knowledge. I hope that this proceeding can be a catalyst for the germination and strengthening of Islamic knowledge.

Finally, I wish to extend my sincere appreciation to all parties involved in the publication of this proceeding especially Academy of Contemporary Islamic Studies (ACIS) UiTM Melaka, Center for Islamic Philanthropy and Social Finance (CIPSF), Pusat Jaringan Industri, Komuniti dan Alumni (PJI & A) UiTM Melaka and the authors for their contribution.

DATUK PROF. MADYA SABARIAH MAHAT

Rektor,
Universiti Teknologi MARA Cawangan Melaka,
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2nd International Islamic
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Preface

In the name of Allah, the Most Beneficent, the Most Merciful. All praise is due to Allah SWT, the Almighty. We all praise Him, seek His Help, and ask for His Forgiveness. We seek refuge with Him from the evil of our souls, and from our sinful deeds. He whom Allah SWT guides, no one can misguide him, and whoever Allah SWT misguides, no one can guide him. Blessings and prayers upon His Messenger Prophet Muhammad SAW. We would like to express our thorough and sincere gratefulness to Allah the Almighty, who has given us the opportunity to write, edit and complete the *Proceeding of 2nd International Islamic Heritage Conference 2017.*

We wish to extend our appreciation to YBhg. Datuk Associate Professor Sabariah Hj. Mahat, Rector of Universiti Teknologi MARA (UiTM) Cawangan Melaka for her full encouragement in ensuring the success of the 2nd IsHeC2017 and also the publication of this proceeding. Special thanks to YBrs. Associate Professor Dr. Shafinar Ismail, Deputy Rector of Research and Industrial Linkage UiTM Cawangan Melaka for her continuous support in 2nd IsHeC2017.

A great deal of appreciation also goes to the Center for Islamic Philanthropy and Islamic Finance (CIPSF), Uni-Charity Society, ACIS UiTM Cawangan Melaka and UiTM Press for their tremendous effort in making the 2nd IsHeC2017 a success.

This proceeding comprises the articles that were presented in 2nd IsHeC2017 which held on 14 hingga 15 November 2017 at Avillion Hotel Melaka.

Hopefully, the *Proceeding of 2nd International Islamic Heritage Conference 2017* will give a clearer view of various contemporary issues in Islamic-based research in this country and the Muslim world as a whole. Finally, we hope that this proceeding may inspire and motivate its readers in initiating attempts and contributions for the sake of Muslim ummah.

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THE IMPACT OF MACROECONOMIC VARIABLES ON FTSE BURSA MALAYSIA EMAS SHARIAH INDEX

Siti Nurulhuda Binti Ibrahim[1], Zuraini Abdul Hamid, Amirudin Mohd Nor, Fahmi Abdul Rahim & Noraznira Abd Razak

ABSTRACT

This research will focus on the relationship between selected macroeconomic variables and Islamic stock market in Malaysia. The objective of this research is to examine the impact of Aggregate Money Supply (M3), Kuala Lumpur Interbank Offer Rate (KLIBOR), Exchange Rate of Malaysian Ringgit-United States Dollar (EXRATE), Industrial Production Index (IPI), Consumer Price Index (CPI), Gold Price (GOLD) and Crude Oil Price (COP), which is combination of monetary, production and commodity toward FTSE Bursa Malaysia Emas Shariah Index (FBMES). In order to achieve the objective, this study applies the Ordinary Least Square using heteroskedasticity robust variance-covariance estimator (VCE robust) and used monthly data over the period of April 2007 - April 2016 from authorized sources which is DataStream (Thompson Reuters). The study revealed that there is a significant relationship between FTSE Bursa Malaysia Emas Shariah Index and the selected variables, namely EXRATE, IPI, CPI, GOLD and COP. However, FTSE Bursa Malaysia Emas Index is found negative, and not significantly affected by KLIBOR. Besides that, we need to exclude M3 due to high correlation with the CPI. This study is important for those market participants, especially for investors and fund manager who need to understand the behavior of the stock market in order to make a right decision in making an investment.

Keywords: Macroeconomic Variables, Islamic Stock Market, Malaysia.

INTRODUCTION

The movement of stock market price is an important indicator to enhance the stability of economic performance of any nation. Positive growth of stock market simply depicts a country with progressive development and vice versa. Moreover, the prices of the stock market are determined by demand and supply of company stock. Meanwhile, the Kuala Lumpur Composite Index (KLCI) and Kuala Lumpur Shariah Index (KLSI) are related to the movement of economic growth in Malaysia which can be proven by looking back to the history of KLSI in the year 2000 whereby the movement of Syariah Index increased about 13.79%. This increasing trend was in line with the movement in actual GDP in Malaysia in the year 2000 with 8.3%. While in 2004, KLCI indicated a growth with 18.2% which is in line with the positive growth of the actual GDP in that year (6.8%). In 2011,

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the actual GDP in Malaysia showed an increase of about 5.29% and in that year the FBMES (KLSI was deactivated and replaced by this index) implied a growth of only 2.41%. Meanwhile, in 2014, when FBMES recorded a high growth of about 24.35%, this was in line with the actual GDP in 2014 to 6.01%. This result proved that the general growth of Malaysian Economy is related to the growth of indexes in KLCI and KLSI (now FBMES).

Over the past few decades, the interaction of share returns and the macroeconomic variables has been a subject of interest among academics and practitioners (Kwon & Shin, 1999). Previous studies have documented the existence of significant relationship between stock markets with selected macroeconomic variables in certain countries. Since economic conditions provide an impact on the changeability of the stock market, this unstable condition builds uncertainty towards many parties. Previous findings found various economic indicators effected the fluctuation of stock market, but much of the researches have showed inconsistent results across countries and time because commonly, different studies provide different results. In Malaysia, its stock markets have been left unexplored due to their small sizes and geographic locations (Hussin, Muhammad, Razak, Gan Pei, & Nurfakhzan, 2013). Moreover, according to Rashid, Hassan, & Yein, (2014), Islamic capital markets are still emerging and the studies related to performance whether involve factors or impacts to Malaysian Islamic stock market are still rare. Although, the empirical studies investigating the issue on developed markets are expanding, but empirical analyses for emerging markets such as Malaysia are rather limited. As refer to Hussin, Muhammad, Abu, & Awang, (2012a), many studies had studied upon the relationships between stock returns and macro variables in developed countries such as the US, Japan and European. However, regional stock markets such as Malaysia still not been fully explored.

According to Hussin et. al., (2013), many studies have been carried out on the relationship between stock returns and macro variables, though not with gold and oil prices. Gold and oil owing a special features and roles which is practically significant to investigate how these two commodities are able to influence macroeconomic variables in the economy. Due to the almost non-existent amount of research on the topic, it is useful to fill this gap.

With regards to the essential of this topic for market practitioners and other participants, therefore this research aims to investigate the real situation in Malaysian stock market especially in the scope of shariah compliant stock market by using different indicators namely Aggregate Money Supply (M3), Kuala Lumpur Interbank Offer Rate (KLIBOR), Exchange Rate of Malaysian Ringgit-United States Dollar (EXRATE), Industrial Production Index (IPI), Consumer Price Index (CPI), Gold Price (GOLD) and Crude Oil Price (COP), which is actually the combination of monetary, production and commodity. These variables might be likely to give a positive or negative impact to the Islamic stock market changes.

This study is therefore justified by the neglect of the combination of monetary, production and commodity toward FTSE Bursa Malaysia Emas Shariah

Index (FBMES), the limited number of academic studies available especially on aggregate money supply (M3), gold and oil price-stock price relationship, different of coverage period and data analysis, and the fact that some Islamic stock market, like in Malaysia, remains unexplored in the literature. Our findings indicate that all variables except KLIBOR directly give significant impact on FTSE Bursa Malaysia Emas Shariah Index and cause fluctuation of stock price periodically. Meanwhile we need to omit the M3 due to highly correlation with CPI (proxy of inflation) which create a multicollinearity problem. This is in line with our first expectation of highly correlated between these two variables as M3 is used by economists to estimate the entire money supply within an economy, and by governments to direct policy and control inflation over medium and long-term periods. It also consistent with Rashid et. al., (2014) as they also dropped one of these two variables due to highly correlated. Therefore, by just examine the impact of these six independent variables, this study will expect to contribute valuable information especially to market participants which will help and enabling them to make a better decision for their investment.

This paper divided into several sections and the outline is as follows: section 2 will provide a review of previous literature on the relationship between macroeconomic variables and stock market; section 3 will highlights the data used in this research and the estimation technique applied to analyze the said data; section 4 discusses the estimation results; and finally, section 5 concludes the study.

The effect of money supply aggregate on stock prices

The effect of money supply aggregate on stock prices, however, can be positive or negative. A striking finding in the study points towards a negative relationship which is significant between the KLSI and the M3 money supply while Mukherjee & Naka (1995), Maysami and Koh (2000) and Maysami et. al (2004) found that the relationship between both variables is a positive one. Dhakal et. al (1993) and Mukherjee & Naka (1995) indicated that this positive relationship can be noticed through economy encouragement feature. This is a basis for money supply to increase towards the increase of the corporate profit and this will further increase the future cash flow and result in an increase in stock price. The negative relationship can be observed by looking at the direct relationship (positive) between money supply and inflation. In this direct relationship, the increase in the money supply would cause inflation problems as well as will increase the discount rate and further decrease the price of the stock market (Fama, 1981).

The relationship between interest rate and stock price

The relationship between interest rate and stock price are in negative form. The increase in interest rate will increase the free risk nominal rate and at the same time will increase the discount rate (Abdullah & Hayworth, 1993). As a result, the price of the stock will decrease (Mukherjee & Naka, 1995). On the other hand, Abdullah & Hayworth (1993) proved that the interest rate can influence the level of corporate profit through expectation where the investor will get higher dividend

in the future. Most of the companies support their equipment and inventory through loans. Reduction in the interest rate will cut down the cost of borrowing and at the same time it provides an incentive for the company to expand their operation. Consequentially, the future expected value of the company will increase. This statement also agreed by Maysami et. al (2004) that explained that most of the stock is bought through the money the investor borrowed from financial institutions. The increase in interest rate will increase the cost of buying stocks. When this happens, the demand towards the stock will decrease and at the same time decrease the price of the stock. In other way, the study done by Sangmi & Hassan, (2013) examine the effect of macroeconomic variables on the stock price movement in Indian Stock Market. Six variables of macro-economy (Inflation, Exchange Rate, Industrial Production, Money Supply, Gold Price, Interest Rate) are used as independent variables, while Sensex, Nifty and BSE 100 are indicated as dependent variable. The result show that the interest rate only influences significantly on BSE100, but not for the other two indexes

Meanwhile, according to Othman & Masih, (2015), the positive long-run relationship between the overnight KLIBOR and the FTSE Bursa Malaysia EMAS Shari'ah Index but the negative long-run relationship between the overnight KLIBOR and both BIMB Holdings Bhd. and Syarikat Takaful Malaysia Bhd. stocks. Nevertheless, the magnitude of the overnight KLIBOR coefficients appears abnormally high along with OPR coefficients of which the magnitude seems close to that of overnight KLIBOR. Since BNM uses KLIBOR as the official indicator of Malaysia's interbank money market, BNM's monetary policy stance reflected by the OPR may directly target KLIBOR. Thus, the overnight KLIBOR and OPR coefficients should indicate a collective effect of conventional interest rates on Islamic finance in Malaysia, all else equal.

The exchange rate levels and changes affect the performance of a stock market

Mukherjee &Naka (1995) and Wongbangpo & Sharma (2002) among others, indicate that both exchange rate levels and changes affect the performance of a stock market. Stock prices can have either positive or negative relationship with the foreign exchange rate. Any changes in the value of the exchange rate will give a big impact towards the price of the stock. Mukherjee & Naka (1995), Maysami & Koh (2000) and Ibrahim & Aziz (2003) proposed that the relationship between these two variables are in positive form. Looking at the situation where there is a decrease in value of the currency can prove this. This causes the product that is being exported from this country to become cheaper in the international market. As a result, the volume of the export from that country will increase and cause higher cash inflows, profits and increase the stock prices of the domestic companies. Ibrahim & Wan (2001) shared a different perspective. They believed that the relationships between these two variables are negative. They believed that if the country depends on the export, the decrease in currency value will increase the growth of export. Nevertheless, the decrease in currency value will increase

the cost of production impact as well as increase the domestic price. As a result, the profit margin in the company will decrease.

Index of industrial production (IPI) represents the status of production

Index of industrial production (IPI) is a measurement which represents the status of production in the industrial sector for a given period of time compared to a reference period of time. Naik & Padhi's (2012) reveals that while exchange rate and short-term interest rate insignificantly influence stock prices, money supply and index of industrial production were positively related to stock prices while inflation negatively affects asset prices. Ratanapokorn & Sharma (2007) investigated the short- and long-run relationship between US stock price index and macroeconomic indicators from 1975-1999 by using a Johansen's cointegration approach and VECM. The study suggested that money supply, industrial production, inflation and exchange rate positively affect stock prices. The long-term equation shows that the KLSI values are positively correlated with the IPI variable. There is a positively correlated result found by Fama (1990), Chen et. al (1986) for a study in the United States, Mukherjee & Naka (1995) for a study in Japan, Kwon & Shin (1999) for a study in South Korea, Maysami & Koh (2000) and Maysami et. al (2004) for a study in Singapore, Wongbangpo & Sharma (2002) and Ibrahim (2003) for data collected in Malaysia. The share analysis theory based on the discounted cash flow model also states that the IPI shares a positive correlation with a particular firm expected future cash flow. This means that the higher the IPI, the higher the expected share price. It should also be pointed out that the positive relationship between the two variables is significant.

The effect between inflation with Islamic share price

The study conducted by Fama (1981), Mukerjee & Naka (1995), Maysami & Koh (2000) and Wongbangpo & Sharma (2002) indicate that there is a negative effect between inflation with Islamic share price. These scholars proved that if the inflation rate increases, this would also increase the firm's production costs, which in turn would decrease the future cash flow and would later decrease the share value, production and profit of that particular firm. Meanwhile, from the economic perspective, inflation will increase the cost of living; people will shift their investment capital to consumption (Talla, 2013). While Geske & Roll (1983) and Mukherjee & Naka (1995) point out that this negative relationship can be detected by looking at the increase of the inflation rate which will result in a strict economic policy. When this thing happens, the free risk nominal rate will increase and at the same time the rate of discount will also increase. This will in turn cause a decrease in the stock price. However, other researchers indicate that these two variables have a positive relationship. Khil & Lee (2000), Ibrahim & Aziz (2003), Shabri et. al (2001) and Ibrahim (2003) specified this relationship through the concept of protection value. Equities serve as a hedge against inflation as they represent claims on real assets.

The relationship between gold prices and stock price

The relationship between gold prices and stock prices, however, were inconclusive. According to Smith, (2002) the short-run correlation between the gold price and stock price indices were frequently small and negative in European markets and also in Japan. The gold prices and stock price indices were also not co- integrated. This meant that there was no long-run equilibrium. These findings also in line with Buyuksalvarci (2010), who discovered that the price of gold had no significant effects on ISE-100 Index returns in Turkey. Mishra et. al. (2010), also proved that the Gold prices Granger-causes stock market returns and that stock market returns also Granger-causes the gold prices in India from January 1991 to December 2009. As a conclusion, the relationship between the gold price and stock market varies and depends on a country's economic situations.

The relationship between Stock price and oil price

Stock price and oil price relationships can exist either positively or negatively. Arouri & Julien (2009) and Hussin et. al.(2012b) found that the stock market in GCC and Malaysia countries reacted mostly positively to oil and price increases. Lin et. al. (2010) and Hussin et. al.(2012c) also proved that oil prices showed a positive relationship with stock returns in China and Islamic stock returns in Malaysia based on the positive expectation effect. Meanwhile, the studies of Gogineni (2007), and Yurtsever & Zahor (2007) also helped provide statistical support for a number of hypotheses. For example, the oil prices were positively associated with stock prices if oil price shocks reflected changes in aggregate demand, but they were negatively associated with stock price if they reflected changes in supply.

DATA AND ANALYSIS

This study applied time series analysis over a period of 10 years and uses monthly data for all the variables started from April 2007 to April 2016 (109 monthly observation). This secondary data sources are collected through DataStream and STATA software is used to conduct the analysis process in this study. All data are expressed in natural logarithm.

> Moreover, the study is conducted in the context of Malaysia which focus on FBMES used as a proxy for the Islamic stock market return and is considered as the dependent variable. Since there are various macroeconomic variables can be used to examine the impact of the stock market, therefore the choice of selected indicators is based upon the previous study which, some of the variables are insufficient been tested in this focus area. A total of seven macroeconomic variables have been chosen to be independent variables. The definitions of each variable and time- series transformation are described in Table 1.

This study adopted an Ordinary Least Square (OLS) model to examine the relationship between monetary, production and commodity variables on the Islamic stock market index in Malaysia. A Model developed and applied in this study is as follow:

$$FBMES_t = \alpha_0 + \alpha_1 M3_t + \alpha_2 KLIBOR_t + \alpha_3 EXRATE_t + \alpha_4 IPI_t + \alpha_5 CPI_t + \alpha_6 GOLD_t + \alpha_7 COP_t + \mu_t \quad (1)$$

This estimation model employed Ordinary Least Square (OLS) regression analysis as a multiple regression model which aims to identify the relationship between Islamic stock market, namely FBMES with seven macroeconomic variables which is actually the combination of three categories, i.e. monetary, production and commodity as independent variables. These selected variables are the Aggregate Money Supply (M3), Kuala Lumpur Interbank Offer Rate (KLIBOR), Exchange Rate of Malaysian Ringgit-United States Dollar (EXRATE), Industrial Production Index (IPI), Consumer Price Index (CPI), Gold Price (GOLD) and Crude Oil Price (COP).

In order to specify this regression model properly, we followed the several steps as a standard data analysis procedure of time series analysis. Firstly, this study applied descriptive statistic which allowed the researcher to examine the distribution (frequency distribution), central tendency (mean) and dispersion (standard deviation, minimum and maximum) of all variables. Secondly, this study need to identify the associate relationship between variables by using correlation coefficient analysis. Here, the strength of associate relationship among variables can be determined and high correlation causes a multicollinearity problem which refers to the value of coefficient between two explanatory variables that exceed value of 90%. Besides, it also supported by variance inflation factors (VIF) to show how much of the variance of a coefficient estimate of a regressor has been inflated due to collinearity with the other regressors. If this problem not properly been solved, it will give impact to regression analysis, which the expected value of beta become bias and inconsistent where the result of t-statistic no longer accurate. Thirdly, other diagnostic tests applied are include skewness and kurtosis coefficient for normal distribution of residuals, Breusch-Pagan/Cook-Weisberg and white test to observe heteroskedasticity problem, Durbin Watson d-statistic for checking of autocorrelation problem and Ramsey reset test used to identify omitted variable bias.

The first three tests measure the efficiency of error term, while the remainder including multicollinearity test are to measure the consistency of beta. Then finally, after all problems already been overcome, the ordinary least square regression analysis is performed to identify the existence and nature of causality relationship between the variables.

Acronym	Category	Variable	Description	Duration	Sources
FBMES	-	Natural logarithm of FTSE Bursa Malaysia Emas Shariah Index	FBMES used as the proxy for Islamic stock market in Malaysia.	Monthly data (April 2007 to April 2016)	DataStream (Thompson Reuters)
M3	Monetary	Natural logarithm of Aggregate Money Supply.	M3 used as to represent the money supply that includes M2 as well as large time deposits, institutional money market funds, short-term repurchase agreements and other larger liquid assets.	Monthly data (April 2007 to April 2016)	DataStream (Thompson Reuters)
KLIBOR		Natural logarithm of Kuala Lumpur Interbank Offering Rate	KLIBOR used as the proxy of interest rate in the Islamic Financial system in Malaysia.	Monthly data (April 2007 to April 2016)	DataStream (Thompson Reuters)
EXRATE		Natural logarithm of Exchange Rate	Foreign exchange rates of Ringgit Malaysia – United States Dollar (MYR) the used as for benchmark foreign exchange rate in Malaysia.	Monthly data (April 2007 to April 2016)	DataStream (Thompson Reuters)
IPI	Production	Natural logarithm of Industrial Production Index	IPI used as the proxy for Gross Domestic Product	Monthly data (April 2007 to April 2016)	DataStream (Thompson Reuters)

CPI		Natural logarithm of Consumer Production Index	CPI used as the proxy for the inflation rate in Malaysia	Monthly data (April 2007 to April 2016)	DataStream (Thompson Reuters)
GOLD	Commodity	Natural logarithm of Gold Price (MY Gold (U$) Currency)	GOLD used as the proxy for Malaysian gold price	Monthly data (April 2007 to April 2016)	DataStream (Thompson Reuters)
COP		Natural logarithm of Crude Oil Price	COP used as the proxy for world crude oil price.	Monthly data (April 2007 to April 2016)	DataStream (Thompson Reuters)

Table 1: Definition of Variables

Empirical Result

In this section, we will discuss on the findings and results obtained from the test. There are few parts divided in this section for an easier reference and understanding. Firstly, we will clarify the result achieved from descriptive statistic. Next part we will identify the associate relationship by denote a correlation between selected macroeconomic variables with FBMES (proxy for Islamic stock market). Then, we will explain about diagnostic test which measure a consistency (i.e. multicollinearity and omitted variable test) and an efficiency (i.e. normality, heteroskedasticity and autocorrelation test) that involve estimation of beta and standard error of beta respectively. Lastly, we will reveal the findings gained from the empirical model which is multiple regression model and justify the result by support with other researchers in previous study.

Descriptive Statistic

As a pre-requisite for establishing the presence of relationship among the variables, we first implement the descriptive statistic as to help in describe and understand the features of a specific data set, by giving short summaries about the sample and measures of the data. Table 2 displays the descriptive statistics of monthly value of FBMES, M3, KLIBOR, EXRATE, IPI, CPI, GOLD and COP from April 2007 to April 2016. The total number of observations included in the period is 109 observations.

Variable	Observation	Mean	Std. Dev.
FBMES	109	10420.56	2027.375
M3	109	1203872	265647.2

KLIBOR	109	3.09211	.4437218
EXRATE	109	3.350065	.3148711
IPI	109	107.3211	9.060181
CPI	109	103.5725	6.282794
GOLD	109	1233.801	591.5811
COP	109	92.39229	27.66335

Table 2: The Descriptive Statistic

The mean for FBMES is about 10420.56 while for M3 is 1203872. On the other hand, the average for KLIBOR and EXRATE are 3.09211 and 3.350065 respectively. Meanwhile, for IPI and CPI, the mean is 107.3211 and 103.5725 which the amount is quite near to each other. Lastly, the mean for commodity which include GOLD and COP individually are 1233.801 and 92.39229. The table shows that the highest standard deviation is M3 which also means it has widest spread of distribution within data set.

Correlation Coefficients

The table 3 below show the result of correlation matrix for all variables in the model. Numbers are Pearson correlation coefficients, go from -1 to 1. Closer to 1 means strong correlation. A negative value indicates an inverse relationship between two variables.

The value of correlation coefficient is range between -0.0319 to 0.9746. The correlation matrix between independent variables are essential to be examines as it will give symptoms of multicollinearity exist. On the other hand, in order to examine the associate relationship between independent variables and dependent variables. The result indicates that there is high correlation between LM3, LIPI and LCPI with LFBMES. On the other hand, there is a moderate association relationship for LKLIBOR and LGOLD with LFBMES during period from April 2007 to April 2016.

	LFBMES	LM3	LKLIBOR	LEXRATE	LIPI	LCPI	LGOLD	LCOP
LFBMES	1.0000							
LM3	0.8065*	1.0000						
LKLIBOR	0.4083*	0.1896*	1.0000					
LEXRATE	-0.0345	0.1317	0.0319	1.0000				
LIPI	0.8050*	0.7400*	0.5312*	0.3177*	1.0000			

LCPI	0.7253*	0.9746*	0.2134*	0.2470*	0.7502*	1.0000	
LGOLD	0.6325*	0.7702*	-0.1317	-0.2637*	0.3544*	0.6964*	1.0000
LCOP	0.1662	-0.0757	0.0928	-0.8906*	-0.1417	-0.1779*	0.2063	1.0000

Bold: Correlation is significant at the 0.05 level (2-tailed).

Table 3: Correlation Matrix

Diagnostic Test

There are two tests applied under diagnostic test which are coefficient and residual diagnostic. The former test involves the special case of tests for omitted variable and collinearity level between two variables including VIF. This diagnostic provides information and evaluate restrictions on the estimated coefficients. Meanwhile, the latter provides tests for normality, heteroskedasticity and autocorrelation in the residuals from the estimated equation.

Multicollinearity Test

Multicollinearity is a condition where independent variables are strongly correlated with each other. As refer to the rule of thumb, multicollinearity exist if there is correlation coefficient of 0.9 or higher than 0.9. Meanwhile, Kennedy (2008) states that multicollinearity is a problem when the correlation coefficient is above 0.70. In this study, we refer to the rule of thumb as our reference to identify the issue of multicollinearity. When multicollinearity exists in a model, the standard error will become very high and will make t statistics low in value. Besides, it also will cause an inconsistency and unexpected changes in coefficient magnitudes or signs, or non-significant coefficients despite a high R-square. Therefore, the primary concern is that as the degree of multicollinearity increases, the regression model estimates of the coefficients become unstable and the standard errors for the coefficients can get wildly inflated.

As we can see in Table 3 above, there is a multicollinearity exist since high correlation between LM3 and LCPI which indicate more than 90% rule of thumb. The equivalent signs of multicollinearity problem also can be looked by using a regress postestimation command, estat VIF (refer Table 4). As a rule of thumb, a variable whose VIF values are greater than 10 may merit further investigation. Regarding on this table, here the VIF and tolerance (1/VIF) values for LM3 and LCPI are worrisome. The very high VIF values indicate that these variables are possibly redundant and measure the same thing.

With Multicollinearity Problem			Without Multicollinearity Problem		
Variable	VIF	1/VIF	Variable	VIF	1/VIF
LM3	35.66	0.028046	LEXRATE	8.01	0.124908
LCPI	28.92	0.034576	LCPI	5.88	0.170020

LEXRATE	8.19	0.122031	LCOP	5.85	0.170970
LCOP	5.85	0.170873	LGOLD	4.56	0.219174
LGOLD	5.35	0.186836	LIPI	4.05	0.247017
LIPI	4.54	0.220329	LKLIBOR	2.06	0.486511
LKLIBOR	2.07	0.482668			
MEAN VIF	12.94		MEAN VIF	5.07	

Table 4: Estimation of VIF

To overcome this problem, we omitted one of the variables, LM3 as this variable was also highly correlated with some other key variables. Note that the VIF values in the table 4 above appear much better and thus it free from multicollinearity problem. We need to drop LM3 due to it may be more of an issue when there are two supposedly different but very closely related variables are included and will show the conditions described earlier.

Normality Test

The presence of any severe outliers should be sufficient evidence to reject normality at a 5% significance level. Mild outliers are common in samples of any size. Table 5 reveals the normality test of residual for three situations.

Residuals			
Skewness	-.0083869	-.3724569	.0840092
Kurtosis	2.218723	2.913356	2.718499
Pr(Skewness)	0.9698	0.1043	0.7095
Pr(Kurtosis)	0.0144	0.9139	0.6848

Table 5: Normality Test

In this study, for the first data been generated, there is a strong deviation from normality as the value of kurtosis is not close to 3 and p-value is less than 0.05. However, on the basis of skewness alone, this study cannot reject that the residual is normally distributed. As to make residual normally distribute, 2 outliers were dropped in order to tackle the problem. Thus, by referring to column two, this study failed to reject the normality distribution of residual. The skewness is close to 0 and kurtosis is close to 3, while their p-value more than 0.05. It means that the normal distribution is symmetric and has a bell-shaped with a peakedness and tail-thickness. The last column is subject to the analysis of skewness and kurtosis test after applying and creating lag of dependent variable, run a robustness test and drop 1 outlier. The skewness and kurtosis value indicates that the distribution seems fairly symmetric and the residuals have an approximately normal distribution.

Heteroskedasticity Test

Heteroskedasticity means the variance of the error term is not constant. Supposedly, we need to acquire constant in variance of error terms as to get an accurate in test statistic and confidence interval. If the heteroskedasticity is present, the standard errors become biased and chi-square become larger in value, in other way OLS (Ordinary Least Square) estimates are no longer BLUE (Best Linear Unbiased Estimate). In order to test for heteroskedasticity, we will utilize Breusch-Pagan / Cook-Weisberg and White's test (Lagrange Multiplier (LM) test). As displays in Table 6, based on the chi-square statistic, both tests have p-value less than 10% and chi-square value was large, we conclude that there is substantial amount of heteroskedasticity in the model and we reject the null hypothesis of homoscedasticity in favor of heteroscedasticity.

Breusch-Pagan / Cook-Weisberg test	White's test (Lagrange Multiplier (LM) test)
Ho: Constant variance	Ho: homoscedasticity
Variables: fitted values of LFBMES	Ha: unrestricted heteroskedasticity
chi2(1) = 3.11	chi2(27) = 69.06
Prob > chi2 = 0.0779	Prob > chi2 = 0.0000

Table 6: Heteroskedasticity Test

As noted above, heteroskedasticity causes standard errors to be biased. To overcome this problem, the robust standard errors was applied as robust standard errors are more appropriate and easiest way to be implemented. This yields heteroskedasticity corrected with robust standard errors.

Autocorrelation Test

Autocorrelation is defined as correlation between the observations of residuals. It can be caused by a missing variable, an incorrect functional form, or the pure autocorrelation that frequently arises in time series data. In our study, we used the Durbin–Watson test to determine whether the error term in a linear regression model follows an AR (1) process. Durbin–Watson statistic is a test statistic used to detect the presence of autocorrelation in the residuals (prediction errors) from a regression analysis.The model assumed to be free from the autocorrelation if Durbin -Watson value is around 2 (1.5 < Durbin Watson Value < 2.5). Thus, as refer to column 1 in Table 7 below, the result shows there is autocorrelation problem where such error terms are said to be autocorrelated which means the error terms are correlated with each other (today's error term correlate with error term in a day before).

Before lagged dependent variable	After lagged dependent variable
Durbin-Watson d-statistic (7, 107) =.9963339	Durbin-Watson d-statistic (8, 106) =2.139857

Table 7: Autocorrelation Test

There are several approaches to resolving problems of autocorrelation. In this study, we applied the lagged dependent variables. Therefore, the new result after we included lagged dependent variable (FBMES) in regression analysis is it free from autocorrelation problem.

Omitted Variables Test

The ovtest command performs another test of regression model specification. It performs a regression specification error test (RESET) for omitted variables. Regarding on our result in table 8, here we failed to reject null hypothesis and the model has no omitted variables.

Ho: model has no omitted variables	
F(3, 95)	0.85
Prob > F	0.4679

Table 8: Reset Test Misspecification

The model does not have possible missing variables at the 10% level (given that p > .10). The RESET test suggests no evidence of functional form misspecification and indicates that our model most likely not suffers from endogeneity that causing biased coefficient estimates, therefore, we can apply our model to this study.

Multiple Regression

The least square estimator can be used to estimate the linear model even when the errors are not homoscedasticity. Since heteroskedasticity presence in our model, therefore we are rerunning the earlier regression (refer Table 9) with robust option (Table 10). The robust standard errors will address the problem of errors that are not independent and identically distributed. By referring to both tables, after we re-estimate the model using robust standard error, notice that the regression result shows the coefficient estimates provided by OLS are not change, but the standard errors and significance tests will be different. This leads to different in t-ratios and confidence intervals. Hence, when heteroskedasticity is present, robust standard errors tend to be more reliable. The robust standard errors can usually be computed via the addition of two parameters, robust and cluster. The robust option relaxes the assumption that the errors are identically distributed, while cluster relaxes the assumption that the error terms are independent of each other.

In order to answer our objective of this study, we will use the regression with robust standard error as our model to explain the result. Before we discuss the finding of the estimation result, we will explain the F-statistic and R2 (R-squared) of this study. The F-statistic of this model is statistically significant at 1% level when its value exceeds F-critical, thus the null hypothesis has been rejected. The result show that at least one of the independent variables used in the study has significant effect to the FBMES. Meanwhile the R2 reveals that about 95.85% of variation in FBMES is explained by the variation of explanatory variables. The remaining 4.15% of variation in FBMES is explained by other variables that are omitted in the model.

LFBMES	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
LKLIBOR	.0057015	.0403671	0.14	0.888	-.0744057	.0858086
LEXRATE	.5259805	.1389551	3.79	0.000	.2502286	.8017324
LIPI	.2053385	.1394195	1.47	0.144	-.0713351	.482012
LCPI	-.9495413	.1795806	-5.29	0.000	-1.305913	-
LGOLD	.0776224	.013418	5.78	0.000	.0509948	.1042499
LCOP	.0971621	.0304205	3.19	0.002	.0367936	.1575307
FBMES_01	.0000971	5.93e-06	16.36	0.000	.0000853	.0001088
_cons	10.05514	.8286151	12.13	0.000	8.410782	11.6995
Number of obs	106					
F(7, 98)	323.60					
Prob > F	0.0000					
R-squared	0.9585					
Adj R-squared	0.9556					
Root MSE	.04482					

Table 9: Ordinary Least Square Regression Result

Based on the coefficient estimates in Table 10 below, the dynamic model is created and the equation of regression (all variables are in natural logarithm value) is stated as follows:

$$FBMES = 10.06 + 0.006KLIBOR + 0.526EXRATE + 0.205IPI - 0.950CPI + 0.078GOLD + 0.097COP + 0.0000971\,FBMES_{t-1} + \mu_t$$

The p-value of KLIBOR is 0.895 which means that there is a positive effect of KLIBOR to the FBMES, but the result is not statistically significant to explain the variations in FBMES. This result is line with Majid and Yusof (2009)

where there is a convincing evidence that interest rate did not connect well with the Islamic stock market volatility.

LFBMES	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
LKLIBOR	.0057015	.0432317	0.13	0.895	-.0800904	.0914933
LEXRATE	.5259805	.1194061	4.40	0.000	.289023	.7629381
LIPI	.2053385	.1142986	1.80	0.075	-.0214833	.4321603
LCPI	-.9495413	.2111646	-4.50	0.000	-1.368591	-.5304921
LGOLD	.0776224	.0153096	5.07	0.000	.047241	.1080038
LCOP	.0971621	.0281205	3.46	0.001	. .0413579	.1529664
FBMES_01	.0000971	8.69e-06	11.17	0.000	.0000798	.0001143
_cons	10.05514	1.112733	9.04	0.000	7.846959	12.26332
Number of obs	106					
F(7, 98)	439.13					
Prob > F	0.0000					
R-squared	0.9585					
Root MSE	.04482					

Table 10: Regression with Robust Standard Errors Result

On the other hand, there is a positive and significant impact of EXRATE on the FBMES as the p-value is 0.000 which statistically significant at 1% level. This means for every 1% percent increase in EXRATE, we will see a 0.526% increase in FBMES. Our study is consistent with Jamaludin, Ismail, & Manaf, (2017), Abd Majid & Yusof, (2009) and Mookerjee and Yu (1997), as they mentioned in their study, the Islamic stock market share significant positive relationship with EXRATE. This result is in contrast to Vejzagic and Zarafat (2013) and M. Y. Hussin et al., (2012a), who found a negative relationship.

Besides, the IPI that represent the GDP indicate that there is a significantly positive influence of IPI on the FBMES. The p-value is 0.075, which means that it statistically significant at 10% level. Thus, it provides an evidence that 1% increase in IPI caused the FBMES increased in 0.205%. Our result is not contradicted with M. Y. Hussin et al., (2012a), as they mentioned in their study, the KLSI share significant positive relationship with IPI. This result also in line with the share analysis theory based on the discounted cash flow model which states that the IPI shares a positive correlation with a particular firm expected future cash flow. This means that the higher the IPI, the higher the expected share price.

The null hypothesis of CPI has been rejected because the coefficient βCPI, FBMES is significant at 99% level of confident. The result means that the CPI has significant negative effect on the FBMES. This means, an increase in CPI for every 1%, will decrease in 0.950% of the FBMES. The result is similar with Talla (2013), Fama and Steward (1977) and DeFina (1991).

Meanwhile, the empirical result shows that there is a positive significant effect of GOLD on the FBMES. The p-value of GOLD is 0.000, which means it

statistically significant at 1% level. Therefore, an increase in 1% of GOLD, will make FBMES increase in 0.078%. This result also equivalent with (Chong, 2013), where in his study, the gold has significant impact. However, our study contradict with M. Hussin et al., (2013), whereby FBMES was not affected by gold prices and the relationship between gold prices and stock prices, however, were still unconvincing.

Finally, there is a positive and significant impact of COP on FBMES as its p-value is 0.000 which is significant at 1% level. Therefore, increase in 1% of COP will make increase in FBMES about 0.097%. The finding is consistent with studies by Mohd Hussin, Muhammad, Abdul Razak, & Abu, 2012b), Sadorsky (2001), Arouri and Julien (2009) and Lin et al. (2010) in the case of Malaysia, USA, GCC countries and China respectively. Last but not least, the lagged dependent variable (FBMESt-1) need to be added in our model since we suffered from autocorrelation problem. The past lag of FBMES also positively influences the FBMES which according to Rashid et al., (2014) , it is quite common in time series modelling. Thus, by create a lag, the error terms will be captured by beta of FBMESt-1, then this error terms became white noise.

CONCLUSION

The study empirically assesses the relationship between the macroeconomic variables and stock market behavior in Malaysia during 2007 until 2016. Based on the analysis, the inclusion of KLIBOR, EXRATE, IPI, CPI, GOLD and COP enhance the predictability measure of the Malaysian Islamic stock market. From the analysis above, it can be concluded that the Islamic stock market (FBMES) share a positive and significant relationship with the Foreign Exchange Rate (EXRATE), Industrial Production Index (IPI), Gold Price (GOLD) and Crude Oil Price (COP). On the other hand, it has negative relationship and significant influence with Consumer Price Index (CPI). Then, among other variables which are marked as statistically significant, it has a negative and not significant relationship with Kuala Lumpur Interbank Offering Rate (KLIBOR) and can be concluded that KLIBOR is not a valid variable for the purpose of predicting changes in Islamic stock market (FBMES). It is recommended that for future research, it is more appropriate to substitute KLIBOR and proxies by Treasury Bill Rate (TBR) as this indicator seem to have positive relation with the stock market indexes (Abd Majid & Yusof, 2009). Other than that, incorporating longer sample period, covering more Islamic stock markets worldwide and including other macroeconomic variables that may potentially affect Islamic stock market might enhance further analysis and implications of the study in this issue.

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