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Macroeconomic Indicators and Saudi Equity Market: A Time Series Analysis

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Abstract

Finance theories assert that macroeconomic factors play a significant role in determining the strength of economic situations. As such, the influence of macroeconomic variables must be realised. This study explored the association between macroeconomic variables and stock return. The methodological research employed two econometric models. These included the Ordinary Least Squared (OLS) and the Granger Causality Model. This research concentrated on the Saudi stock market, using data from January 2010 to December 2014 in order to explore the effect of macroeconomic variables on stock returns based on inflation, money supply, interest rate and oil price. The results indicated that there was a positive and significant relationship between oil price and stock returns. Furthermore, the results highlighted a negative relationship between inflation rates and stock returns. The overall Granger Causality Test revealed that stock returns influenced interest rates. The results support and reinforced a growing body of knowledge and published literature asserting that stock returns Granger influenced the price of oil, consequently, highlighting the effects of interest rates on stock returns. However, stock prices did not influence additional macroeconomic variables included in the research.

Keywords: Granger Causality, Macroeconomics Variables, Saudi Equity Market

Introduction

Financial markets play an important role in determining the strength or weakness of the economic situation in any countries by transferring the investment funds from surplus to deficit economic units (Mutuku & Ngeny; 2014). The stock markets play an important role for the real economy, and it can be considered as a leading economic confidence indicator that can point the trends of the real economy (Constantinescu, 2012). Nonetheless, stock market history is scattered with events whose level of drama seems to defy explanation. They are striking enough to earn names of their own: The Great Crash of 1929, Tronics Boom and Go-Go years of the 1960s, The Nifty-Fifty bubble of the 1970s, Black Monday Crash of October 1987, the Dot.com bubble of the 1990s, 1997's East Asian financial crisis, the global financial crisis of 2008 and the recent Chinese financial crisis 2015 (Almansour, 2015).

History has shown that economic downturns, financial crises, political turmoil, and other social factors have caused the stock markets around the world to be unstable and highly volatile for investors (Guiso, Sapienza, & Zingales, 2008; Almansour, 2015). Several factors can be considered as indicators to the participants whose in the stock markets in the direction of forecasting a higher or lower return when investing in stocks. Macroeconomic variables consider one of these factors that can significantly affect the stock return (Almansour, 2015). The association among macroeconomic variables and stock return

has been explored in emerging financial markets over the past decades (Geetha, Mohidin, Chandran and Chong, 2011; Anlas, 2012; Sarbapriya, 2012; Samontaray, Nugali and Sasidhar, 2014). Nonetheless, any changes in the situation of the economy could significantly affect the investors' decision toward investing in financial markets.

Recently, the kingdom of Saudi Arabia may face another financial crisis after its underestimated gamble on oil. This leads the investors to be away of investing their money on the financial markets, and this will affect the performance of the Saudi Stock exchange due to the lack of investing. Chun and Ming (2007) provided evidences that the investment decision made by investors in the equity markets is influenced to several macroeconomic factors. This supports the important role of macroeconomic factors in equity market and shows that the relationship between macroeconomic factors and stock return is exist.

The Saudi Stock Exchange is known as Tadawl has been opened to qualified domestic and foreign investors. The Saudi stock exchange is the biggest and most liquid in the entire Middle East and North Africa. In term of market capitalization, the Saudi stock exchange records a value of US\$590 billion. From a regional perspective, as at the end of 2013, the Saudi equity market also represents over 50% of the entire GCC equity market capitalization, and accounts for 75% of the value traded (SAMA, 2014). Nonetheless, the association that the stock market of Saudi Arabia, an emerging market, is inefficient and possibly irrational, cannot be made without a careful and comprehensive study on impact of the macroeconomic factors on financial stock market in the kingdom of Saudi Arabia.

Several studies on the association between macroeconomic variables and stock returns were investigated in developed financial markets such as Fama (1990), Chen, Roll & Ross (1986), Sariannidis, Giannarakis, Litinas and Konteos (2010), and Lakshmi & Tuwajri, (2014). Likewise, the influence of macroeconomic variables on stock returns has been conducted in developing economics such as Rahman, Tafri & Sidek (2009), Geetha, Mohidin, and Chandran Chong (2011), Anlas (2012), Sarbapriya (2012) and Samontaray, Nugali and Sasidhar (2014).

In this regard, Samontaray *et al.* (2014) conducted a study on the effect of macroeconomic variables on stock returns in Saudi stock exchange, the authors used two macroeconomic variables namely, OIL WTI and Saudi Export. Thus, this study attempts to examine the connection between several macroeconomic variables and stock returns based on a set of macroeconomic variables namely, inflation, money supply, interest rate and oil price.

Literature Review

The relationship between macroeconomic variables and stock returns has been studied since the last decade in several researches. These studies were conducted on both developed as well as emerging financial markets. Theories and previous studies documented that there is a strong association between macroeconomic variables and stock return in both developed and developing financial markets (Rahman, Tafri & Sidek, 2009; Geetha, Mohidin, & Chandran Chong, 2011; Anlas, 2012; Sarbapriya, 2012; and Samontaray, Nugali & Sasidhar, 2014).

Back to the 1976, one of the earliest studies on the association between macroeconomic variables and stock return is by Nelson. He provided an assessment of monthly stock market returns and inflation in the US financial market for the period of 1953 to 1974, based on his results, he found that there is a negative linked between inflation rate and stock returns. Moreover, Stavarek (2005) studied the

relationship between effective exchange rates and stock returns in Australia, France, Germany, the UK, Czech Republic, Hungary, Poland, and Slovakia. Based on the statistical tool of Granger causality test, a strong causality association in countries with developed capital and foreign exchange markets was found.

However, Bhattacharya and Mukherjee (2003) investigated the relationship between macroeconomic variables on stock returns in Indian stock market. They used three macroeconomic variables as determinants of stock return; these variables were exchange rate, foreign exchange reserves and trade balance. Granger causality test was employed to explore the relationships between the macroeconomic variables and Indian stock returns by using monthly data from 1990 to 2000. They concluded that there is no significant relationship between the macroeconomic variables and stock return in Indian financial market. However, Sarbapriya (2012) conducted a research on the connection between foreign exchange reserves and stock market capitalization in India. He used a simple linear regression model and Granger causality test. The results showed that the causality is unidirectional and it runs from foreign exchange reserve to stock market capitalization and that foreign exchange reserves have a positive impact on stock market capitalization in India.

In Ghana, the association between macroeconomic factors and economic growth and stock market performance was investigated by Kyereboah-Coleman & Agyire-Tettey (2008). By using quarterly data for the variables from 1991 to 2005, the macroeconomic factors were interest rate, real exchange rate, inflation and treasury bill. Based on the regression analysis, it was revealed that the inflation rate as well as lending rate was negatively affecting stock market performance. But, the exchange rate has a positive impact on the stock market performance

Doong, Yang, and Wang (2005) conducted a study on the relationship between stock returns and exchange rates using the Granger causality test in six Asian countries namely, Thailand, India, Korea, Taiwan Indonesia and Malaysia. Based on their results, they revealed that a negative and significant association between exchange rate and stock returns was found for all the included countries except Thailand. Furthermore, Pan Fok and Liu (2007) also explored the association between macroeconomic variables and stock returns for seven East Asian countries over the period 1988 to 1998. These countries are Hong Kong, Japan, Malaysia, Thailand, Korea and Singapore. Based on Granger causality tests, it was found that during the Asian financial crises, a causal association between exchange rates and stock returns was detected for all countries except Malaysia.

In Pakistan context, Rashid (2008) studied the dynamic association between macroeconomic factors and stock returns. The macroeconomic factors were industrial production, interest rate, consumer prices index and exchange rate. By employing Granger causality and co-integration tests, it was found that there is a bi-directional relationship between macroeconomic factors and stock returns except consumer prices which is the only macroeconomic variables that leads to stock returns.

Additionally, the interactions between economic variables and stock prices have been investigated by Mahmood and Dinniah (2009) in six Asian-Pacific selected countries namely, Malaysia, Korea, Thailand, Hong Kong, Japan, and Australia. They used monthly data on stock price indices and foreign exchange rates. They found that long run equilibrium and short run multivariate causality between these variables.

Geetha, Mohidin, Chandran and Chong (2011) explored the interactions between stock markets, expected inflation rate, unexpected inflation rate, exchange rate, interest rate and GDP in Malaysia, the US and China. Their data was divided into two divisions, the long-run relationship between the variables as well as the short-run relationship between the variables. They found that there is a long run relationship between stock markets and macroeconomic variables in Malaysia, US and China. Furthermore, they revealed that there is no short-run relationship between the stock market, unexpected inflation, expected inflation, interest rate, exchange rate and GDP for Malaysia and US. However, the results also showed that there is short-run relationship between the inflation rates and stock market in China.

Similarly, Asaolu and Ogunmuyiwa (2011) studied the effect of macroeconomic variables on stock returns in Nigeria over the period of 1986 to 2007. They employed statistical tools to test the relationship between the variables namely, Augmented Dickey-Fuller (ADF) test, Johansen Co-integration procedure, Granger Causality test and Error Correction model (ECM). The macroeconomic variables used in their study were foreign capital inflow, inflation rate, external debt, industrial output, exchange rate, fiscal deficit and investment. Based on their results, it is concluded that the stock returns does not Granger cause any of the macroeconomic variables with exclusion to exchange rate that does Granger cause stock returns. Moreover, the results showed that there is a long term association between the macroeconomic variables used and stock returns.

Furthermore, Adaramola (2011) explored the influence of broad money, interest rates, exchange rates, the inflation rate, oil price, and gross domestic product on stock returns in Nigeria by employing a quarterly data ranged from 1985 to 2009. The results showed that the macroeconomic indicators have a significant influence on stock return with exception to two macroeconomic indicators namely, inflation and money supply which has been found to have insignificant influence on stock returns.

Another study by Anayochukwu (2012) who explored the impact of macroeconomic variables and stock returns in Nigeria. Granger causality test and multiple linear regression analysis were used, the results showed that foreign portfolio investment is positively related to stock returns whereas the inflation rate is observed to have a positive relationship with stock return but not significant. Moreover, the results revealed that there is a unidirectional causality running from stock returns to foreign portfolio investment in the economy, which.

Hussain *et al.*, (2012) investigate the impact of macroeconomic variables on stock returns by using monthly data sorted from 2001 to 2010. The macroeconomic variables selected were exchange rate, foreign exchange reserve, industrial production index, interest rate, import, money supply, wholesale price index and export. The results showed that the foreign exchange reserve, interest rate, import and wholesale price index were positively and significantly related to stock return. Furthermore, the results showed that the exchange rate and the export were negatively and significantly related to stock return.

Moreover, Gay (2008) examines the connection between stock market index price and the macroeconomic variables in Brazil, Russia, India, and China. The macroeconomic variables selected in his paper are exchange rate and oil price; He concluded that there is no significant connection between exchange rate and oil price on the stock market index prices in the selected developing countries.

Likewise, Mohammad (2011) conducted a research on the effect of microeconomic and macroeconomic variables on stock returns in Bangladesh. He collected monthly data for each variable for

the period of July 2002 to December 2009. Based on his analysis, the results showed that there is a negative connection between stock returns and inflation as well as foreign remittance. However, market Price/Earnings and growth in market capitalization have a positive effect on stock returns.

Samontaray *et al.* (2014) studied the impact of different macroeconomic variables on the returns of the Saudi stock market. The macroeconomic variables used in their study are the Oil WTI, Saudi Exports and the PE Ratio for the period of December 2003 to December 2013 using a monthly data. Step-wise regression analysis was used and the results showed that PE Ratio was the most important determinant of Tadawl stock exchange index (TASI) followed by Oil WTI and Saudi Exports. Moreover, the three macroeconomic variables have been explained to be about 93% of variation in the TASI Last Price.

Acikalin, Aktas and Unal (2008) explored the association between stocks return in the Istanbul Stock Exchange (ISE) and the macroeconomic variables of the Turkish economy. They took the quarterly data sets and applied the cointegration tests and vector error correlation method (VECM). Based on the technique used, the result showed that long term stable relationship between ISE and four macroeconomic variables such as GDP, exchange rate, interest rate, and current account balance by applying the causality tests, they found unidirectional relationships between macro indicators and ISE index. Furthermore, Anlas (2012) investigated the impact of changes in foreign exchange rates on Istanbul Stock Exchange Composite Index (ISE). He collected a monthly data for a period of January 1999 to November 2011. He applied the time series analysis method, and based on this technique the results showed that changes in domestic U.S. Dollar and Canadian dollar are positively related to changes in ISE 100 while fluctuations in domestic interest rates and Saudi Arabia Riyal have a negative impact on the index.

Hunjra, et, al (2014) studied the impact of Macroeconomic indicators on stock returns in Pakistan over the period 2001 to 2011. By applying Cointegration and Granger causality test, the results showed that there is no linkage between macroeconomic variables and stock returns in the short run. In another side, the results revealed that there is a string relationship macroeconomic variables and stock returns in long run.

The review of past documented literature on the relationship between macroeconomic variables and stock return show that there are inconsistency results in the effect of macroeconomic variables on stock returns in both developed as well as emerging financial markets. This could be due to the global financial crisis happened in 2009 and other factors. Hence, it is important to conduct this study in Saudi aspect because of the strength of its economic situation among other golf countries as well as its financial market.

Methodology

Data sources

The database used in this study consists of monthly stock returns of the Saudi stock index "TASI" collected from the stock exchange of Sudi (Tadawl) for the period January 2010 to December 2014. The macroeconomic variables are also collected in monthly basis from the website of the Saudi central bank. The data is ranged from 2010 to 2014 to avoid the effect of global financial crisis on the Saudi equity market's performance.

The Research Design

The main objective of this research is to explore the linkage between macroeconomic variables and stock returns in the Saudi equity market. The dependent variable in this study is the stock returns, the financial market's performance can be measured by the market index which provides historical information to investors so that gives them an ability to predict the future stocks prices movements in the market (Naik & Phadi, 2012).

The independent variables are inflation, money supply, oil price and interest rate. The selected macroeconomic variables have been governed by the time series that are most frequently used in the previous studies for predicting stock returns. Therefore the research design is as follows:

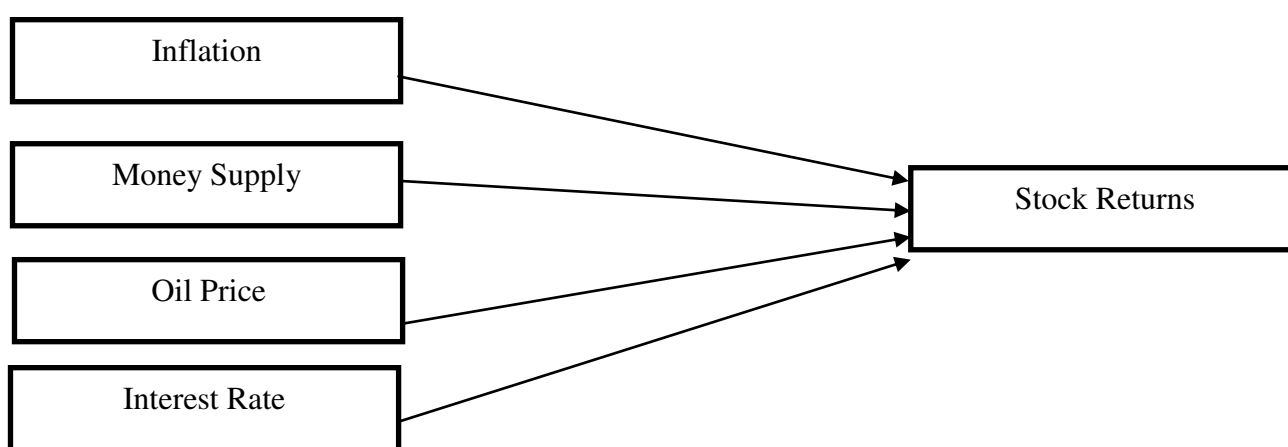


Figure 1: Research Framework of the Relationship between Macroeconomic Variables and Stock Returns

The Model

The aim of this paper is to investigate the relationship between macroeconomic variables and stock returns in Saudi equity market. There are two econometric models employed in this study, the first model is Ordinary Least Squared (OLS) which is aimed to examine the association between the macroeconomic variables and the stock return. The second model is Granger Causality, this model is aimed to test the bidirectional linkage between individual explanatory variables and stock return.

In order to employ statistical tools for time series data, it is necessary to consider the problem of spurious regression if the data is non-stationary. Hence, to keep away this kind of problem, the unit root test (Augmented Dickey –Fuller test) is employed first to make sure that if the time series data is stationary. Furthermore, if the results of the unit root test illustrates that the data is non-stationary, the first difference of the variables shall be employed before conducting the OLS method and the Granger Causality Test. Moreover, if the results of the unit root test for the first difference showed that the data is non-stationary, then the second difference of the variables will be employed before conducting the OLS method and the Granger Causality Test. The general Ordinary Least Squared (OLS) equation is as follows:

$$SR_i = \beta_0 + \beta_1 INF_{1i} + \beta_2 MS_{1i} + \beta_3 OP_{1i} + \beta_4 INT_{1i} + \varepsilon_i \dots\dots\dots(1)$$

Where,

- SR: Stock Return
- INF: Inflation
- MS: Money Supply
- OP: Oil Price
- Int: Interest Rate
- e : Error
- B0 Constant

Empirical Results

The data used in this research is time series data, table 1 provides the summary of the descriptive statistics for the underlying macroeconomic indicators that are used for predicting stock returns. The table shows the values of the minimum, maximum, mean, and standard deviation of the variables.

Table 1: Descriptive Statistics for the Dependent and Independent Variables

Variables	Obs.	Mean	Median	Maximum	Minimum	Std. Dev.
Stock Return	60	0.000574	0.001335	0.011444	-0.01643	0.005381
Inflation Rate	60	4.255	4.4	6.1	2.5	1.08946
Interest Rate	60	0.851404	0.901875	0.995	0.6	0.120006
Money Supply	60	11.565	12.3	17.2	2.9	3.135084
Oil Price	60	4.615758	4.691164	4.849605	4.015842	0.172494

Whilst the above information is self-explainable, it is important to highlight some of the similarities and differences of the data. For instance, the range of stock returns is between -0.011444 to 0.01643. The mean value for the stock returns is 0.000574 with a value of standard deviation of 0.005381. Furthermore, the range of inflation rate is between 2.5 to 6.1. The mean value for the inflation rate is 4.255 with a value of standard deviation of 1.08946. For the interest rate, the mean value is recorded as 0.851404 with a value of standard deviation of 0.12, the range of interest rate is between 0.6 to 0.995. For the money supply, the mean value is recorded as 11.565 with a value of standard deviation of 3.135, the range of interest rate is between 2.9 to 17.2. The range of oil price is ranged between 4.015842 to 4.849605. The mean value for the oil price is 4.615758 with a value of standard deviation of 0.172494.

The data of this research is time series data. Thus, it is essential to observe the existence of unit root in the data series. A non-stationary variables lead to the problem of spurious regression between unconnected variables. It is important to deal with stationary data before employing linear regression and Granger causality test. The most accepted statistical technique of unit root tests is the Augmented Dickey-Fuller (ADF) test. The results of ADF is illustrated in table 2

Table 2: ADF Test Result at Level, Trend, Intercept

Null Hypothesis	P- Value	Null Hypothesis	Results
SR is not stationary	0.0000 < 0.05	Reject	SR is stationary
OP is not stationary	0.8389 > 0.05	Do not reject	OP is not stationary
Int is not stationary	0.2215 > 0.05	Do not reject	Int is not stationary
Inf is not stationary	0.9488 > 0.05	Do not reject	Inf is not stationary
MS is not stationary	0.0164 < 0.05	Reject	MS is stationary

The results in Table 2 show that the p-values for oil price, interest rate and inflation are greater than the 5% significant level. As a result, the null hypothesis cannot be rejected. In other words, the results concluded that three variables out of five namely oil price, interest rate and inflation are non stationary, meaning that those variables follow a random walk with drift and no time trend. This involves and leads to employ the first difference of those variables before the regression model is employed. However, the other two variables money supply and stock returns were shown to be stationary variables since the p-values for them are less than 5% significant level. Table 3 shows the ADF test result at first difference

Table 3: ADF Test Result at First Difference

Null Hypothesis	P- Value	Null Hypothesis	Results
OP is not stationary	0.0009 < 0.05	Reject	OP is stationary
Int is not stationary	0.0258 < 0.05	Reject	Int is stationary
Inf is not stationary	0.0000 < 0.05	Reject	Inf is stationary

The results of ADF test at first difference are shown in Table 3. The results show that the p-values for oil price, interest rate and inflation are less than the critical value (5%). As a result, the null hypothesis can be rejected. In other words, the results concluded that those three variables namely oil price, interest rate and inflation are stationary when the first difference is employed for the three variables. Therefore, the Ordinary Least Squared (OLS) equation is reformulated as follows:

$$SR_i = \beta_0 + \beta_1 DINF_{1i} + \beta_1 MS_{1i} + \beta_1 DOP_{1i} + \beta_1 DINT_{1i} + \varepsilon_i \dots\dots\dots(2)$$

Where,

- SR: Stock Return
- DINF: Inflation at the first difference
- MS: Money Supply
- DOP: Oil Price at the first difference
- DInt: Interest Rate at the first difference
- e: Error
- B0 Constant

The Relationship between Macroeconomic Variables and Stock Return

In order to investigate the relationship between macro and stock return, the statistical tool of ordinary least squared is adopted. The results of the ordinary least squared are presented in details in table 4.

Table 4: The Relationship between Macroeconomic Variables and Stock Return

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF)	-0.001165	0.002944	-0.395901	0.6937
D(INT)	0.036019	0.02828	1.27365	0.2082
MS	0.0000431	0.000238	0.180762	0.8572
D(OP)	0.03104	0.009092	3.41397	0.0012
C	0.000111	0.002839	0.039021	0.969
R-squared	0.235771	Mean dependent var		0.000563
Adjusted R-squared	0.179162	S.D. dependent var		0.005426
S.E. of regression	0.004916	Akaike info criterion		-7.711637
Sum squared resid	0.001305	Schwarz criterion		-7.535574
Log likelihood	232.4933	Hannan-Quinn criter.		-7.642909
F-statistic	4.164873	Durbin-Watson stat		1.876321
Prob(F-statistic)	0.005179			

The results show that the overall model is adequate due to a high F-statistic (4.164873) with a significant probability value of 0.005179. The results also concludes that the R^2 is 23.577%, which that means that 23.577% of variation in stock returns can be predicted using the selected macroeconomic variables. However, 76.4229% are external factors that could affect the predictable model. The development of the prediction model is applied by using the coefficient for each explanatory macroeconomic variable which can be observed in table above.

As results, the results showed that the oil price is the only macroeconomic indicator that was found to have a significant impact on stock returns which records a probability value of 0.0012, as such it is significant at level 0.01, this results is consistent with other studies such as Gjerde and Sættem (1999) and Gay (2008).

Although the other macroeconomic variables (inflation, interest rate and money supply) are not found to be significant in effecting stock returns. The negative sign of the coefficients for the inflation means that there is a negative relationship between inflation and stock return. In other words, any increase in inflation will cause stock price to fall. This results is consistent with other researchers' results such as Lintner (1973), Fama and Schwert (1977), Jaffe and Mandelker (1977), Geetha, Mohidin, Chandran and Chong (2011). The positive sign of the coefficients means that there is a positive relationship between the variables. Indeed, the interest rate and money supply coefficients are positive, meaning that an increase in interest rate and money supply will cause the price to increase as well. This results is consistent with other researchers' results such as Homa and Jaffe (1971), Uddin and Alam (2007), Geetha, Mohidin, Chandran and Chong (2011) and Mahedi (2012).

Granger Causality Test

The Granger causality model is aimed to test the relation between individual explanatory variables and stock return either unidirectional, bidirectional or no relation. In other words, the aim of Granger causality model is to explore whether the macroeconomic variables cause the stock return or vice versa (Sarbpriya, 2012). Furthermore, this statistical technique aims at determining whether past values (Lag) of a variable assist to forecast changes in another variable (Granger, 1988).

In order to detect the optimal number of Lags that shall be used in the Granger causality model, Akaike Information Criterion (AIC) test is employed. The results of the Akaike Information Criterion is summarized in Table 5.

Table 5: Akaike Information Criterion (AIC) Results

# Lags	Statistical Tool	AIC Value
Lag 1	Akaike information criterion	-10.9747
Lag 2	Akaike information criterion	-10.9905
Lag 3	Akaike information criterion	-10.4824
Lag 4	Akaike information criterion	-10.0447

As results, it can be seen in the table above that when the data was lagged once, the AIC records a value of -10.9747. Furthermore, when the data was lagged two times, the AIC records a value of -10.9905. In addition, when the data was lagged three times, the AIC records a value of -10.4824 and finally, when the data was lagged four times, the AIC records a value of -10.0447. The results of AIC are ranged between -10.9905 and -10.0447, the guideline of the AIC is the lower is the AIC value, the better is the model. Therefore, it is obvious in the results that the lowest AIC value is when the data was lagged two times. Therefore, the results of Granger causality test between macroeconomic variables and stock returns illustrated when the data was lagged two times is presented in table 6.

Table 6: Test for Granger Causality between Macroeconomic Variables and Stock Returns

Null Hypothesis:	Obs	F-Statistic	Prob.	Relationship
D(INF) does not Granger Cause SR	57	0.06793	0.9344	No Relationship
SR does not Granger Cause D(INF)		0.44884	0.6408	No Relationship
D(INT) does not Granger Cause SR	57	3.80001	0.0288	Bidirectional
SR does not Granger Cause D(INT)		3.53488	0.0364	Relationship
MS does not Granger Cause SR	58	0.27341	0.7618	No Relationship
SR does not Granger Cause MS		0.71381	0.4944	No Relationship
D(OP) does not Granger Cause SR	57	0.69506	0.5036	Unidirectional
SR does not Granger Cause D(OP)		3.40991	0.0406	Relationship
D(INT) does not Granger Cause D(INF)	57	1.15763	0.3222	Unidirectional
D(INF) does not Granger Cause D(INT)		2.99488	0.0587	Relationship
MS does not Granger Cause D(INF)	57	2.69459	0.077	Bidirectional
D(INF) does not Granger Cause MS		2.53601	0.0889	Relationship
D(OP) does not Granger Cause D(INF)	57	0.49969	0.6096	No Relationship
D(INF) does not Granger Cause D(OP)		0.0471	0.954	No Relationship
MS does not Granger Cause D(INT)	57	0.62175	0.5409	No Relationship
D(INT) does not Granger Cause MS		1.21011	0.3064	No Relationship
D(OP) does not Granger Cause D(INT)	57	0.11081	0.8953	No Relationship
D(INT) does not Granger Cause D(OP)		1.01288	0.3702	No Relationship
D(OP) does not Granger Cause MS	57	0.801	0.4543	No Relationship
MS does not Granger Cause D(OP)		1.75437	0.1831	No Relationship

The results in the table above conclude that there is bidirectional relationship between interest rate and stock return. In other words, stock price Granger causes interest rate. The results also showed that there is a unidirectional relationship between stock return and oil price since the null hypothesis is rejected which states that oil price does not Granger Cause stock return; the p-value (0.0406) is less than the critical value (5%). This means that that stock return Granger causes oil price.

The overall Granger Causality test reveals that stock price Granger causes interest rate. The results reveal also that stock return does Granger Cause the oil price. In other words, the interest rate granger causes the stock prices while the stock prices do not affect any of the other macroeconomic variables included in the research.

Conclusion

This aim of this study is to investigate the causal relationship between macroeconomic variables and stock returns by looking at the Saudi equity market. It was used monthly data for the period begins from January 2010 to December 2014. There are two econometric models have been conducted in this study, the first model is Ordinary Least Squared (OLS) which is aimed to examine the association between the macroeconomic variables and the stock return. The second model is Granger causality, this model is aimed to test the relation between individual explanatory variables and stock return (bidirectional). Augmented Dickey Fuller test was employed also to ensure the stationary of the data set. The results of the Augmented Dickey Fuller test showed that the level data of stock returns and money supply were stationary and the first difference of the oil price, interest rate and inflation rate were stationary. By looking at the stationary data, Ordinary Least Squared (OLS) was implemented. The results indicate that there was a positive and significant relationship between oil price and stock returns this results is consistent with other researchers' results such as Gjerde and Saettem (1999) and Gay (2008). The results showed that there is a negative relationship between inflation rate and stock returns. This results is consistent with other researchers' results such as Lintner (1973), Fama and Schwert (1977), Jaffe and Mandelker (1977), Geetha, Mohidin, Chandran and Chong (2011). Furthermore, the results of OLS concluded that there is a positive relationship between interest rate, money supply and stock returns. This results is consistent with other researchers' results such as Homa and Jaffe (1971), Hamburger and Kochin (1972), Uddin and Alam (2007), Geetha, Mohidin, Chandran and Chong (2011) and Mahedi (2012). The Granger Causality test showed that there is bidirectional relationship between interest rate and stock return. The results also showed that there is a unidirectional relationship between stock return and oil price The overall Granger Causality test reveals that stock price Granger causes interest rate. The results reveal also that stock return does Granger Cause the oil price. In other words, the interest rate granger causes the stock prices while the stock prices do not affect any of the other macroeconomic variables included in the research.

In general, it can be concluded that the macroeconomic indicators can significantly affect the stock returns in Saudi equity market. This helps the decision makers to predict Saudi stock returns by using macroeconomic variables namely, oil price and interest rate to make such appropriate decisions.

Future studies may also add certain macroeconomic variables such as import, export, gross domestic product that may affect the Saudi equity market but not relevant to developed markets. It is suggested that future research should consider investigating the ability of macroeconomic variables in forecasting the future economic condition as well as the financial crisis. Furthermore, interested parties may study the relationship between macroeconomic indicators and stock returns among gulf countries as a comparative study. In addition, future researches may put the spot light on other research methods to be employed such as co-integration tests as well as ARDL model.

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