CHAPTER SEVEN

MACROECONOMIC VARIABLES AND RETURNS

RESULTS AND ANALYSIS

The data used for this analysis are monthly data from 1999:4 to 2006:4 for six variables, namely industrial production (IP), narrow money supply (M1), Inflation (CPI), Kuala Lumpur composite index (KLCI), oil prices (OIL), and Kuala Lumpur Syariah Index (KLSI). The data were obtained from several sources such as International financial statistics website, Bank Negara and Kuala Lumpur Stock exchange. The description of the data is shown in Section 4.2 of Chapter 4.

This part aims at investigating whether KLCI and KLSI react similarly to the macroeconomic variables, whether there is a long run relationship between each index and the macroeconomic variables and the direction of causality between each index and the macroeconomic variables. The natural logarithm of all the macroeconomic variables and the stock market indices is used in this analysis of this part.

7.1 Series Characteristics

Table 7.1 and Table 7.2 below show the results of correlation between variables and the properties of the variables respectively. The correlation matrix shows that KLCI and KLSI are positively correlated and that industrial production is positively correlated with CPI, money supply, and oil prices. The correlation is above 0.90. The reason for the strong correlation between KLCI and KLSI is the inclusion of the latter of almost more than 60% of the former. Since the value of the correlation coefficient is above 0.90, the inclusion of

one index in the estimation of the other might cause spurious result and therefore misguided conclusion due to the problem of severe multicollinearity. Therefore, each index is estimated separately with the macroeconomic variables. Real activity, inflation, money supply and oil price correlation is due to their inter connection in the real world.

Table 7.1 Correlation matrix for the variables in the level

Variable	KLSI	KLCI	IP	M1	OIL	CPI
KLSI	1					
KLCI	0.97*	1				
IP	0.44*	0.57*	1			
M1	0.36**	0.53*	0.93*	1		
OIL	0.50*	0.63*	0.90*	0.87*	1	
CPI	0.31**	0.49*	0.91*	0.97*	0.88*	1

*, ** significant at 1% and 5%. Natural Log has been used in all series.

Table 7.2 is included to elaborate on the properties of the daily closing prices of both indices. The results have not much implication but simple statistical figures of the indices. In terms of skewness and kurtosis, the latter seems to exhibit positive values or platykurtic. The skewness suggests that all series are positively skewed except KLSI and KLCI where they are negatively skewed. However, the normality test suggests that the series are normally distributed.

Table 7.2 Descriptive statistics for all the variables in level form

Property	KLSI	KLCI	IP	M1	OIL	CPI
Mean	4.765	6.648	4.671	11.382	3.496	4.642
Std. Dev.	0.127	0.141	0.135	0.221	0.350	0.036
Skewness	-0.064	-0.178	0.052	0.051	0.475	0.449
Kurtosis	2.256	1.940	1.946	1.921	2.469	2.431
Jarque-Bera	2.020	4.425	3.974	4.156	4.192	3.999
Observations	85	85	85	85	85	85

Table 7.3 below illustrates the correlation matrix of the first differenced series or the growth rate during the period of the study. The severity of the correlation almost disappears or becomes insignificant except for KLCI with KLSI, which is still above 0.95. This is consistent with Ahmad et. al (2002), who found that KLCI and KLSI daily returns to be highly correlated at 0.967 from 1999 to 2002.

Table 7.3 Correlation matrix for the first differenced variables

Variable	KLSI	KLCI	IP	M1	OIL	CPI
KLSI	1					
KLCI	0.98*	1				
IP	-0.038	-0.068	1			
M1	0.202	0.24**	-0.192	1		
OIL	0.114	0.094	0.018	0.047	1	
CPI	0.052	0.053	0.124	0.153	-0.008	1

*and ** significant at 1% and 5%.

The properties of the series in the first difference are illustrated in Table 7.4. The growth rate of KLCI is higher than that of KLSI by almost 0.11%. In addition, industrial production, Inflation, money supply, and oil prices have a growth rate of 0.5%, 0.2%, 0.96%, and 1.6% respectively. In terms of normality, the variables are normally distributed except for inflation, for which the null hypothesis of normality is rejected. Both Kurtosis and Skewness reflect the same result as in the level form.

Table 7.4 Descriptive statistics for first differenced variables

Property	KLSI	KLCI	IP	CPI	M1	OIL
Mean	0.0030	0.0041	0.0055	0.0016	0.0096	0.0166
Std. Dev.	0.0528	0.0553	0.0422	0.0027	0.0278	0.0772
Skewness	-0.1522	-0.1780	0.1138	1.9730	0.4128	-0.5762
Kurtosis	2.9902	2.8155	2.7993	9.0772	4.1096	2.8177
Jarque-Bera	0.3245	0.5628	0.3222	183*	6.6943	4.7645
Observations	84	84	84	84	84	84

* Significant at 1%

7.2 Unit Root

As mentioned before in chapter 4 and in the analysis in chapter 6 unit root is a problem that need to be addressed before proceeding into any stage in time series analysis. The results in tables 7.5 and 7.6 indicate that in all series the null hypothesis of unit root cannot reject, which indicates that both indices are not stationary. Subsequently, when the null hypothesis of unit root is not rejected, it is concluded that the same tests on all variables in the first difference and that the null hypothesis of unit root can be rejected. Hence, all series are stationary in the first difference and therefore, all series are integrated of degree one or I (1). It is known from the random walk theory that the value of an asset at time t is equal to its value at time t-1 plus an error or disturbance term. It is reported that if the series is non-stationary in the level or has the problem of unit root, the common practice is to take its first difference that will make the series stationary. The results are in line with the literature on financial markets where stock prices are non-stationary in the level form.

The unit root problem suggests that the fluctuations in the prices are randomly moving and this implies that they represent one of the types of the market efficiency, namely weakly efficient. Fama (1970) hypothesized that if a market is weakly efficient, the historical information of past prices cannot be used to exploit a regular return pattern for obtaining

abnormal returns. The behavior of stock prices should be a random walk and stock returns should not be correlated in a weak-form efficient market. Hakim et al. (2003), Chan et al. (1997) and Chan et al. (1992) asserted that if a series is found to be non-stationary, then it is interpreted as a sign of market efficiency, specifically weak form efficiency.

Table 7.5 ADF test for stationarity[52]

Variable	Intercept	Trend and intercept	None
		Levels	
KLSI	-1.82	-1.92	0.477
KLCI	-1.64	-1.93	0.63
M1	-1.39	-3.99	3.15
IP	-1.10	-2.39	2.31
OIL	-0.719	-1.75	1.88
CPI	2.015	-0.011	5.62
		First difference	
KLSI	-8.20*	-8.16*	-8.24*
KLCI	-8.39*	-8.36*	-8.41*
M1	-7.99*	-7.94*	-7.38*
IP	-16.97*	-16.87*	-16.36*
OIL	-8.57*	-8.51*	-8.25*
CPI	-9.49*	-10.06*	-3.55*

* Significant at 1%. Zero lag was used in all the variables.

Table 7.6 PP test for stationarity[53]

[52] lags are determined by Schwartz Information criteria

Variable	Intercept	Trend and intercept	None
	Levels		
KLSI	-1.94 (1 lag)	-2.05 (1 lag)	0.45 (1 lag)
KLCI	-1.75 (1 lag)	-1.93 (0 lag)	0.61 (3 Lags)
M1	-1.45 (7 lags)	-4.23 (3 lags)	4.10 (8 lags)
IP	-1.36 (2 lags)	-4.45 (5 lags)	1.13 (1 lag)
OIL	-0.62 (4 lags)	-1.78 (2 lags)	2.07 (5 lags)
CPI	2.42 (4 lags)	0.323 (3 lags)	5.62 (0 lag)
	First difference		
KLSI	-8.19* (2 lags)	-8.14* (3 lags)	-8.23* (2 lags)
KLCI	-8.37* (4 lags)	-8.34* (4 lags)	-8.40* (4 lags)
M1	-10.17* (11 lags)	-9.94* (11 lags)	-7.30* (4 lags)
IP	-17.49* (1 lag)	-17.39* (1 lag)	-16.40* (3 lags)
OIL	-8.54* (6 lags)	-8.49* (6 lags)	-8.22* (3 lags)
CPI	-9.49* (1 lag)	-10.05* (1 lag)	-7.50* (4 lags)

* Significant at 1%

7.3 Cointegration

Nasseh and Strauss (2000) summarized the main target of imposing cointegration technique as follows; first, stock market activity explains future production, since stock market is considered as a barometer for the economic health. Second, the stock market possesses higher volatility than underlying macroeconomic activities. This is because stock prices are determined daily by the power of demand and supply. Third, real activity explains more stock price variation over long time horizons. It is considered as long-term investment portfolio and it add the permanent component to the stock market.

Based on the unit root test, both series are integrated of degree one or I (1). Subsequently, two types of cointegration tests are performed. The result for Johansen cointegration test, which follows maximum likelihood estimation, is reported in Tables 7.7 and 7.8. The null hypothesis of no cointegration suggests that the relationship between the series is spurious. The tables below show the results of Johansen cointegration in 1 lags determined by

[53] lags are determined by Newey-west bandwidth

Schwartz information criteria. It is clear that there is only one cointegrating vector, where the null hypothesis that there is no cointegrating vector is rejected based on Maximum Eigen value and Trace statistics. Subsequently, it is concluded that there is a long-term relationship between KLSI and KLCI with all the variables. It means that all series will tend to trend together in the long term.

Table 7.7 Johansen Cointegration test result for KLSI

Number of Cointegrating Vector	Trace Statistic	Max-Eigen Statistic
No cointegration r =0	77.02*	41.56*
At least one cointegration equation r≤1	35.46	18.00
At least two cointegration equations r≤2	17.45	11.24
At least three cointegration equations r≤3	6.21	5.74
At least four cointegration equations r≤4	0.47	0.47

* Significant at 1%

Table 7.8 Johansen Cointegration test result for KLCI

Number of Cointegrating Vector	Trace Statistic	Max-Eigen Statistic
No cointegration (r =0)	76.48*	40.69*
At least one cointegration equation r≤1	35.78	17.60
At least two cointegration equations r≤2	18.18	11.82
At least three cointegration equations r≤3	6.37	5.99
At least four cointegration equations r≤4	0.37	0.37

* Significant at 1%

The cointegration equation is as shown below,

$$KLSI = -29.23 + 7.785IP + 13.6CPI - 5.6M1 - 0.83OIL$$

t-statistics (6.35) (2.36) (-5.1) (-2.62)

$$KLCI = -38.31 + 8.24IP + 17.28CPI - 6.19M1 - 0.94OIL$$

t-statistics (6.087) (2.65) (-5.8) (-2.65)

The cointegration equations suggest a positive relationship between KLSI, and KLCI with Industrial production and inflation. On the other hand, they are negatively related to money supply and oil prices. The positive relationship between KLSI and industrial production is expected since an increase in the real activity will increase the production and revenue causing profit to increase. Moreover, the positive relationship of inflation with KLSI is in line with the fisher effect where the stock return should reflect expected inflation. All this is supported by previous studies on Malaysia such as Ibrahim (2003), Ibrahim et. al. (2001) and Ibrahim et. al. (2003), which found that real activity and inflation are positively related to stock prices. According to Ibrahim (2003), Ibrahim et. al. (2001) and Ibrahim et. al. (2003), the positive relationship between KLSI and inflation suggest that stock prices are a good hedge against inflation. In addition, the negative relationship between money supply and both indices i.e. KLSI and KLCI is in contradiction with the findings of Ibrahim (2003), Ibrahim (2001), Wongbangpo et. al. (2002) and Ibrahim et. al. (2003), which showed that money supply, either M1 or M2, is positively related to stock prices in the case of Malaysia. Lastly, the relationship between KLSI and oil prices suggests that an increase in oil prices cause KLSI to react negatively. This is in line with studies such as Cheung et. al. (1998) for Canada, Japan, Germany, Italy, and U.S. and Hondroyiannis et. al. (2001) and Papapetrou (2001) for Greece. The explanation of the long-term equation follows the ordinary explanation of any multiple regression models. One percent increase in IP, KLCI, and CPI will cause KLSI to increase by 1.43%, 0.82, and 1.02 respectively. On the other hand, an increase of M1 and oil prices causes KLSI to decrease by 0.85% and 0.15% correspondingly. This implies that KLSI and KLCI react similarly to this set of variables in the long term.

7.5 Causality Tests

7.5.1 Granger Causality

Table 7.9 below reports the results on the Granger causality for KLSI, KLCI, and the macroeconomic variables. The results suggest that there a bidirectional causality between KLCI and M1 and KLCI and M1. This shows that money supply has an impact on both indices and these indices influence money supply. In addition, the rate of inflation leads KLCI and KLSI indicating a unidirectional causality from CPI to KLSI and KLCI but not vice versa. Lastly, the results indicate that money supply lead the economic growth reflecting that increase in money supply is transferred to the real activity and spurring growth and not inflation.

Table 7.9 Granger causality

Null Hypothesis	Chi square
KLSI does not Granger cause IP	1.18
IP does not Granger cause KLSI	0.66
KLCI does not Granger cause IP	1.46
IP does not Granger cause KLCI	0.29
KLSI does not Granger cause M1	5.44*
M1 does not Granger cause KLSI	5.84**
KLCI does not Granger cause M1	5.34**
M1 does not Granger cause KLCI	6.63**
KLSI does not Granger cause CPI	0.16
CPI does not Granger cause KLSI	9.43*
KLCI does not Granger cause CPI	0.12
CPI does not Granger cause KLCI	11.16*
KLSI does not Granger cause OIL	0.92
OIL does not Granger cause KLSI	2.23
KLCI does not Granger cause OIL	1.96
OIL does not Granger cause KLCI	1.61
IP does not Granger cause CPI	0.23
CPI does not Granger cause IP	2.20
IP does not Granger cause M1	1.94
M1 does not Granger cause IP	9.41*
IP does not Granger cause OIL	1.01
OIL does not Granger cause IP	0.28
CPI does not Granger cause M1	0.03
M1 does not Granger cause CPI	0.21
CPI does not Granger cause OIL	1.97
OIL does not Granger cause CPI	1.38
M1 does not Granger cause OIL	0.28
OIL does not Granger cause M1	0.04

* and ** significant at 1% and 5 % respectively.

7.5.2 Vector Error Correction Coefficients

Table 7.10 shows the error correction coefficients for KLSI equation with the macroeconomic variables. The only significant error coefficients are in industrial production and money supply. It is clear from the table that only Industrial production and money supply carry the burden of making the adjustments when there is any disequilibrium in the stock market index or any of the other variables in the system. In other words if any of the variables included deviates from it long term equilibrium the deviation is corrected by changes in industrial production and money supply. The meaning of the error correction terms in the KLSI equation is that about 4.6% and -4.8 in the deviation in KLSI is corrected the next month by industrial production and money supply respectively. This means that the adjustments are very slow in KLSI.

Table 7.11 shows the error correction coefficients for KLCI equation with the macroeconomic variables. Similar to table 7.10 the only significant error coefficients are in industrial production and money supply. It is clear from the table that only Industrial production and money supply carry the burden of making the adjustments when there is any disequilibrium in the stock market index or any of the other variables in the system. This means that about 4.1% and -4.3 of the deviation in KLCI is corrected by industrial production and money supply in the next month respectively. Yet again, this means that the adjustments are very slow in KLCI as it was found out in the previous table of KLSI. The full tables of the estimations result on VECM are provided in the appendix B.

Table 7.10 Error correction coefficients for all variables

	KLSI	IP	CPI	M1	OIL
EC_{t-1}	0.016	**0.046***	0.001	**-0.048***	0.023

* Significant at 1%.

Table 7.11 Error correction coefficients for all variables

	KLCI	IP	CPI	M1	OIL
EC_{t-1}	0.007	**0.041***	0.001	**-0.043***	0.017

* Significant at 1%.

7.6 Impulse Response and Variance Decomposition

Impulse response traces out the response in all the variables in the system to shocks in the error, while variance decomposition examines the proportion of variation of one variable that is due to its own shocks and due to other variables shocks. The robustness of impulse response and variance decomposition in determining the direct (i.e. from one variable to the other) and the indirect (i.e. the indirect influences transmitted from other variables) dynamic innovations have been proven by many studies. Ibrahim (2001), Handroyiannis et. al. (2001), Ibrahim et. al. (2001) and Hess (2004) showed that the causal relationship and the degree of endogeneity or exogeneity of the variables could be better explained by these two techniques. In variance decomposition, a variable is endogenous if shocks can explain all the forecast error variance in a variable at all forecast horizon. The opposite is true for exogeneity.

Figure 7.1 below shows the response of each explanatory variable that is caused by shocks in KLSI. The first variable is the money supply where the shocks in KLSI will cause money supply to be positive for the first 4 months however, it become negative and remains stable for the rest of the period. This is in line with the VECM result in the appendix B that shows a positive reaction of money supply towards KLSI. The second variable is the price of oil

or OIL. The impulse response function shows clearly that any shock in KLSI causes OIL to be positive and increases in first 4 months and stabilizes after that. Similar to money supply the result of impulse response confirms earlier results in VECM where oil prices are affected positively by KLSI. The third variable in the graph below is the rate of inflation or CPI. The result suggests that shocks in KLSI have a positive but decreasing effect on CPI in first 2 months where CPI reach zero. However, after the end of the second month the response in CPI jumps up in one month and then decreases to stabilize for the rest of the period. This result contradicts the result in VECM where a shock in KLSI has a negative impact on CPI. The last variable is the real activity or the industrial product IP. The graph of the impulse response shows that shocks in KLSI causes IP to move downward from positive impact to negative in the first 2 months only to revert back to increasing and positive up to the fifth month where it start to stabilize. Similar to money supply and oil price the result of impulse response for IP reflect the result of VECM where there is a negative impact of KLSI on IP.

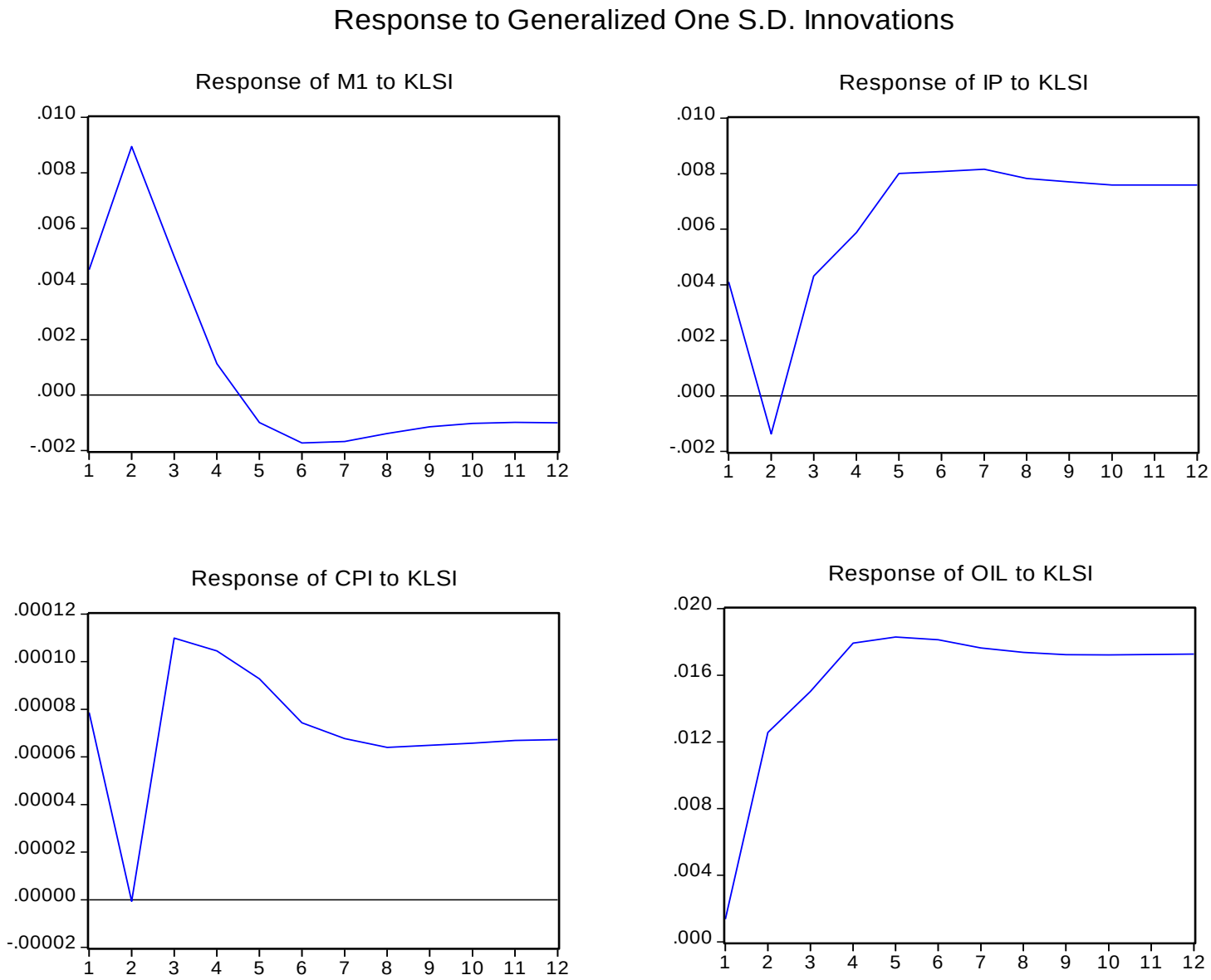
The second part of figure 7.1 shows the response of KLSI and KLSI to shocks in the independent variables. The first graph shows the response of KLSI and KLCI to shock in M1. The response of KLSI and KLCI to shocks in M1 is positive for the whole period. KLSI and KLCI jump from 1% to almost 3% in the first month but it stabilizes after the third month between 2% and 3%. This is also supported by the result in VECM where M1 has a positive impact on KLSI and KLCI. The positive influence indicates that as the money supply increases initially the stock market will absorb this shock by increasing the returns. The increase in money supply will lead to decrease in interest rates that in return lead to easy borrowing and therefore increase in investment portfolio and some of this investment portfolio will be in stock market. The relationship between M1 with KLSI and

KLCI from the cointegration equation appears to be negative. However, the result in the impulse response suggests otherwise. One standard deviation shock in M1 will cause KLSI and KLCI to increase from 1% to almost 3% in 4 months. Then it is reduced to reach 2.5 in the seventh month and to stabilize at that rate for the rest of the period. This indicates a temporary wealth effect in the economy in the short run. However, the conflicting results can be interpreted as Ibrahim (2001) put it, namely that in the long term the negative effect eliminates the short-term positive effect.

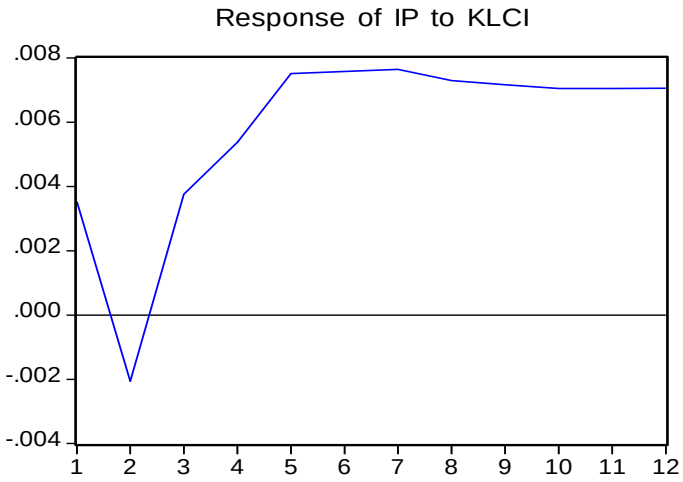
Figure 7.2 shows the impulse response of KLSI and KLCI to the shocks in the macroeconomic variables. The first graph shows the response of KLSI and KLCI to shocks in oil prices or OIL. It decreases by 1% from zero in the first month and remains at that level for the entire period. The result is in line to VECM result where there is a negative impact on KLSI and KLCI for any shocks in oil prices. The transmission of the impact comes from the supply side economy where the increase in oil prices causes cost of production to increase, this might cause prices to increase, and the total output to decrease, and this will lead to a decrease in the stock market returns. The third variable is the rate of inflation CPI, the response of KLSI and KLCI to CPI is positive all the way. It jumps from zero to 2% in the first month and stabilizes for the rest of the period. The result confirms the results in VECM of positive impact of CPI on KLSI and KLCI. As it has been mentioned in chapter 4 it was found by Ibrahim (2003), Ibrahim (2001) and Ibrahim and Aziz (2003) that in case of Malaysia the relationship between rate of inflation and stock market return is positive indicating that investing in the stock market is a good hedge against inflation. The last graph is the response of KLSI and KLCI to shock in IP. The result suggests that KLSI and KLCI respond positively to shocks in IP. It starts at almost 0.6% and with few months, it reaches 1% and stabilizes at that level for the remaining time

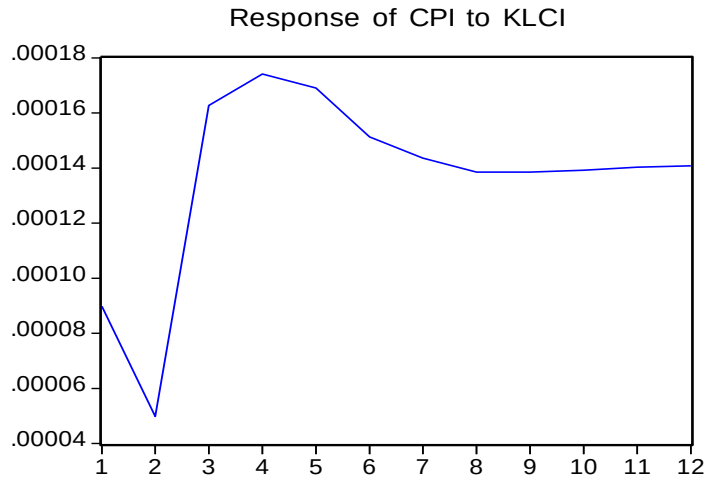
line. Similarly, the result of impulse response is in line with the result reported in VECM where it is found that IP has a positive impact on KLSI and KLCI. The justification of the relationship is that when the economy is experiencing an expansion this will lead to higher incomes and higher demand that will lead to higher supply too and therefore the prices of shares will start to increase too.

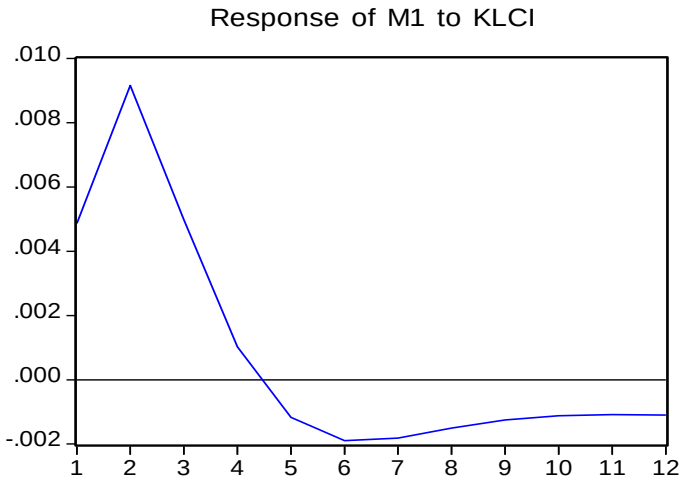
Figure 7.1 Impulse responses for the macroeconomic variables



Response to Generalized One S.D. Innovations







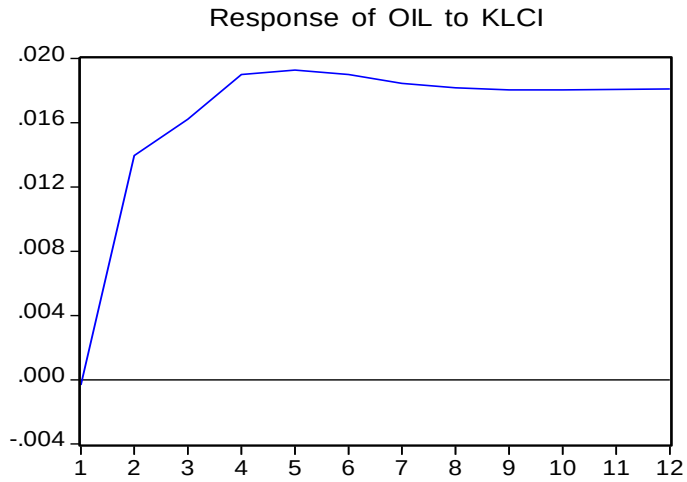
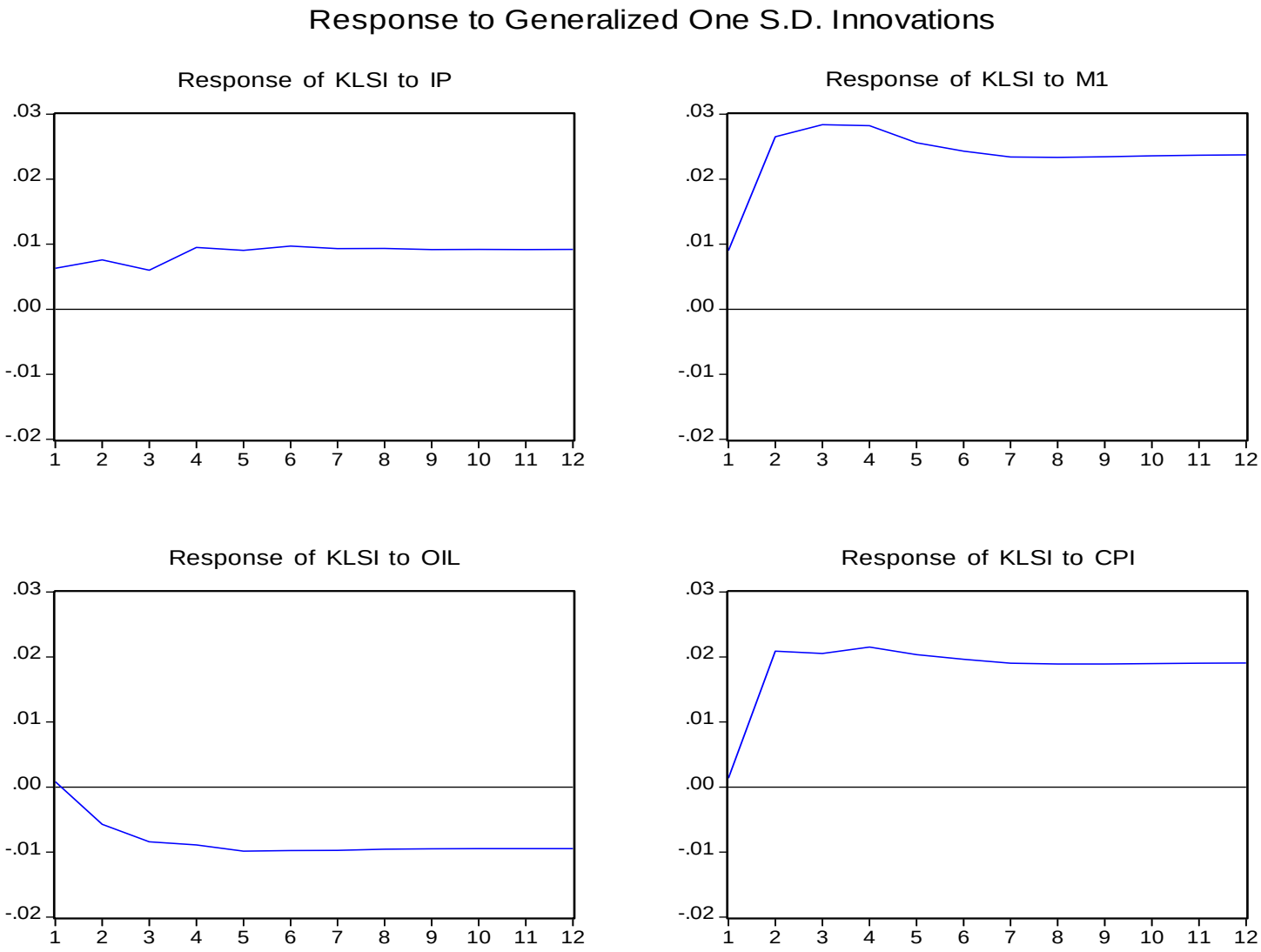
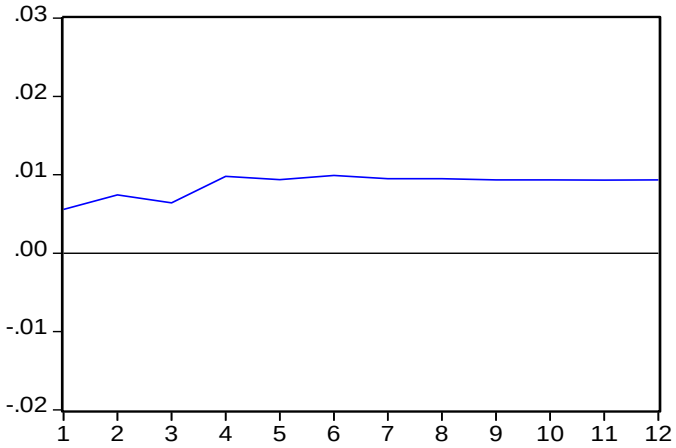


Figure 7.2 Impulse responses for KLSI and KLCI

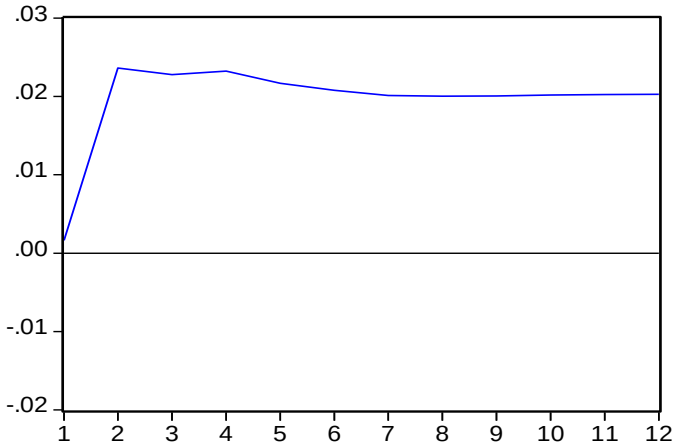


Response to Generalized One S.D. Innovations

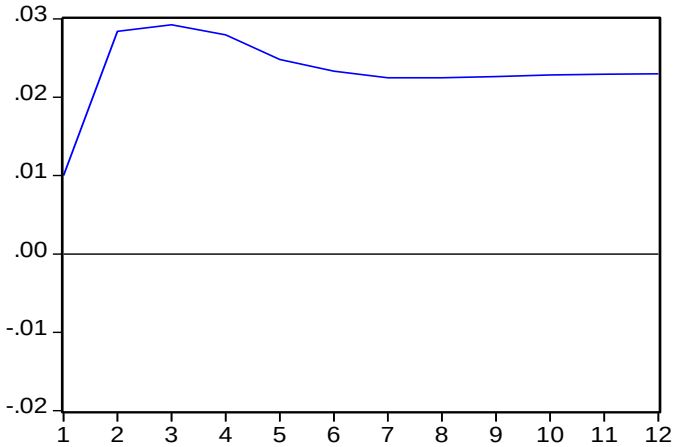
Response of KLCI to IP



Response of KLCI to CPI



Response of KLCI to M1



Response of KLCI to OIL

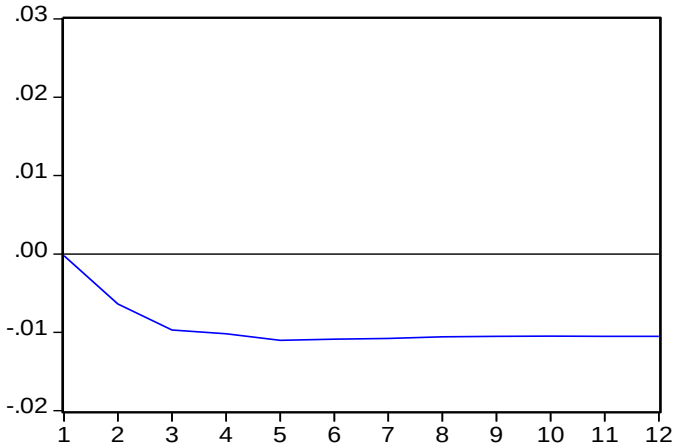


Figure 7.2 depicts the impulse responses of KLCI with all four variables. The result is similar to the one reported for KLSI and the same variables. All the variables have the same relationship as indicated by the cointegration equation except for money supply, which in the cointegration equation was reported to be negative, while it is positive here. The Granger causality suggests unidirectional causality from CPI towards KLCI. However, in the impulse response the results suggest that the causality is bidirectional in all cases.

Table 7.13 reports the results of the variance decomposition of the five variables in the following order, IP, OIL, M1, CPI, and KLSI. The order is justified in the methodology section. The reported numbers indicate the percentage of the forecast error in each variable that can be attributed to innovations in other variables at five different time horizons. The variation in KLSI is dominated by KLSI itself and M1, where KLSI explains 72% and M1 explains 17.8% of KLSI in first 6 months. This does not change after 24 months. In addition, 77% of the variability in IP is explained by itself followed by M1 by 13% in the first 6 months. However, the variability of IP explained by M1 doubles in the 24 months to reach 24%. Money supply is influenced by 58% by its own variation in the first 6 months and by 34% from M1, however with time the variation in M1 is predominantly explained by IP by 45%, 51% and 54l% in 12, 18 and 24 months respectively. This could lead to the conclusion that money supply is the most endogenous variable in the system. Inflation seems to be the most exogenous variable since 88% of the variations in it is explained by itself for the 24 months, followed by M1 by 10%. Similarly, oil prices are explained by their innovations by 88% in the first 6 months, followed by M1 by 5% only. The percentage decreases to 86% in the 24th month for OIL itself and increase by 1% for M1.

Table 7.13 Variance decomposition (IP, OIL, M1, CPI, and KLSI)

Variance decomposition of	Period	IP	OIL	M1	CPI	KLSI
Innovations in IP	6	76.982	3.634	12.669	3.685	3.029
	12	67.960	4.149	20.120	2.603	5.165
	18	64.596	4.392	22.837	2.219	5.955
	24	62.777	4.521	24.307	2.010	6.382
Innovations in OIL	6	2.228	88.686	4.832	2.408	1.844
	12	2.317	87.064	5.649	2.838	2.130
	18	2.341	86.548	5.913	2.974	2.222
	24	2.354	86.291	6.044	3.042	2.268
Innovations in M1	6	33.940	5.085	58.145	0.556	2.272
	12	45.773	6.564	43.131	0.530	3.999
	18	51.032	7.238	36.579	0.493	4.657
	24	54.018	7.619	32.858	0.472	5.031
Innovations in CPI	6	0.519	0.906	10.131	88.432	0.011
	12	0.444	1.031	10.265	88.248	0.009
	18	0.421	1.070	10.326	88.173	0.009
	24	0.409	1.090	10.356	88.135	0.009
Innovations in KLSI	6	2.027	2.467	17.828	5.476	72.200
	12	2.340	3.063	17.230	5.698	71.667
	18	2.435	3.248	17.085	5.775	71.454
	24	2.483	3.341	17.010	5.814	71.349

Table 7.14 reports the variance decomposition for KLCI. KLCI variation is explained by itself by 70% in the first 6 months and 12% by M1 and 12% by CPI. In 24 months, 69% of the variability of KLSI is explained by its own variations followed by M1 by 11% and CPI by 13%. CPI is the most exogenous variable where 96% of its variation is solely explained by itself. Moreover, M1 is the most endogenous variable where 54% of its variation in the first 6 months is explained by itself and 32% by IP, however, after 24 months the opposite happens where 51% of the variation in M1 is explained by IP and only 33% is explained by M1. Oil price continue to be dominated by their variation where 87% in the first 6 months and 84% in the 24 months is explained by the variation of OIL and only 5% to 6% by CPI in the same time horizons.

Table 7.14 Variance decomposition (IP, OIL, M1, CPI, and KLCI, ordering)

	Period	IP	OIL	M1	CPI	KLCI
Innovations in IP	6	78.00	3.62	12.05	3.71	2.61
	12	69.92	4.17	19.42	2.13	4.36
	18	66.90	4.43	22.17	1.49	5.00
	24	65.27	4.57	23.66	1.15	5.35
Innovations in OIL	6	2.81	86.91	3.03	4.54	2.71
	12	2.94	85.17	3.49	5.35	3.05
	18	2.97	84.61	3.64	5.61	3.16
	24	2.99	84.34	3.72	5.74	3.22
Innovations in M1	6	31.56	5.52	54.32	6.21	2.39
	12	43.03	7.24	41.48	4.04	4.22
	18	48.19	8.03	35.79	3.06	4.92
	24	51.14	8.48	32.54	2.50	5.33
Innovations in CPI	6	0.73	0.91	1.42	96.93	0.01
	12	0.66	1.03	1.47	96.83	0.00
	18	0.65	1.07	1.50	96.79	0.00
	24	0.63	1.09	1.51	96.77	0.00
Innovations in KLCI	6	2.04	3.10	12.06	12.37	70.43
	12	2.42	3.84	11.13	12.54	70.07
	18	2.54	4.08	10.86	12.62	69.90
	24	2.60	4.20	10.72	12.66	69.82

7.6 Conclusion

In this chapter, three hypotheses are tested, namely there is no long-term relationship between Syariah index and the selected macroeconomic variables, and there is no long-term relationship between non-Syariah index and the selected macroeconomic variables and whether there is no significant difference in the reaction of stock returns to macroeconomic variables between screened and non-screened indices. The results indicate that there is cointegration between Syariah index and the selected macroeconomic variables, which leads to the conclusion that the screening act does not have any effect on the returns. Furthermore, it is found that both indices react similarly to the same macroeconomic variables. In terms of Granger causality there is bidirectional causality between KLSI and price level while there is unidirectional causality from money supply

towards KLSI and from KLSI towards real activity or GDP. KLCI has a bidirectional relationship with money supply, while there is a unidirectional relationship running from price level towards KLCI and from KLCI towards real activity. Variance decomposition findings are consistent for both KLSI and KLCI where price level is the most exogenous followed by oil prices, KLSI or KLCI, real activity, and the most endogenous variable is money supply.