LONG-RUN AND SHORT-RUN RELATIONSHIP BETWEEN STOCK MARKET INDEX AND MAIN MACROECONOMIC VARIABLES PERFORMANCE IN JORDAN

Ahmad A. Al-Majali
Research Department, Central Bank of Jordan, Amman, Jordan
Ghazi I. Al-Assaf
Business Economics Department, The University of Jordan, Amman, Jordan

Abstract

This study aims to investigate whether the Amman Stock Exchange (ASE) performance, as measured by the stock price index, is affected by a set of macroeconomic variables. Namely, Real Gross Demotic Product, Consumer Price Index, Credit to Privet Sector, Weighted Average Interest Rate on Time Deposit, and dummy variable explain the global financial crises period. The data used in the study are quarterly data from 1992:Q1-20014:Q1. To examine whether this effect exists or not, Johansen cointegration test and Vector Error Correction model (VECM), Impulse Response Function (IRF) and Variance Decomposition (VD) are employed. The empirical results indicate that there a long run equilibrium relationship among stock market index and the main macroeconomic variables in Jordan. The findings of the study have showed that the speed of adjustment in the VECM is significant and relatively slow. This implies that long run movements of the variables are determined by one equilibrium relationship. The results also indicate that there is a bi-directional long run relationship between stock price index and credit to the private sector, weighted average interest rate on time deposits, and consumer price index. The evidence implies that an increase in the weighted average interest rate on time deposits in the banking system has a greater effect on the stock price index than other macroeconomic and financial variables.

Keywords*:* ASE stock price index, weighted interest rate on time deposit, credit to privet sector, Vector Error Correction model (VECM)

Introduction

Stock markets play an essential role in growing industries that ultimately affect the economy through transferring available funds from units that have excess funds (savings) to those who are suffering from funds deficit (borrowings) (Padhi and Naik, 2012). In other words, capital markets facilitate funds movement between the above mentioned units. This process leads to the enhancement of available financial resources which in turn affects the economic growth positively. Moreover, both of economic and financial theories argue that stocks' prices are affected by the performance of main macroeconomic variables.

Capital markets attract domestic and foreign capitals which contribute in achieving economic growth and increasing foreign reserves through the indirect (Portfolio) investment. There are different views about the role of policies in the bourse performance. For example, when bad performance is achieved, some blame for policies, particularly monetary policy, is oriented. Theoretical approach suggests that the performance of a capital market is affected, either positively or negatively, by the overall economic activity. Therefore, some main macroeconomic indicators have been taken into consideration to study their impact on stocks' prices.

This study attempts to test the relationship between main macroeconomic variables (Real Gross Domestic Product (GDP), Consumer Price Index (CPI), Credit Facilities Extended by Licensed Banks to Private Sector (Resident), Weighted Average Interest Rate on Time Deposits (DR), Dummy Variable denote to global financial crisis) and the stocks' price index, and then the key question is that if this relationship exists, is it stable in the long run?. Knowing that Amman Stock Exchange (ASE) is relatively less developed compared to international markets such as U.S., U.K., Japan and other markets in terms of its size, available financial instruments and trading mechanism. In other words, the purpose of the study is to determine whether the returns of the shares are related to the current economic activities for the ASE case or not.

The answer to the question whether macroeconomic variables might affect the performance of ASE can be obtained from cointegration analysis. The advantage of testing for cointegration is the identification of a stable long run relationship between stock price index and the macroeconomic variables, which could be implemented using various cointegration methodologies.

There are plenty of reasons to choose this topic, There is an increasing attention by the public, individuals and institutions, in capital markets especially, after the remarkable performance achieved by ASE in 2005 and at the same time after the global financial crisis. Capital markets play a vital role in achieving a sustainable economic growth, and the

improvement in the capital market reflects the degree to which the domestic economy is developed. Hence, the capital market is considered as a mirror for the economic activity.

Review of Literature

Numerous studies investigate the link between economic variables and stocks' prices can be divided into two broad group. The first group is such studies which investigated the impact of macroeconomic factors on stock prices, and the second group focused on the link between the stock market volatility and volatility in the macroeconomic indicators. Since the present study is based on the first group, we will then review the following related studies.

One of the first papers that investigated the linkages between stock market and macroeconomic variables is done by Fama (1981). The study found strong relationship between the real output and stock prices. Also Chen et al. (1986) found systematic influence set of economic variables on stock market price for US. The authors showed that the economic state variables systematically affect the stock return via their effect on future dividends and discount rates. Mukherjee and Naka (1995) also found that the Japanese stock market is cointegrated with these set of variables indicating a long-run equilibrium relationship between the stock market return and the selected macroeconomic variables (inflation, money supply, exchange rate, industrial production index, the long-term government bond rate and call money rate). Moreover, another study for Mookerjee and Yu (1997) revealed that both narrow and broad money supply affect the Singapore stock returns positively.

Pethe and Karnik (2000) employed an error correction model to study the inter-relationship between stock price and macroeconomic variables. Their study discovered that the state of economy and the prices on the stock market do not show signs of a long run relationship. Wongbampo and Sharma (2002) investigate the effect of macroeconomic variables (inflation, money supply, GNP, interest rate, and exchange rate) on stock returns in Asian countries. They found that, in the long run positively correlated to growth and negatively related to the aggregate price level. However, they found a negative relationship between stock prices and interest rate for Philippines, Singapore and Thailand, but positive relationship for Indonesia and Malaysia. While Altay (2003) conducted the same investigation for the Germany and Turkey stock markets and the results show that interest rate and inflation rate have a significant effect for German market but insignificant for Turkish. In addition, Ray and Vani (2003) and study the link between the stock market and real economic variables in the Indian stock market. Using a VAR model, the empirical results show that, interest rate, industrial production, money supply, inflation rate and exchange rate are found to have significant effects

on stock prices. This finding is also confirmed by Ahmed (2008) and Pal and Mittal (2011).

Many of the previous studies have used time series analysis to analyze the relationship between macroeconomic variables and stock prices, Maysami et al. (2004) found through employing a vector error correction model (VECM) a significant long-run equilibrium relationship between the Singapore stock market and the macroeconomic variable tested. Gan et al. also (2006) tested the relationships between stock market index in New Zealand cointegration and Granger causality test, and found a long run relationship between market index and the macroeconomic variables (Namely; the real GDP, money supply and interest rate). However, Ratanapakorn and Sharma (2007) obtained the same results in terms of the positive effect of money supply, short term interest rate, industrial production, inflation, and exchange rate, on stock prices, but not for the long term interest rate.

Other studies focused on the effects of macroeconomic variables on stock market index as well as stock market returns. Brahmasrene and Jiranyakul (2007) investigate this linkage for Thailand. Their results demonstrate that money supply has a positive impact on the stock market index, while the industrial production index, the exchange rate and oil prices have a negative impact. Robert (2008) examined the effect of two macroeconomic variables (exchange rate and oil price) on stock market returns for four emerging economies, namely, Brazil, Russia, India and China us. He affirmed that there was no significant relationship between present and past market returns with macroeconomic variables

Rahman et al. (2009) linked between the macroeconomic variable and Malaysian stock market returns by employing co-integration approach and vector error correction model (VECM). They found that interest rates, reserves and industrial production index were positively related while money supply and exchange rate were inversely related to Malaysian stock market return in the long run.

A more recent paper is conducted by Akbar et al. (2012) examined the relationship between the Karachi stock exchange index and macroeconomic variables using vector error correction model (VECM), they found a long-run equilibrium relationship exists between variables. Their results indicated that stock prices were positively related with money supply and short-term interest rates and negatively related with inflation and foreign exchange reserve.

Naik and Padhi (2012) investigates the relationships between the Indian stock market index (BSE Sensex) and five macroeconomic variables (industrial production index, wholesale price index, money supply, treasury bills rates and exchange rates) using Johansen's co-integration and VECM

The analysis reveals a long-run equilibrium relationship exists between variable. It is observed that the stock prices positively relate to the money supply and industrial production but negatively relate to inflation. The exchange rate and the short-term interest rate are found to be insignificant in determining stock prices. A very recent studies by Attari and Safdar (2013) and AL- Shubiri F.N.(2013) tested the relationships between macroeconomic variables and stock returns analyzed in the developed and developing countries. Attari and Safdar (2013), using the Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) approach found that macroeconomic variables have substantial influence on the stock prices. AL- Shubiri F.N. (2013) investigates the relationship between economic variables and abnormal returns in Amman stock exchange. The results indicate that the, consumer price index, gross fixed capital formation and money supply on index abnormal stock returns is statistically significant and no significant industrial production index and money market interest rate Index and Abnormal returns.

Data and Methodology

Despite the highly increased interest in investigating the factors affecting stock market performance, little work has been done to improve the understanding of the influences of macroeconomic variables on stock market. The main reasons for this are the scarcity and inaccuracy of data. Most previous work has investigated this linkage using a cross sectional data for a group of countries.

In this study, quarterly time series would be used from 1992-2014 for all variables. The included variables in this study are the Stock Price Index (SPI), Real Gross Domestic Product (GDP), Consumer Price Index (CPI), Credit Facilities Extended by Licensed Banks to Private Sector (CP), Weighted Average Interest Rate on Time Deposits (DR), and Dummy variable denote to global financial crisis (DUM_CRIS) 1992:Q1-2014:Q1 (all variable adjusted for seasonal adjustment using X-12 approach). The main data sources were the Central Bank of Jordan[23].

As previously mentioned, this study aims at testing the long and short run causality relationship between the stock's index and main macroeconomic variables in Jordan. It comes to examine the relationship between the variables of the study and to give, as much as possible, accuracy in the prediction of the relationship, the existence of stationary and cointegration in and between time series would be tested. This test allows us implementing the (VECM) model which assumes all variables to be endogenous.

[23] *Plot of these series is available in the Figure 1A in the appendix of this paper.*

Stationary Test (Unit Root Test): Since variables are mostly non-stationary and because the OLS approach gives spurious results which requires testing that the variables are stationary or not, which measured through testing the stability of mean and variance through a period of time (no trend exists). In addition, the value of covariance between any two closed values depends only on the lag period. In this field, both of Dickey and Fuller improved a test for the above mentioned conditions. In order to analyze the deterministic trends, we used modified versions of the likelihood ratio tests suggested by Dickey and Fuller (1981). If the expected (calculated) value, in absolute term, is less than the table value (or the p-value more than 5%), this means that data are non-stationary.

Cointegration Test: If the series used become stationary at the same level I(1), then it would be possible to the linear combination of the variables to be stationary at the zero level I (0) which means that the data are cointegrated. It is also possible to have more than one linear combination, and so more than cointegration relationship between the variables exists. Johansen and Juselius (1990) provided two likelihood ratio tests to obtain the number of cointegrated vectors, which are insignificantly different from unity.

$$\lambda_{trace}(r) = -T \sum_{i=r+t}^{n} \ln(1 - \hat{\lambda}_i) \quad (1)$$

$$\lambda_{max}(r, r+1) = -T \ln(1 - \hat{\lambda}_{r+1}) \quad (2)$$

where , $\hat{\lambda}_i$ equals the estimated eigenvalue of the characteristic roots, r- 0,1,2,..,T= number of observations. The null hypothesis of the first test (trace) is to test if the number of distinct cointegrated vectors is less or equal r against the alternative. The null of the second (max) test is the number of cointegrating vectors r against the alternative of r+1 cointegrating vectors. The results obtained from this test are used in applying the VECM which measures the long – run relationship.

Vector Error Correction Model: The vector error correction model (VECM) can lead to a better understanding of the nature of any nonstationarity among different component series and used to identify equilibrium or a long-run relationship among the variables, and can also improve longer term forecasting. The VECM(p) form with the cointegration rank $r(\leq k)$ is written as

$$\Delta \mathbf{y}_t = \boldsymbol{\delta} + \Pi \mathbf{y}_{t-1} + \sum_{i=1}^{p-1} \Phi_i^* \Delta \mathbf{y}_{t-i} + \boldsymbol{\varepsilon}_t \quad (3)$$

where Δ is the differencing , where α and β are $k \times r$ matrices; Φ_i^* is a $k \times k$ matrix., and y : the variable matrices [Stock Price Index (SPI), Real Gross Domestic Product (GDP), Consumer Price Index (CPI), Credit Facilities Extended by Licensed Banks to Private Sector (CP), Weighted Average Interest Rate on Time Deposits (DR), and Dummy variable denote to global financial crisis (DUM_CRIS)]

Variance Decomposition Test: Sometimes there is sudden shocks affect variables. Therefore, this test comes to analyze the error in the evaluation process that is resulted from other variables in the VECM model.

Impulse Response Function: This function investigates the time horizon of variables and their response for any sudden shock in any variable in the model with time passes.

Empirical results

We start the empirical investigation by performing unit root tests to determine whether the series used in the analysis are stationary in levels. We have applied Augmented Dickey-Fuller (ADF) test for the variables under investigation. The test results indicate that all variables are nonstationary at levels and stationary at first differences (results are reported in Table 1). They show that the hypothesis of unit root is not rejected for all the variables at the 5% level of significance. Thus, stock price index and other macroeconomic variables are integrated of the same I(1) order.

Table 1: Augmented-Dickey-Fuller (ADF) Unit Root Test

Variable25	ADF24 Results			
	With intercept		With Trend	
	Level	First Difference	Level	First Difference
SPI	-1.9	-5.9*	-2.0	-5.9*
GDP	1.4	-5.6*	-1.2	-5.68*
CPI	0.9	-4.4*	-1.4	-4.7*
CP	-0.3	-5.1*	-0.3	-5.1*
DR	-2.4	-3.8*	-3.3	-3.8**

*, **, refer to that the null hypotheses that the sires contains a unit root is rejected at1%, and 5%, significance level, respectively[26].

[24] ADF denotes the Augmented Dickey-Fuller (1979) test. The last two equations of the endnote 22 have been used to perform the test. For more details see endnote 22.

[25] *Log transformations*

[26] *The critical values (with time) are: 1%, -4.1; 5%, -3.5; and the asymptotic critical values (with intercept) are: 1%, -3.6; 5%, -2.9. Since the distribution of the ADF statistic is non-standard and requires the use of critical values tabulated by MacKinnon (1996).*

As these series are integrated, our next step is to investigate whether a long-run relationship exists among the variables. This can be found through using different cointegration techniques such as VECM framework.

The results of stationarity analysis presented in the Table 1 show that all the modeled variables are integrated of same order. Therefore, the study then applies the Johansen cointegration tests to explore the long-run relationships among the variables. The results for both Trace statistic and Maximal Eigen statistic tests are reported in Table 2. It is shown that both trace and max-eigenvalue rank tests indicate that cointegration exists among the set of the variables at both 5% and 1% level of significance. It is clearly shown that both trace and maximum-eigenvalue tests suggest at least one cointegration vector. This result suggests that at least one cointegration vector exists among stock market index and other macroeconomic variables. This implies that long run movements of the variables are determined by one equilibrium relationship.

Table 2: Results of Johannes's Cointegration

Hypothesized No. of CE(s)2	Trace Statistic3	5% Critical Value	1% Critical Value
R=0	153.87*	107.35	0.00
R=1	87.08*	79.34	0.01
R=2	54.21	55.25	0.06
R=3	27.56	35.01	0.25
Hypothesized No. of CE(s)	Max-Eigen Statistic4	5% Critical Value	1% Critical Value
R=0	66.79**	43.42	0.00
R=1	32.86	37.16	0.14
R=2	26.66	30.82	0.15
R=3	15.28	24.25	0.47

* Trace test indicates Cointegration at both 5% and 1% levels of significance ** Max-eigenvalue test indicates cointegration at both 5% and 1% levels of significance. The 5% and 1% critical values in the two columns are taken from Osterwald-Lenum (1992).

Lag Order Selection Criteria

The first step in multivariate cointegration analysis is the appropriate lag selection for the variables. For selection of appropriate lag length, the study used two criteria Akaike Information Criteria (AIC) and Schwarz Bayesian Criteria (SBC). The AIC shows the optimal lag of 8, and the SBC selected lag length of 2. In this study, the lag length has been selected using SC and we, therefore, used the optimal lag of 2. (the results are presented in Table 3).

Table 3: VAR Lag Order Selection Criteria[1] on the Length of Lags[27].

Lag	AIC[28]	SC[29]
0	-2.2	-2.0
1	-19.2	-17.3
2	-19.6	-17.9*
3	-19.5	-16.1
4	-19.7	-15.2
5	-20.0	-14.5
6	-19.8	-13.2
7	-19.8	-12.2
8	-20.4*	-11.7

*Indicates lag order selected by the criterion.

Long-run relationship

Following Johansen and Jeselius (1990), the normalised cointegrating equation shows that, in the long run, there is a clear and reliable negative relationship between stock prices and consumer price index, suggest that stock market did not provide hedge against inflation. However, credit of the private sector and interest rate on time deposits are found to have positive and significant effects on the performance of the Jordanian stock market. In addition, real GDP has a strong positive impact of SPI. It is also found that the global financial crisis has insignificant effect on the stock market index.

Table 5: Normalized Cointegrating Coefficients

SPI	CP	CPI	DR	GDP	DUM_CRIS
1	-2.98	19.45	-0.27	-9.39	0.15
S.E	0.78	3.23	0.062	1.86	0.41
t-value	-3.81	6.01	-4.35	-5.03	0.36

The first normalized equation can be constructed as follows:

SPI = 2.98CP -19.45CPI +0.27DR + 9.39GDP -0.15DUM_CRIS

We then proceed our investigation by estimating a VECM model for each set of variables to report the corresponding equation of each VECM associated with the particular stock price index presented in Equation (3). Johansen's maximum likelihood estimation procedure is employed with a specific number of cointegrating vectors imposed. The VECMs provide the correction terms that reflect influences of deviation of the relationship among the variables from long-run equilibrium and short-run parameters.

[27] *For more details on order selection criteria see endnotes 25, 26, and 43.*

[28] AIC denotes Akaike Information Criterion (1974).

[29] *SC denotes Schwartz Information Criterion (1978).*

Table 6: Vector Error Correction Estimates / Short-Run Dynamics

	ΔSPI	ΔCP	ΔCPI	ΔDR	ΔGDP	ΔDUM_CRIS
ECT	-0.01**	-0.01**	0.00*	-0.06**	0.00	0.11
ΔSPI(-1)	0.38*	0.00	0.03**	-0.14	0.00	0.04
ΔSPI(-2)	0.17**	0.00	0.01	0.22	-0.02	0.04
ΔCP(-1)	0.40	0.40*	0.09	0.85	0.12	0.68
ΔCP(-2)	-0.58	0.08	0.03	0.15	-0.14	-0.78
ΔCPI(-1)	0.01	-0.53	0.01	-1.75	0.06	3.14
ΔCPI(-2)	-0.92***	-0.13**	0.05	-0.90	-0.23	2.23**
ΔDR(-1)	0.00	0.02**	-0.01	0.44*	0.00	0.05
ΔDR(-2)	0.00	0.00	0.01	0.22	0.00	0.01
ΔGDP(-1)	1.25	-0.22	0.06	-1.18	0.21*	3.95
ΔGDP(-2)	-0.02	-0.15	-0.13**	-1.15	-0.08	2.37
ΔDUM_CRIS(-1)	-0.07	-0.01	0.04**	0.12	0.00	0.01
ΔDUM_CRIS(-2)	-0.05	0.01	0.01	0.72*	0.00	0.05
R-squared	0.26	0.48	0.25	0.57	0.14	0.48
F	1.81	4.72	1.67	6.74	0.83	4.62

* show the coefficient significantly different from zero at 1 percent probability level.

** show the coefficient significantly different from zero at 5 percent probability level.

*** show the coefficient significantly different from zero at 10 percent probability Level.

The results in Table 6 present the adjustment coefficients for the set of variables used in our investigation along with the short run dynamics. The ECT in DSPI is found to be statistically significant with the anticipated negative sign. The adjustment coefficient associated with the stock price index is -0.01 and statistically significant. This is sufficient to reject any "no cointegration" hypothesis and confirm the presence of a stable long-run relationship between stock price index and other macroeconomic variables. The coefficients of the ECT are also found significant and negative especially for CP, CPI and DR. In addition, the ECT in the global financial crisis equation is insignificant. This confirms the finding in Johansen cointegration test presented previously, suggesting a bi-directional long run relationship between stock price index and credit to the private sector, weighted average interest rate on time deposits, and consumer price index. However, the speed of adjustment to equilibrium is relatively slow in all equations. The evidence implies that an increase in the weighted average

interest rate on time deposits in the banking system has a greater effect on the stock price index than other macroeconomic and financial variables.

Variance Decomposition Analysis (VD)

Usually, there are two methods to widen our investigation and study the effects of shocks to the stock price index. We compute variance decompositions and impulse-response functions, which serve as tools for evaluating the dynamic interactions and strength of causal relations among variables in the system. Table 7 presents the results of the variance decomposition, they are showing that there are significant role played by the shocks in most of macroeconomics variables in accounting for the fluctuations in the stock price index in Jordan.

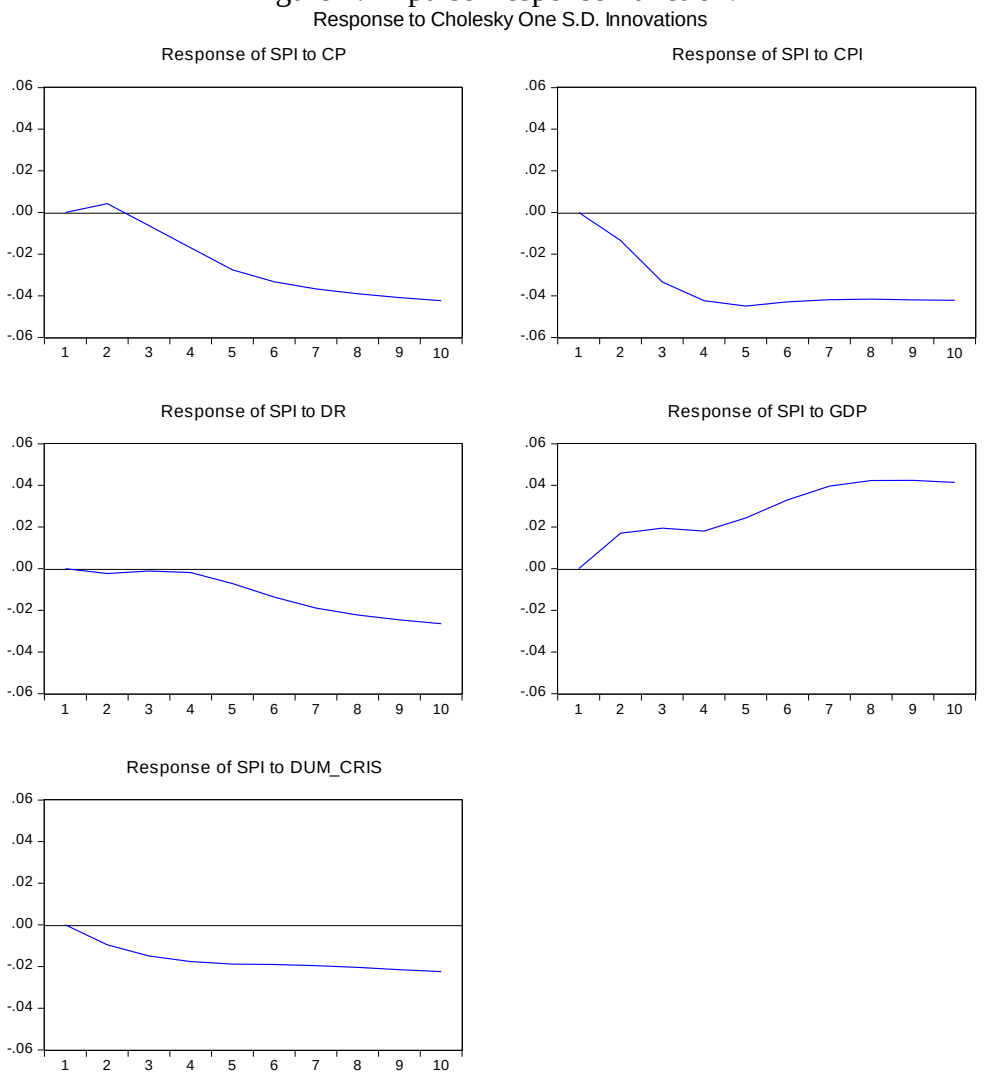
Table 7: Variance Decomposition analysis

Period	S.E.	SPI	CP	CPI	DR	GDP	DUM_CRIS
1	0.1	100.0	0.0	0.0	0.0	0.0	0.0
2	0.2	97.8	0.1	0.7	0.0	1.1	0.3
3	0.2	95.6	0.1	2.5	0.0	1.3	0.6
4	0.3	93.7	0.4	3.8	0.0	1.2	0.8
5	0.3	92.1	1.0	4.6	0.1	1.4	0.9
6	0.4	90.7	1.5	4.8	0.2	1.9	0.9
7	0.4	89.4	2.0	4.9	0.3	2.4	1.0
8	0.5	88.4	2.4	4.9	0.5	2.8	1.0
9	0.5	87.5	2.7	4.9	0.7	3.2	1.0
10	0.5	86.8	3.0	4.9	0.8	3.4	1.1

Impulse Response Function (IRF)

On the other hand, Figure 1 below shows the impulse response functions. This function can produce the time path of dependent variable (SPI), in the system of equation developed within the VECM framework, to shocks from all the explanatory variables. The figures show that the system of equations used in the previous analysis is relatively stable. They demonstrate the positive and negative reaction of each variable to the SPI. The results here confirm the ones in the VECM estimates.

Figure 1: Impulse Response Function:



Conclusion

This paper has examined the inter-linkage between the Amman Stock Exchange (ASE) price index and five macroeconomic variables, namely, real gross demotic product (GDP), inflation, credit to privet sector, weighted average interest rate on time deposit, and dummy variable explaining the global financial crises period using Johansen's cointegration test and VECM framework. The study used a quarterly data from covering the period 1992:Q1-20014:Q1 which are obtained from Central Bank of Jordan (CBJ) website. The empirical results of Johansen cointegration test have indicated that there is at least one cointegrating vector among stock market index and the main macroeconomic variables in Jordan. The findings of the study have

showed that the speed of adjustment in the VECM is significant and relatively slow. This implies that long run movements of the variables are determined by one equilibrium relationship. The results also indicate that there is a bi-directional long run relationship between stock price index and credit to the private sector, weighted average interest rate on time deposits, and consumer price index. The evidence implies that an increase in the weighted average interest rate on time deposits in the banking system has a greater effect on the stock price index than other macroeconomic and financial variables.

References:

Ahmed, S. (2008). Aggregate Economic Variables and Stock Market in India, *International Research Journal of Finance and Economics*, (14): 14-64.

Akbar, M., Ali, S., and Khan, M. F. (2012). The Relationship of Stock Prices and Macroeconomic Variables revisited: Evidence from Karachi Stock Exchange, *African Journal of Business Management*, 6 (4): 1315-1322.

Altay, E. (2003). The effect of macroeconomic factors on asset returns: a comparative analysis of the German and the Turkish stock markets in an APT Framework. MartinLuther-Universität Halle, Betriebswirtschaftliche Diskussionsbeiträge, (48)/2003.

Al-shubiri f.n.(2013), Analysis of The Relationship Between Economic Forces And Abnormal Stock Return: Empirical Evidence, *Polish Journal Of Management Studies*, Vol.8.

Asaolu, T. O. and Ogunmuyiwa, M.S. (2011). An Econometric Analysis of the Impact of Macroecomomic Variables on Stock Market Movement in Nigeria, *Asian Journal of Business Management*, 3 (1): 72-78.

Attari, Muhammad and Safdar, Luqman (2013), The Relationship between Macroeconomic Volatility and the Stock Market Volatility: Empirical Evidence from Pakistan, Pakistan Journal of Commerce and Social Sciences 2013, Vol. 7 (2), 309-320.

Brahmasrene T., K.(2007)" Jiranyakul. Cointegration and causality between stock index and macroeconomic variables in an emerging market, *Academy of Accounting and Financial Studies Journal*, (11), 17- 30.

Chen et al. (1986), Economic Forecast And Stock Market, *The Journal Of Business*, ,(59)3: 383-403.

Fama, E. F. (1981), Stock returns, real activity, inflation and money. *The American Economic Review*, (71): 545-65.

Gan, C., Lee, M., Yong, H. and Zhang, J. (2006). Macroeconomic Variables and Stock Market Interactions: New Zealand Evidence. *Investment Management and Financial Innovations*, 3 (4): 89-101.

Johansen, S. and K. Juselius (1990). "Maximum likelihood estimation and inference on cointegration with applications to the demand for money." *Oxford Bulletin of Economics and statistics* 52(2): 169-210.
Maysami, R.C., Howe, L.C. and Hamaz, M.A. (2004), Relationship between Macroeconomic Variables and Stock Market Indices: Cointegration Evidence from Stock Exchange of Singapore's All-S Sector Indices, *Journal Penguruson*, 24: 47-77.

Mookerjee, R. and Yu, Q. (1997). Macroeconomic Variables and Stock Prices in small Open Economy: The case of Singapore, *Pacific-Basin Finance Journal*, 5: 377-788.
Mukherjee, T.K. and Naka, A. (1995). Dynamic relations between Macroeconomic Variables and the Japanese Stock Market: An application of a Vector Error Correction Model, *The Journal of Financial Research*, 2: 223-237.
NAIK, Pramod Kumar and PADHI, Puja (2012) The Impact of Macroeconomic Fundamentals on Stock Prices Revisited: Evidence from Indian Data, Eurasian *Journal of Business and Economics*, 5 (10), 25-44
Pal, K. and Mittal, R. (2011). Impact of Macroeconomic Indicators on Indian Indian Capital Markets, Journal of Risk Finance, 12 (2): 84-97.
Pethe, A. and Karnik, A. (2000). Do Indian Stock Market Maters? Stock Market Indices and Macroeconomic Variables, *Economic and Political Weekly*, 35 (5): 349-356.
Rahman, A. Abdul, Noor, Z. Mohd Sidek and Fauziah H. T. (2009). Macroeconomic Determinants of Malaysian Stock Market, *African Journal of Business Management*, 3 (3): 95-106.
Ratanapakorn, O. and Sharma, S. C. (2007). Dynamics analysis between the US Stock Return and the Macroeconomics Variables, *Applied Financial Economics*, 17 (4): 369-377.
Ray, P. and Vani, V. (2003). What moves Indian Stock Market: A study on a linkage with Real Economy in the post reform era, *Working Paper*, National Institute of Management, Kolkata, 1-19.
Robert, D.G. (2008). Effect of Macroeconomic Variables on Stock Market Returns for four Emerging Economies: Brazil, Russia, India and China. *International Business & Economics Research Journal*, 7 (3): 1-8.
sohail, nadeem and hussain, zakir , long-run and short-run relationship between macroeconomic variables and stock prices in pakistan the case of lahore stock exchange, pakistan economic and social review, volume 47, no. 2 (winter 2009), pp. 183-198
Wongbampo, P. and Sharma, S.C. (2002). Stock Market and Macroeconomic Fundamental Dynamic Interactions: ASEAN-5 Countries. *Journal of Asian Economics*, 13: 27-51.

APPENDIX

Table 1A: Descriptive Analysis[30]

	SPI	GDP	CPI	CP	DR	DUM_CRISIS
Mean	7.5	7.4	4.5	8.6	1.7	0.8
Median	7.4	7.3	4.5	8.4	1.7	1.0
Maximum	8.4	8.1	5.0	9.7	2.2	1.0
Minimum	6.7	6.9	4.2	7.6	0.9	0.0
Std. Dev.	0.4	0.3	0.2	0.6	0.4	0.4
Skewness	0.22	0.20	0.42	0.29	-0.37	-1.17
Kurtosis	2.55	1.70	2.00	1.75	2.02	2.37
Jarque-Bera	1.5	6.9	6.3	7.0	5.6	21.8
Probability	0.471	0.032	0.042	0.030	0.060	0.000

[30] Summary Statistics of the Natural Logarithm of Stock Price Index (SPI), Natural Logarithm of Real Gross Domestic Product (GDP), Natural Logarithm of Consumer Price Index (CPI), Natural Logarithm of Credit Facilities Extended by Licenced Banks to Private Sector (Resident), Weighted Average Interest Rate on Time Deposits (DR), and Dummy variable denote to global financial crisis 1992:Q1-2014:Q1(all variable adjusted for seasonal adjustment using X-12 approach).

Figure 1A Plot of the Sample Series, 1992:Q1-2014:Q1.