# The Relationship between Macroeconomic Variables and Stock Market Returns : A Case of Jordan for the Period 1993-2013

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## Abstract

*The aim of this study is to investigate the relationship between macroeconomic factors on Amman Stock Market Exchange(ASE) Returns, by employing quarterly data between (1993:3and 2013:9). This study uses six macroeconomic factors:Real money supply RM2 (MS), real gross domestic product (RGDP), weighted average interest rates on loans and advances (WAIR), Jordanian Worker's Remittances (WRMIT), Internal public loan (IPL), Consumer Prıce Index (CPI).The normality test and unit root tests applied to the data. Also, ARCH /GARCH models utilized. The results reveal that out of the six macroeconomic variables employed money supply, Internal public loan, weighted average interest rates on loans and advances, Jordanian Worker's Remittances and Consumer Prıce Index exert strong significant influence on stock returns. Consumer Prıce Index and Jordanian Worker's Remittances have a positive significant impact, while Real money supply, real gross domestic product, weighted average interest rates on loans and Internal public loan have a negative significant impact. On the other hand, real gross domestic product exert no significant influence on stock returns in Jordan.*

**Keywords:** Macroeconomic Variables, ARCH,GARCH

## *1. Introduction*

A number of researchers have investigated the impact of macroeconomic variables on stock Returns over the last few decades ( Fama, 1981; Friedman, 1988; Ke ran, 1971, Nelson,1976,etc).

Number of the article has been extensivelly studied in developed capital markets date back to 1970s.

Interest in this area is mainly because stock market has been recognized to have a prominent role in a country's macroeconomic development.

Theoretically, stock market should be closely related with the macroeconomic variables of the country, simply because stock prices are the discounted present value of expected future cash flows. Based on a simple discount model, the fundamental value of a corporate stock is equal to the present value of expected future dividends, thus the future dividend must eventually reflect the real economy activity. Similarly, the volatility of stock prices should also depend on the volatility of expected future cash flows and future discount rates. Since the value of corporate equity at the aggregate level depend on the state of economic activity, it is likely that any changes in the level of uncertainty of future macroeconomic conditions would cause a change in stock return volatility. In other words, stock markets may be volatile simply because real economic activities fluctuate . Zakaria, Shamsuddin (2012).

The attack on the conclusions drawn from the Efficient Market Hypothesis (EMH) includes early studies by Fama and Schwert (1977) affirming that macroeconomic variables influence stock returns.

The relationship has been examined in Emerging Stock Markets after 1980s (Menike 2006). However ,interest in investing in emerging markets has grown considerably over the past decade. Harvey (1995a) shows that returns and risks in emerging stock markets have been found to be higher, relative to developed markets.

All the researchs done in order to identify the relation between macroeconomic variables and stock return, The estimation of future trends of macroeconomic variables can be helpful in seeing the leading direction of stock returns.

It is often believed that the stock return is determined by a number of fundamental macroeconomic variables such as interest rate, industrial production,money supply, inflation rate, and a good number of studies have captured the effects of macroeconomic variables on stock returns for different countries. Existing theories offer different models that make available framework for examining the relationship between stock return and macroeconomic variables (Quadir, 2012). However, interest in investing in emerging markets has grown considerably over the past decade. Harvey (1995a) shows that returns and risks in emerging stock markets have been found to be higher, relative to developed markets.

This study analyzes the relationship between sex macroeconomic factors on stock market returns of Amman Stock Exchange (ASE) from the time period of 1993:3 to 2013:9.

The rest of this paper is organized as follows: section 2 reviews several previous studies on the relationship between stock market and macroeconomic variable; section 3 provides a methodology used in this study and data; in Section 4, the empirical results are presented; and followed by the conclusion in Section 5.

## *2. Literature Review*

The relationship between stock market price and macroeconomic variables has been studied extensively especially in the case of developed economies, several studies also have been executed for emerging markets, and the literature dates back to the late 1970s.

Nelson (1976) examined the relationship between monthly stock returns and inflation from 1953 to 1974 using US data, and he found a negative relationship between stock returns, in both expected and unexpected inflation.
Fama (1981, 1982), Fama and Schwert (1977), Geske and Roll (1983) empirically find that stock returns are negatively affected by both expected and unexpected inflation.

Chen et al. (1986) used some macroeconomic variables to explain stock returns in the US stock markets, founded that the set of macroeconomic variables which can significantly explain stock returns includes growth in industrial production, changes in the risk premium, twists in the yield curve, while both the anticipated and unanticipated inflation rates were negatively related to the expected stock returns.

Lee (1992) found that stock returns assist to explain the real economic activity; however, stock returns demonstrate little about the variation in inflation, through analyzed the causal relationships and dynamic interactions among asset returns, real economic activity, and inflation in the postwar US using a VAR approach .
Maysami and Koh (2000) inspect the relations between macroeconomic variables (exchange rate, long and short term interest rates, inflation, money supply, domestic exports, and industrial production) and Singapore stock markets using the vector error correction model which covered the period from 1988 to 1995.They found that inflation, money supply growth, changes in short- and long-term interest rate and variations in exchange rate formed a cointegrating relation with changes in Singapore's stock market levels.

Maghyereh (2002) investigated the long-run relationship between the Jordanian stock prices and selected macroeconomic variables, by using monthly time series data for (January 1987 to December 2000). The results indicate that macroeconomic variables reflect in stock prices
in the Jordanian capital market.

Islam & Watanapalachaikul (2003) present a strong, significant long-run relationship between stock prices and macroeconomic factors (interest rate, bonds price, foreign exchange rate, price-earning ratio, market capitalisation and consumer price index) during 1992-2001 in Thailand.

Gan, Lee, Yong and Zhang (2006) findings suggest that there exist a long term relationship between stock prices and macroeconomic variables in New Zealand. However, the Granger causality test suggests that New Zealand stock exchange is not a good indicator for macroeconomic variables in New Zealand, this result however, is inconsistent with other studies.

More recently, Wang (2011) inspect the time-series relationship between stock market volatility and macroeconomic variable volatility for China using E-GARCH and lag-augmented VAR models.

He found evidence on the existence of a bilateral relationship between inflation and stock prices, and a unidirectional relationship between the interest rate and stock prices.

Chinzara (2011) examine the relationship between macroeconomic uncertainty and stock market volatility for South Africa and found that stock market volatility is significantly affected by macroeconomic uncertainty.
It's worth to mention that the previous studies referred to did not includes the variable internal public loan as a factor effect on stock market return especially in our country Jordan, so that our study is different from the previous studies in its methodology as well as it deal with new factor that may be effect on stock market returns.

## *3. Data and Research Methodology*

### 3.1 Data Source

The empirical analysis is carried out by using quarterly data. The sample period spans from March 1993 to Sep 2013, and the study was carried out by using76 quarterly observations, the time series data for study were sourced from Central Bank of Jordan (CBJ), Statistical Bulletin. Macroeconomic data used in this study includes; Amman Stock Market Returns(ASMR), Consumer Price Index (CPI), money Supply M2(MS),Weighted Average Interest Rates on Loans and Advances (WAIR), Gross Domestic Product At Current Prices( RGDP), Workers Remittances (WRMIT), Internal Public Loan (IPL). Amman Stock Market Returns (SMR) represents the dependent variable while the other variables are the independent one.

### 3.2 Macroeconomic Variables Definitions

This section provides a simple description of the variables used in the model, which is used in the empirical investigation of the relationship between stock returns and macroeconomic variables.

#### 3.2.1 Amman Stock Market Returns (ASMR)

Amman Stock Exchange (ASE), All Share Index was used as a proxy for Amman stock market returns (ASMR), the all share index is a broad market indicator of the stock market, which measures the overall performance of the stock market and was specified as the dependent variable.

The quarterly rate of return of real General Price Indices of Amman stock exchange at the current quart is calculated by the following formula:

$$QIR_t = Ln(P_t / P_{t-1})$$

Where $QIR$ is a Quarterly Index Returns, $P_t$ is the general price index for the quart $t$, $P_{t-1}$ is the general price index for the quart $t-1$.

#### 3.2.2 Consumer Price Index (CPI)

Measures the general price level of a fixed basket of goods and services consumed by the Jordanian family (851 commodities and services), including those imported from abroad. It is prepared by the Department of Statistics and weighted by the average family expenditure on goods and services, acquired from the results of Household Expenditure and Income Survey carried out in 2006.

Inflation is being captured be consumer price index. Rising inflation increases the cost of living and shifts resources from investments to consumption. This brings about a fall in demand for securities, which in return leads to reduction in the volume of stock traded. Also the monetary policy responds to the increase in the rate of inflation in the absence of flexible production system to respond to the request of money supply, which in turn increases the nominal risk – free rate and hence, raises the discount rate which results in reduction of present value of cash flows so it is said that an increase in inflation is negatively related to stock prices.

$CPI_t$: is the quart-end of consumer price index.

$CPI_t = Ln(CPI_t / CPI_{t-1})$, $QCPI_t$ quarterly growth rate of consumer price index, $Ln$: is the natural logarithm.

#### 3.2.3 Money Supply M2 (MS)

Money Supply is used as a proxy of money supply. Increase in money supply leads to increase in liquidity that in the end results in upward movement of nominal stock prices.

$MS_t$: is the quart-end of real money supply (M2) broad definition.

$QMS_t = Ln(MS_t / MS_{t-1})$, $QMS_t$ quarterly growth rate of real money supply, $Ln$: is the natural logarithm.

**3.2.4 Weighted Average Interest Rates on Loans and Advances (WAIR)**

$WAIR_t$: is the quart-end of weighted average interest rate on loans and advances.

$QWAIR_t = Ln(WAIR_t / WAIR_{t-1})$, $QWAIR_t$ quarterly growth rate of weighted average interest rate on loans and advances, $Ln$: is the natural logarithm.

According to the conventional model the higher interest rate lead to a decline in stock prices, and vice versa, as long as the interest rate is the discount rate that is used to calculate the current of the market return. The interest rate affect the market return because it represent an alternative for investor to in invest his money.

**3.2.5 Gross Domestic Product at Current Prices (RGDP)**

$RGDP_t$: is the quart-end of gross domestic product.

$QRGDP_t = Ln(RGDP_t / RGDP_{t-1})$, $QRGDP_t$ quarterly growth rate of gross domestic product, $Ln$: is the natural logarithm.

The GDP could have a positive or a negative impact, in the case of the unexpected increase of this variable will lead to increased optimism about the future which increase the volume of the share and as a result an increase in the market return, but if led the project increase the rate of inflation and interest rate increases rate of required rate of return on investment all of that adversely affect market reurn.

**3.2.6 Workers Remittances (WRMIT)**

$WRMIT_t$: is the quart-end of workers remittances.

$QWRMIT_t = Ln(WRMIT_t / WRMIT_{t-1})$, $QIPL_t$ quarterly growth rate of workers remittances, $Ln$: is the natural logarithm.

Is expected to result in increased WRMIT to increase the volume of investment , is also expected to from part of these transfers will go to invest in financial market, lead to increase demand for stock and as a result an increase in the market return.

**3.2.7 Internal Public Loan (IPL)**

$IPL_t$: is the quart-end of internal public loan.

$QIPL_t = Ln(IPL_t / IPL_{t-1})$, $QRGDP_t$ quarterly growth rate of internal public loan, $Ln$: is the natural logarithm.

When the expected increase in IPL by issuing more government bonds with investment free or little risk with a good return . it will lead to the absorption of the the investments toward this variable which effect negatively on the market return , this is logical explanation for a negative relationship between the two variables.

**3.3 Methodolgy**

Augmented Dickey Fuller (Dickey and Fuller, 1979) test is applied to examine the stationary of a data that is time series in nature.

The numbers of lags were decided in reference to the Akaike Information Criterion to eliminate residual autocorrelation in the quarterly data.

Augmented Dickey Fuller stationary technique is applied with having differencing at first level to convert data in stationary. As the data is time series in nature

$$\Delta Y_t = \mu + \beta Y_{t-1} \sum_{j=1}^{p} \alpha_j \Delta Y_{t-j} + \varepsilon_t \qquad (1)$$

Where β is the coefficient on a time trend, α is a constant and *p* the lag order of the autoregressive process.

There is many studies used the Autoregressive Conditional Heteroskedasticity (ARCH) model, and has now become widely used in modeling the behavior of financial time series. One of the main advantages of ARCH models is its ability to capture the non- linearity and volatility clustering in stock return data.

Also, ARCH models study the second moment (Conditional and non-conditional) of the time series, and thus allow the variance of a series to depend on the available information set.

This model was later extended by Engle and Bollerslev (1986) to the Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model which incorporates the lagged values of conditional variance and therefore is able to capture the leptokurtosis, skewness, and volatility clustering in the time series data. The GARCH methodology also takes into account past variances in explaining future variances, and therefore when the data suffers from heteroscedasticity, the expected value of the error term is not constant. Furthermore, all ARCH/GARCH models explain the importance of the degree of persistence of shocks to volatility in returns and macroeconomic variables. These models are also useful in examining the simultaneous interaction among stock market returns and variation in macroeconomic factors.

Investigation of conditional variance model on Stock markets behavior is recently examined by a large number of studied. Autoregressive conditional Heteroscedasticity (ARCH) model, is employed to examine time varying risk. Model's mean equation is shown by an AR (p) process. The lagged value of the squared error term that is obtained from the mean equation and the conditional variance is regressed on constant. The return series is regressed on its past values.

The estimation of a GARCH model involves the joint estimation of a mean and a conditional variance equation. The GARCH (1,1) model is stated as follows:

$$Y_t = \phi_0 + \sum_{i=1}^{k} \phi_i Y_{t-i} + u_t \qquad u_t \sim N(0, \delta_t^2) \tag{2}$$

$$\delta_t^2 = \phi + \sum_{i=1}^{q} \alpha_i u_{t-i}^2 + \sum_{j=1}^{p} \beta_i \delta_{t-j}^2 \tag{3}$$

The estimation of GARCH model involves the joint estimation of a mean and conditional variance equation. Equation (2), the conditional mean equation, is an autoregressive process of order $k$ (AR(k)). Parameter $\phi_0$ is the constant, $k$ is the lag length, $u_t$ is the heteroskedastic error term with its conditional variance. Equation (3) is the conditional variance equation specified as the GARCH (p,q) model where $p$ is the number of ARCH terms, and $q$ is the number of GARCH terms.

Several literature shows that (for instance, study by Baillie and DeGennaro, 1990; Bera and Higgins, 1993; Floros, 2009, among others), a simple GARCH model is parsimonious and generally gives significant results. Therefore, this paper will use GARCH(1,1) models to to investigate the impact of macroeconomic factors on Amman Stock Market Returns (ASMR), these macroeconomic variables are (Consumer Price Index (CPI), money Supply M2(MS),Weighted Average Interest Rates on Loans and Advances (WAIR), Gross Domestic Product At Current Prices( RGDP), Workers Remittances (WRMIT), Internal Public Loan (IPL).) being studied.

## *4. Empirical Results*

Firstly we are looking to the relationship between the rate of return of the (ASE) index and selected macroeconomic variables have been examined through various descriptive statistics analysis, and in order to test the stationarity of the variables by using the Augmented Dickey Fuller test.

Table (1) describe the statistical data, also the probabilities (p-values) are used in order to provide evidence whether to reject the null hypothesis of the normality for the unconditional distribution of the quarterly rate of return.

**Table (1) Descriptive statistics for Amman stock market returns**

| | ASMR | CPI | MS | WAIR | WRMIT | RGDP | IPL |
|---|---|---|---|---|---|---|---|
| **Mean** | 0.0144 | 0.008845 | -32.6303 | -0.12848 | -0.01163 | .015048 | 0.032899 |
| **Median** | 0.0030 | 0.007261 | 25.4000 | .010000 | .007752 | .014124 | .036000 |
| **Maximum** | 0.3248 | 0.065451 | 69.4000 | .720000 | .606289 | .279279 | .328000 |
| **Minimum** | -0.3485 | 0.041411 | -17742.1 | -8.95000 | -2.37519 | -4.17534 | -0.33300 |
| **Std. Dev.** | 0.1086 | 0.016843 | 025.368 | .035575 | .391622 | 0.680254 | .096114 |
| **Skewness** | 0.3754 | 0.640269 | -8.62077 | -7.95661 | -2.83357 | 0.162064 | -0.18222 |
| **Kurtosis** | 4.7426 | 5.569353 | 5.90160 | 8.38877 | 8.17485 | 8.74726 | .055048 |
| **Jarque-bera** | 11.8515 | 7.12778 | 8472.55 | 4907.70 | 63.7095 | 206.657 | 31.1593 |
| **Probability** | 0.0026 | .000001 | 0.000000 | .000000 | .000000 | .000000 | 0.000000 |
| **Observations** | 79 | 79 | 79 | 79 | 79 | 79 | 79 |

Table 1 results show that the variables are normally distributed and highly skewed, including the Amman stock price index (ASE) which is significantly skewed to the right and has an excess kurtosis (deviated from 3), and the series are leptokurtic. While, MS,WAIR,WRMIT, and IPL are skewed to the left. High levels of kurtosis the normality test is applied through using the Jarque-Bera test, and based on the sample kurtosis and skewness. Based on the Jarque-Bera statistics and p-values, this assumption is rejected at 1% significant level. Subsequently, We can state that there is no randomness in the data.

**Table 2. Ljung-box Q-statistics for Amman stock market returns**

| LAG | AC | PAC | Q-Stat | Prob |
|---|---|---|---|---|
| **1** | 0.388 | 0.388 | 12.327 | 0.000 |
| **2** | 0.136 | -0.017 | 13.859 | 0.001 |
| **3** | -0.028 | -0.088 | 13.925 | 0.003 |
| **4** | -0.149 | -0.126 | 15.821 | 0.003 |
| **5** | 0.093 | 0.247 | 16.570 | 0.005 |
| **6** | 0.002 | -0.127 | 16.571 | 0.011 |
| **7** | -0.001 | -0.010 | 16.571 | 0.020 |
| **8** | -0.021 | -0.025 | 16.611 | 0.034 |
| **9** | -0.028 | 0.068 | 16.684 | 0.054 |
| **10** | 0.173 | 0.157 | 19.449 | 0.035 |

Table (2) confirms through using the Ljung-Box Q-statistics associated with the ACF coefficients of the raw stock market returns and, this rejects the null hypothesis of no autocorrelation up to one-fourth of the years .This may be seen as evidence for the presence of ARCH effect or volatility clustering, which can be interpreted as a sign of long-range dependence in Amman stock market returns during the sample period. This reveals that stock returns are not normally distributed (Mandelbrot, 1963 and Fama, 1965).

**Table (3).The Results of Unit Root Test for (ASMR &Macroeconomic Variables)**

| Variables | ADF Unit Root Test | PP Unit Root Test | Akaike Information Criterion (AIC) | Durbin-Watson Stat |
|---|---|---|---|---|
| **ASMR** | -5.01158* | -5.72841* | -1.71571 | 1.922707 |
| **CPI** | -5.97763* | -8.93937* | -5.27979 | 1.996858 |
| **MS** | -3.94708* | -9.83448* | -5.4141 | 1.951553 |
| **RGDP** | -4.91785* | -19.9732* | 1.827389 | 2.330312 |
| **IPL** | -4.13073* | -10.1343* | -1.82733 | 1.856909 |
| **WAIR** | -2.71422* | -7.96281* | -4.53607 | 2.085153 |
| **WRMIT** | -6.69517* | -12.8071* | 0.887248 | 1.990388 |

Unit root test and Augmented Dickey Fuller test Variables at first difference in natural logarithm without Intercept and Trend.

Notes:
1. Asterisk (*) shows the rejection of the null hypothesis of non-stationary at the 1% level.
2. MacKinnon (1996) critical values are used for ADF and PP tests (At first difference in natural logarithm without Intercept and Trend). The 1%, 5% & 10% critical value for the ADF and PP tests is -2.5742 and -1.9410and -1.6164 respectively.

Table (3) show the results of unit root tests through ADF, and PP. The null hypothesis of the existence of a unit root are lying in the rejection of the null area and therefore is rejected at 1% significance level in both the ADF and PP tests, since the test statistics are more negative than the calculated critical values. Moreover, the Durbin-Watson statistics indicates there is no evidence of autocorrelation in all series.

From all the above results all of the data series are stationary, we can now continue to estimate the influence of macroeconomic factors on Amman stock market return , through employing the ARCH/GARCH models.

In literature many studies examined the relationship between stock market prices and many macroeconomic factors and show a mixture of findings. The findings of these studies depend on the extent of these studies. So that, we can't generalize the outcomes because of the different market environment & background. Every market possesses different rules, regulations, investors, and other features. With regards to this study; all variables indicate that they are stationary, lending continuity in the modeling process. Therefore, the influence of macroeconomic factors on the (ASMR) is estimated utilizing ARCH/GARCH estimation model.

**Table (4) The effect of macroeconomic variables on Amman Stock Market Return is examined by Method: ML – ARCH (1)/ GARCH (1) estimation for the period: (1993:3 - 2013:9 ). Dependent Variable: SMR**

| **Dependent Variable: ASMR** | | | | |
|---|---|---|---|---|
| **Method: ML - ARCH** | | | | |
| **Date: 01/10/14 Time: 18:22** | | | | |
| **Sample: 1993:3 2012:9** | | | | |
| **Included observations: 79** | | | | |
| **Convergence not achieved after 500 iterations** | | | | |
| | **Coefficient** | **Std. Error** | **z-Statistic** | **Prob.** |
| | | | | |
| **C** | -9265.373 | 5264.292 | -1.76004 | 0.0784 |
| **MS** | -0.926367 | 0.505339 | -1.83316 | 0.0668 |
| **IBL** | -0.834115 | 0.333579 | -2.5005 | 0.0124 |
| **CPI** | 352.8869 | 97.67708 | 3.612791 | 0.0003 |
| **WRMIT** | 5.468563 | 3.262646 | 1.676113 | 0.0937 |
| **WAIR** | -1271.459 | 234.7741 | -5.41567 | 0 |
| **RGDP** | -0.006184 | 0.187997 | -0.03289 | 0.9738 |
| | | | | |
| | **Variance Equation** | | | |
| | | | | |
| **C** | 1019825 | 350711.5 | 2.907873 | 0.0036 |
| **ARCH(1)** | 0.75805 | 0.511903 | 1.480847 | 0.1386 |
| **GARCH(1)** | -0.219286 | 0.065018 | -3.37268 | 0.0007 |
| | | | | |
| **R-squared** | 0.805862 | **Mean dependent var** | | 2605.988 |
| **Adjusted R-squared** | 0.78054 | **S.D. dependent var** | | 2979.863 |
| **S.E. of regression** | 1395.963 | **Akaike info criterion** | | 16.95714 |
| **Sum squared resid** | 1.34E+08 | **Schwarz criterion** | | 17.25707 |
| **Log likelihood** | -659.807 | **F-statistic** | | 31.82424 |
| **Durbin-Watson stat** | 0.373265 | **Prob(F-statistic)** | | 0 |

The estimated results, using ARCH/ GARCH were performed. The value related to the lagged squared error term is positive & significant at 1% level, which satisfies the specification requirement of the model. On the other hand, GARCH (1, 1) which incorporates the coefficient of the lagged variance term is found to be negative, and statistically significant. Therefore, the extension of GARCH (1, 1) seems necessary.

However, the results of this study based on the GARCH (1,1) estimation as showed in table (5) indicate that money supply (MS) has an inverse impact on the ASMR .The negative value of the coefficient is (-0.926367) and significant & consistent with, Fama (1981) and Jensen et. al ( 1996), Mukherjee and Naka (1995), Maysami and Koh (2000) and, Wongbangpo and Sharma (2002), and internal public loan (IBL) has an inverse impact also on the ASMR .The negative value of the coefficient is ( -0.834115) and significant.

Our findings also confirmed a significant positive relation between the ASMR and CPI, this is inconsistent with Chen et al (1986), Mukherjee & Naka (1995).

Our finding support a significant positive relation between the ASMR and WRMIT.
Our study indicates a significant inverse relationship between interest rates (WAIR), and ASMR. However, the result is consistent with Choi& Jen (1991), Maysami & Koh (2000), Al-Sharkas (2004), Kandir (2008).

The results show also a negative impact of RGDP on the ASMR and the coefficient is (-0.006184) and highly insignificant. This is an opposite with the studies of Geske and Roll (1983), Chen, Roll and Ross (1986), Fama (1990), Kearney and Daly (1998), and Maysami & Koh (2000) Maghayereh (2002),Al-Sharkas (2004).

The sum of the ARCH and GARCH coefficients is less than one, which reveals that the unconditional variance is stationary. Since the sum of $\alpha + \beta$ is averagely close to one, the time-varying volatility of the Amman stock market returns is moderately persistent. In other words, a shock to the Amman stock market volatility will not last too long. That is, there is a mean reverting variance process. The $\alpha$ is larger than $\beta$, which implies that the volatility of the stock market is affected by economic news more than the past volatility .

## *5. Summary and Conclusions*

This study tested the relationship between six macroeconomic factors and the market return in Amman Stock Exchange for the period 1993:3- 2013:9 through GARCH test model to estimate the relationship between market return and a range of important economic variable that explain and justify the behavior of stock return .

Based on the estimation model adopted in this study show that one of the six macroeconomic variables that were selected for analysis on basis of GARCH-mean equation, money supply, Consumer Prıce Index, Internal public loan, weighted average interest rates on loans and advances and Jordanian Worker's Remittances exert strong significant influence on stock returns while real gross domestic product exert no significant influence on stock returns in Jordan. The significant impact of the estimated coefficient, $\beta_1$ of the time varying conditional variance indicates that volatility exert a negative impact on Amman stock market returns in the period under review. That is, there seems to be evidence of a GARCH-in-mean effect in the model. However, the evidence on the volatility of the conditional variance.

On the GARCH-variance equation, the volatility of the Amman stock market is affected by economic news more than the past volatility .

The set of macroeconomic variables were used in this study, may be Some other macroeconomic variables would provide more information about the stock returns volatility. This study also suggests some future studies that incorporate other macroeconomic variables other than the ones used in this study to enhance the understanding about the dynamics of the stock market returns in less developed countries.

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