INFLUENCE OF INTEREST RATE, EXCHANGE RATE AND INFLATION ON COMMON STOCK RETURNS OF AMMAN STOCK EXCHANGE, JORDAN

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Abstract

This research covers the influence of interest rate, exchange rate and inflation on stock returns of ASE Free float index. The three macro variables which are taken under consideration are deemed very major for the economy of any country. Therefore, any change among these variables consequence the economy in different ways. Thus, the authoritarian takes step in order to make adjusts in their rules which can involve the economy in a positive way. Ten years monthly data from 2005 to 2015 is taken in contemplation. Multiple regression models are applied on the data where result shows that firms are negatively correlated to interest rate and positively correlated to inflation with zero relationship with exchange rate and stock returns. Also, R square shows a weak relationship between independent and dependent variables.

Keywords: Interest rate, Exchange rate, Inflation, ASE index, Stock returns

INTRODUCTION

Macroeconomic variables influence the performance of the stock market. Investors think about macroeconomic variables when they value stocks. Interest rate, exchange rate and inflation are very essential amongst these macroeconomic variables which affect the performance of the stock market. Interest rate is contrariwise interrelated to stock prices as well as exchange rate.

Interest rate is defined as the cost of borrowing. Also it used as a discount rate to discount future cash flows of the financial assets. Increase in interest rate give rise to decrease in stock prices because the required rate of return on stocks increase which causes decrease in stock prices (Lobo, 2000).

There is also a relationship between Exchange rate and stock market. So, foreign investors exchange their returns on stocks in to their own currency. Foreign investors get affected when local currency gets stronger and thus changed into weaker currency. Moreover, exchange rate has negative relationship with stock prices. Therefore, stock prices diminish when exchange rates boost and a decrease in exchange rate has positive impact on stock market (Khan, *et al.*, 2012).

A fast boost in inflation also involves negatively the performance of the stock market. Growing inflation deemed as a bad news by the investors because it represents bad economic conditions in the country. Therefore, investors are lacking confidence about their investment in the stock market. In case of declining inflation rate, it illustrates good economic conditions and catches the attention of investors to invest in the stock market (Khan, *et al.*, 2012).

On top the discussion of interest rate, exchange rate and inflation have relationship with stock prices. This study will be accomplished to test this relationship empirically. For this purpose a case of Amman stock exchange (ASE) will be selected.

Amman Stock Exchange Market (ASE)

The Amman Stock Exchange (ASE) is an emerging stock market since its setting up on the 1st of January, 1978. The ASE has contacts with the neighboring Arab stock markets. It is greatly reliant on foreign capital inflows (deposition; and foreign investment), which consequently improved the portfolio diversification and support products and liquidity. The Amman stock market is experienced notable developments in rapid economic growth. This may be due to the execution of the new Electronic Trading System (ETS). That's why measures the effect of inflation, interest rate and exchange rate on stock prices in emerging markets have more than a few features as: being more elusive, more volatile, often accompanied by thin trading-volumes and it is vulnerable to more handling compared to mature markets (Assaleh *et al.*, 2011).

ASE was established in March 11-1999 as a result of the reformation process of the Jordan Capital Market. It is described as a non-profit, private organization with administrative and financial independency, authorized to exchange trading securities. In addition, ASE is an efficient market for trading securities, hence it offers an attractive and safe environment for investment, develops processes and systems of trading securities in the stock market, meets

the newest international standards, and publishes trading information to the largest possible number of participants. Then in 1997 the Law, No.23 was issued as a turning point for the Jordanian capital market. The Law offered three new institutions to replace AFM which are:

1. Jordan Securities Commission (JSC)
2. Amman Stock Exchange (ASE)
3. Securities Depository Center (SDC)

JSC is responsible of identifying regulations and monitoring the market and SDC is responsible of managing settlements and maintenance of ownership records. In fact, ASE is one of the largest stock markets in the region that allows foreign investment.

Problem Statement

The stock return of firms diverges extensively with the changes in financial risk. It guides academics and investors to pay attention to look at exchange rate and inflation and interest rate exposure in Amman stock exchange market. Firms may have the same characteristics in a given month, be evidence for returns that are diverse from the other companies. The arbitrage pricing model provides investors a methodical way of relating how expected security returns must relate with the economy. All Exchange rate uncertainty and inflation and interest rate fluctuations effect multinationals and domestic firms.

Objective of the Study

The objective of the study is to examine impact of interest rate, exchange rate and inflation on stock returns of ASE.

Significance of the Study

Interest rate risk occurs due to alter in interest rate. The connection between interest rate and stock price return is contrariwise connected. While, exchange rate movements impact directly or indirectly many resolutions of the domestic in addition to international companies. Performance of the stock market is very vital to investors and they respond to macroeconomic variables which may change the performance of the stock market. Interest rate, exchange rate and inflation are the key macroeconomic variables which affect the market. This study will assist the investors by giving that experimental proof of interest rate, exchange rate and inflation therefore; it will help in their decision-making.

Hypotheses of the Study

1. Exchange rate has no significant impact on common stock returns.

2. Inflation rate has no significant impact on common stock returns.

3. Interest rate has no significant impact on common stock returns.

LITERATURE REVIEW

Output, the Stock Market, and Interest Rates (Blanchard, 1981)

Interest rate, exchange rate and inflation have some effect on the performance of stock market (Blanchard, 1981). He stated the interface between output and the stock market. He represented the connection of output, stock market and interest rates. Blanchard assured that higher stock money lowers interest rate. This means that lower cost of capital and in turn causes better stock market value. He reviewed that adjust in the rules for the reason that adjust in the stock market, because of real interest rate and anticipated profits. The publication of a rule shows the way to change in profits and discount rates. In turn it affects the performance of stock market.

Impact of interest rate, exchange rate and inflation on stock returns of KSE 100 index (Khan, *et al*. 2012): covers the impact of interest rate, exchange rate and inflation on stock returns of KSE 100 index. All the three macro variables are taken under consideration. They are considered very important for the economy of any country and any change among these variables affect the economy in various ways. In addition to that the regulatory authority takes steps in order to make changes in their policies which can affect the economy in a positive way. Ten years monthly data from 31st July, 2001 to Jun 30th 2010 is taken in consideration. Multiple regression models are applied on the data, the result shows that there is a weak relationship between the dependent variable and independent variables. The impact of interest rate and inflation is insignificant on stock returns of KSE 100 index while the exchange rate has significant impact on stock returns of KSE 100 index.

The Impact of Macroeconomic Factors on Amman Stock Market Returns(El-Nader & Alraimony2012): the principle idea of this study is to examine the impact of macroeconomic factors on ASE. Returns are provided by monthly data between (1991and 2010). This study employs six macroeconomic factors: just three related to our study, consumer price index (CPI), real exchange rate (E1), weighted average interest rates on loans and advances (WAIR). The normality test, unit root and OLS, ARCH /GARCH models tests are applied to the data. The OLS estimations are inefficient due the existence of serious autocorrelation and a sign of Multicollinearity, and are inconclusive. However, the results of the ARCH (1) estimation showed that CPI, E1, WAIR have a negative function on the ASE returns.

The Factors that affect shares' Return in Amman Stock Market (Qudah 2012): This paper tests the most important factors that affect the stock return and the excessive volatility. These variables are obtained from the period (2005-2010).the regression model was applied on 15 listed Industrial companies in Amman Stock Exchange (ASE). The results of this study show that the (interest rate and inflation rate) insignificant at 0.05 levels, which mean that each of them does not affect the stock return.

The Relationship between Amman Stock Exchange Index and the Exchange Rate Using Granger Causality Test (Dayyat 2012): This study investigates the relationship between the Exchange Rate and Amman Stock Exchange Index between (1989-2004).Granger Causality Test has been applied using data gathered from monthly and annual analytical reports from the Central Bank of Jordan and Amman Stock Exchange reports. A lot of previous studies have found that Exchange Rates and Stock Prices have predictive ability for each other. The results of this study show that there is no relationship between the Exchange Rate and Amman Stock Exchange Index.

Impact of Economic Factors on the Stock Prices at Amman Stock Market (1992-2010) (Momani and alsharari 2012): This paper investigates the effect of macroeconomic factors (interest rate, national product, money supply and industrial product index) on stock prices at Amman Stock Exchange, and to measure the impact of these factors on the general index of prices and the index for each sector (bank, industrial, insurance and services), for the time period from 1992 to 2010.The results of this study show that all factors of study have a significant statistical impact on share prices, in other side there are difference when we test each factor with the index (general, bank, industrial, insurance and services) the result show the interest rate has a statistically significant impact on the prices of the shares in Amman stocks exchange, negative effect on behalf of the index and the sectors index. The rest variable, which had a significant impact, was the production index where its impact was negative for general and sectors index except the insurance sector, which had a positive impact.

The relation between stock returns and short-term interest rates (Choi and Jen 1991): This study report that the expected returns on common stocks are systematically related to the market risk and the interest-rate risk. The findings of the study indicate that the interest-rate risk for small firms is a significant source of investors' portfolio risk and the interest-rate risk for large firms is "negative". The study also shows that the interest-rate risk premium explains a significant portion of the difference in expected returns between the top quintile and the bottom quintile of the NYSE and the MEX firms. Humpe and Macmillan (2007) also indicate both US and Japan stock prices are negatively correlated to a long term interest rate.

The Impact of Macroeconomic Variables on the Returns of Listed Stocks at Palestine Exchange: Economic Sectors Model (Abusharbeh & Abdel Karim 2016): this paper investigates the impact of economic factors on returns of Palestine Stock Exchange(PEX) and to test the validity of Arbitrage Pricing Theory (APT) in the context of Palestine. all listed firms at Palestine Exchange used as a sample. This paper test the main macroeconomic variables, such as interest rate, exchange rate, inflation, unemployment rate, and GDP per capita. The result show difference between firms. the interest and consumer price index have positively significant effect on the returns of banking and investment firms. But GDP per capita has a positive effect on the returns of insurance companies. While the exchange rate and unemployment rate have no significantly impact on stock returns in case of PEX.

Does inflation has an impact on Stock Returns and Volatility? Evidence from Nigeria and Ghana (Rano 2011): This study seek to test the effect of inflation on stock market return and volatility in Nigeria and Ghana. It was found from the model's returns that the volatility for Nigeria's market were significant but insignificant for the market Ghana. Market volatility was affected by inflation in both of the countries. An decrease in inflation caused an increase in market volatility but it was insignificant for the market of Ghana.

Furthermore, a lot studies carried out about this topic as Tabak (2006) indicates that there is no long-run relationship, but there is linear Granger causality from stock prices to exchange rates, in line with the portfolio approach Brazilian stock prices to exchange rates with a negative correlation. add to that the study shows evidence of nonlinear Granger causality from exchange rates to stock prices. The study of Horobet and Ilie (2007) offer contradictory results for Romania. While the application of the Engle-Granger methodology indicates no cointegration between the exchange rates and the stock prices, the use of the Johansen-Juselius procedure suggests the presence of cointegration between the two stock market indices and the exchange rates, either nominal bilateral, nominal effective or real effective rates. The study of Rasheed (2002) applied for south Asian countries i.e. Pakistan, India, Bangladesh and Sri Lanka, to test the impact of exchange rates on the stock returns in long and short run fluctuations in exchange rates. The study found no relation for both long and short run between stock returns and exchange rates for all countries.

In these two studies where applied in turkey ,Muradoglu and Metin (1996) indicate that the negative relation between stock prices and inflation persists when other monetary variables are included in the model. Ozturk (2008) shows that there is no causal relationship between inflation and stock returns

METHODOLOGY

The population of this research is all companies listed on the Amman Stock Exchange of Jordan. The data used in the empirical analysis is mainly secondary data collected from Central bank of Jordan and ASE published report for the period 2005 to 2015. Data on Treasury bill rates and exchange rates is collected from mixture of statistical bulletin issued by Central Bank of Jordan. Stock prices data is taken from Amman Stock Exchange (ASE).

In this study we are examining the impact of interest rate, exchange rate and inflation on stock returns of ASE free float index. For this reason monthly data of six month Treasury bill rate, exchange rate and inflation from, 2005 to 2015 is selected. Stock returns will be considered by computing change of ASE free float index points. So, multiple regressions are used to experiment the hypothesis. Whereas interest rate, exchange rate and inflation are independent variable and stock returns are dependent variable. Interest rate is 9th month Treasury bill rate and for exchange rate JD to $ rate is selected.

To examine the macroeconomic risk factors that influence the stock returns in this study; we employs multivariate regression analysis to explore the dependence of returns of firm on interest rate, foreign exchange rate, and inflation. Thus, the regularly approximate disclosure model looks like:

$$R_i = \beta_{0i} + \beta_1 ER + \beta_2 IR + \beta_3 INF + \mu_{i,t} \quad (1)$$

Where, R_i is the stock return, $\beta_1 \, to \, \beta_3$ are the coefficients of concerned variables, and

$\mu_{i,t}$ is the error term of firm i at time t. While ER is the exchange rate (US Dollar Vs JD), IR is the interest rate (6 months treasury bills), and INF is the inflation (CPI is used).

The control variables being used are measured by stock return (free float index) natural log. Stock returns of firm can be calculated by using following equation:

$$\text{Real stock returns} = \ln(P_t / P_{t-1}) \quad (2)$$

Where, P_t the ending return and P_{t-1} is the beginning return.

The change in the foreign exchange rate is calculated by employing the End of Period JD / $US exchange rate (Hassan and Javed, 2009) and the change in value is worked out through log differencing, i.e.

$$\text{Change in Foreign Exchange Rate} = \ln\left(FER_t \big/ FER_{t-1} \right) \quad (3)$$

ANALYSIS

This section presents an empirical analysis of the effect of macroeconomic factors on common stock returns.

Table 1: Brief summary of descriptive statistics

	N	Minimum	Maximum	Mean	Std. deviation
Returns	132	-.250182396	.1498308106	-.002285316	.0493312366
ER	132	.0	.0	.000	.0000
INF	130	-.035163912	.0586126836	.0033355809	.0091207406
IR	132	-.014000330	.0131273779	-.000257614	.0024078570
Valid N (listwise)	130				

Table (1) shows a brief summary of descriptive statistics. The average return of free float index in percentage terms are -2.2% with a standard deviation of 0.04%. The maximum returned of ASE listed firm is 0.14 whereas maximum loss is 0.25. The average change in T-bill rate in Jordan appears to be 0.0022 with a standard deviation of 4%. The average change in value of Jordan currency is 0% with a standard deviation of 0%.

Table 2: Correlation Matrix

	Returns	Exchange rate	Inflation	Interest Rate
Returns	1			
Δ ER	0	1		
Δ INF	0.18650504	0	1	
Δ IR	-0.19843419	0	-0.13104362	1

Table (2) presents results of correlation matrix to ensure that there is no existence of multicollinearity. According to results returns of the firms are negatively related to interest rate and, whereas positively related to inflation, and zero relationship with exchange rate. The highest positive correlation is 0.18 between return of the firm and inflation whereas highest negative correlation is -0.198 which shows that multicollinearity is not present among the selected variables.

Table 3: Regression Statistics

Multiple R	0.2560995231699763
R Square	0.06558696576788922
Adjusted R Square	0.04334800399684875
Standard Error	0.04805429819298206
Observations	132

Summery output of the regression model shows that the R square is 6.5 % which means that regression model approximated 6.5 % variation in dependent variable with standard error of 4.8 %. R square shows a weak relationship between independent and dependent variables.

Table 4: ANOVA Analysis

	Df	SS	MS	F	Significance F
Regression	3	0.02090898	0.00696966	4.5272905	0.00473
Residual	129	0.297888809	0.00230922		
Total	132	0.318797789			

ANOVA shows that the overall model is significant with F value of 0.004 (F= 0.004 < 0.05). The result of ANOVA table confirmed that the predicted model is significant at 5% significance level.

Table 5: Coefficient Analysis

	Coefficients	Standard Error	t Stat	P-value
Intercept	-0.006197406	0.004468094	-1.3870356	0.1678228
Δ ER	0	0	65535	0
Δ INF	0.889609908	0.467663803	1.90224239	0.0593688
Δ IR	-3.627003679	1.758843644	-2.0621524	0.0412006

Hypotheses Testing

 1. *Exchange rate has no significant impact on common stock returns.*

The results in Table 5 were used in testing this hypothesis. This hypothesis was tested using the reject/accept decision criterion. Table (5) shows the intercept and the coefficients of the regression model. Result of the regression model shows that exchange rate has zero impact on stock returns and significant at 5% significant level (P = 0 < 0.05). It indicated that there is no

relationship between the Exchange Rate and common stock returns.This hypothesis could be acceptedbecause the Jordanian Dinar is pegged to the US dollar might be. Foreign investors convert their returns on stocks into their home currency. Zero exchange rate results in lower returns when converted in to other currency which disappoint the foreign investors. In a related study, Dayyat (2008) by using Granger Causality Test find out no relationship between exchange rate and common stock returns. But that contrast with El-Nader & Alraimony (2012) study where they found negative relationship

2. Inflation rate has no significant impact on common stock returns.

According to Table5 .The coefficient of inflation is 0.88 which shows inflation has an impact on stock returns but this result is significant because (P = 0.05 = 0.05) that is indicate to significant and positive relationship between inflation and common stock returns. This hypothesis could be rejected. Our result similar to (Rano & Bayero, 2010) which show the effect of inflation on stock market return and volatility in Nigeria and Ghana. They found Market volatility was affected by inflation in both of the countries

In a related study, Khan, *et al.*, (2012) covers the impact of interest rate, exchange rate and inflation on stock returns of KSE 100 index. They find out inflation is insignificant on stock returns of KSE 100 index, that consist with AL – Qudah (2012) study.

3. Interest rate has no significant impact on common stock returns.

The above stated hypothesis was tested using the regression results in Table 5. Interest rate is negatively related (-0.036) to stock returns but significant as P = 0.04 < 0.05.then we reject this hypotheses.In a related study, El-Nader & Alraimony (2012) show an inverse relationship between interest rates & stock market returns. And Momani & Alsharari (2012) found that the interest rate has a statistically significant impact on the prices of the shares in Amman Financial Market, and the effect was negative on behalf of the index and the sectors index. Khan, *et al.*, (2012) find out a weak relationship between the interest rate and common stock return. The impact of interest rate is insignificant on stock returns of KSE 100 index.

The figure (1) below, it shows the relationship between returns and the other independent variables.

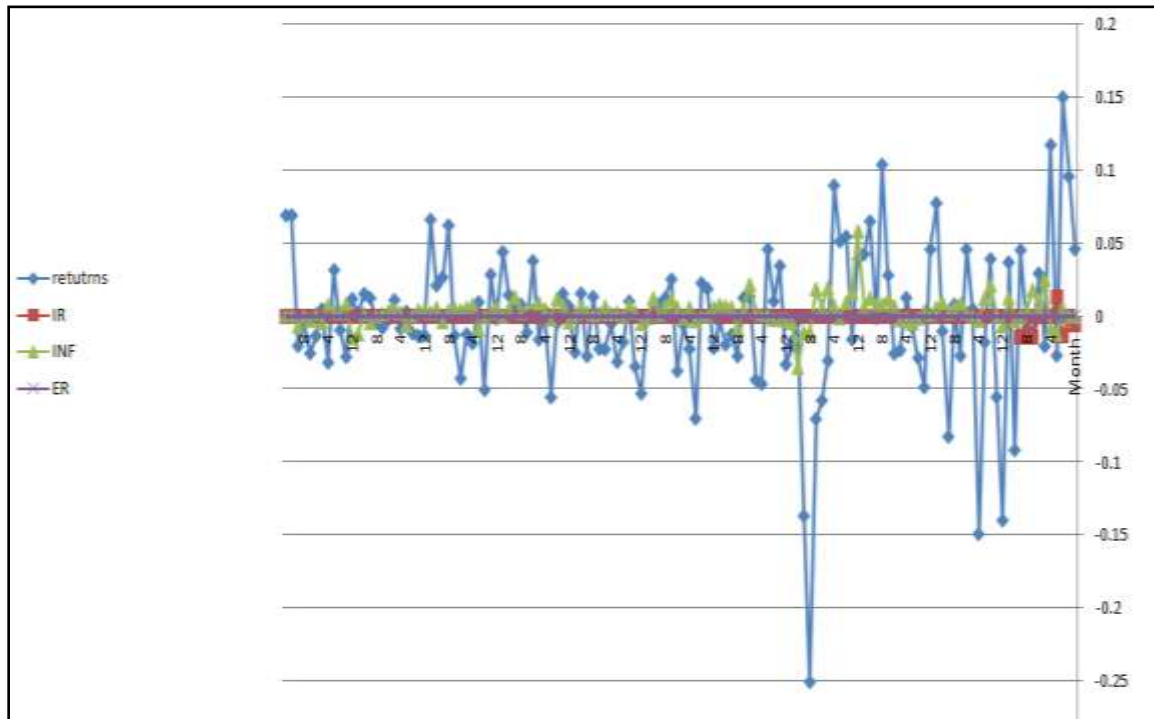Figure 1. Relationship between returns and the other independent variables
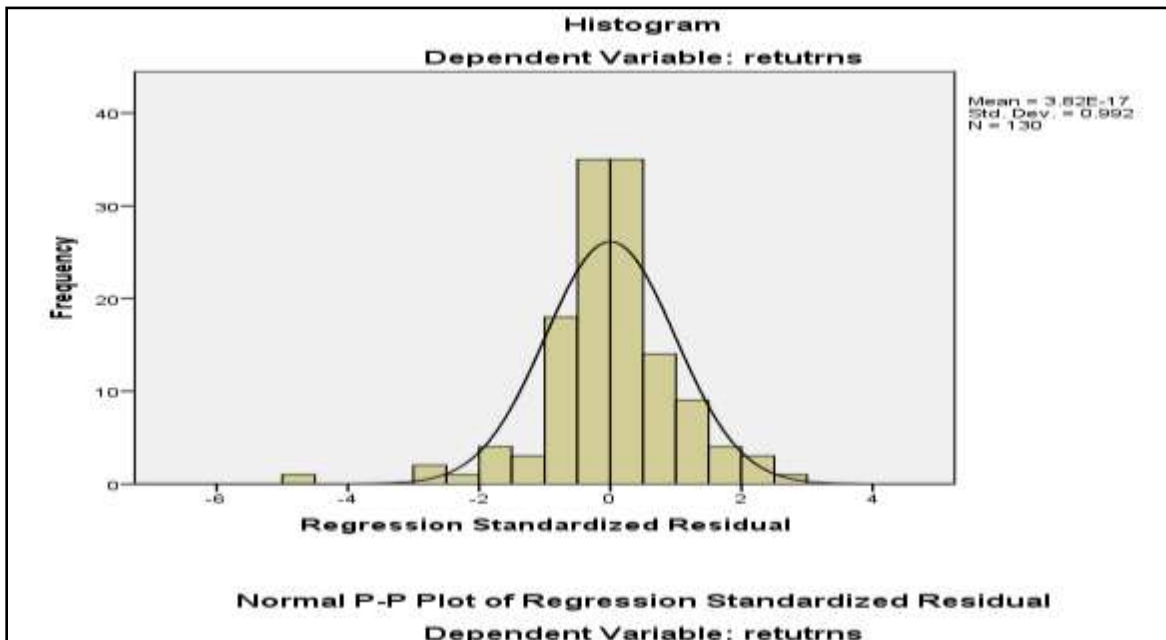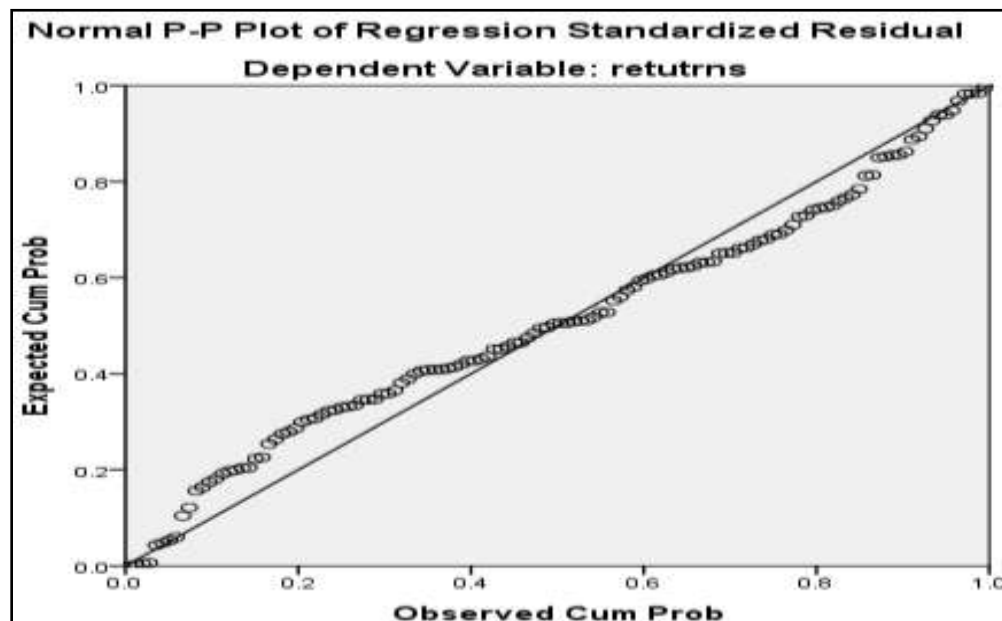

Figure 2. Histogram

Figure 3. P-P Plot

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: retutrns

CONCLUSIONS

This study examined the influence of interest rate, inflation and exchange rate on the stock returns of ASE. Results of the multiple regressions pointed out a weak variation in the dependent variable due to independent variables. Interest rate and inflation have significant influence on stock returns of ASE. Exchange rate is zero related to stock returns of ASE free float index. Moreover the result show positive relationship between inflation and stocks return but negative relationship between interest rate and stocks return.therefore, the investors should take into consideration the macroeconomic changes in determine of the prices of common stocks.And the decision maker in Jordan represented by central bank of Jordan try to keep moderate level of these factors (interest rate and inflation rate).

For the future research, it is recommended that more variables shall be taken as (GDP, real money supply, balance of payments) in other studies in order to realize the influence of other variables on stock returns.

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