

## IMPACT OF INTEREST RATE, EXCHANGE RATE AND INFLATION ON STOCK RETURNS OF KSE 100 INDEX

**Zohaib Khan MBA Institute of Management Sciences Hayatabad, Peshawar**

**E-mail: [zohaib.ims@gmail.com](mailto:zohaib.ims@gmail.com)**

**Sangeen Khan MBA Institute of Management Sciences Hayatabad, Peshawar**

**E-mail: [Sangeenkhan09@gmail.Com](mailto:Sangeenkhan09@gmail.Com)**

**Lala Rukh Lecturer Deptt Management Sciences University of Swat**

**E-mail: [lalarukhuos@gmail.com](mailto:lalarukhuos@gmail.com)**

**Imdadullah MBA Institute of Management Sciences Hayatabad, Peshawar**

**[Imdad87@gmail.com](mailto:Imdad87@gmail.com)**

**Wajeeh ur Rehman MBA Institute of Management Sciences Hayatabad, Peshawar**

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### ABSTRACT

This research covers the impact of interest rate, exchange rate and inflation on stock returns of KSE 100 index. All the three macro variables which is taken under consideration are considered very important for the economy of any country and any change among these variables effect the economy in various ways and the regulatory authority take steps in order to make changes in their policies which can affect the economy in a positive way. Ten years monthly data from 31<sup>st</sup> July, 2001 to Jun 30<sup>th</sup> 2010 is taken in consideration. Multiple regression model is applied on the data and 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.

**Key Words:** Interest rate, Exchange rate, Inflation, KSE100 index, Stock returns

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## 1. BACKGROUND OF THE STUDY

Macroeconomic variables affect the performance of the stock market. Investors consider macroeconomic variables when they value stocks. Interest rate, exchange rate and inflation are very important among these macroeconomic variables which affect the performance of the stock market. Interest rate is inversely related to stock prices as well as exchange rate. Interest rate is the cost of borrowing and also used as a discount rate to discount future cash flows of the financial assets. Increase in interest rate causes decrease in stock prices because required rate of return on stocks rises which causes decrease in stock prices. Actions of monetary authorities have a significant impact on stock prices and fluctuation of interest rates signals good or bad information to investors ( Lobo, 2000).

Exchange rate and stock market also has a relationship. Foreign investors convert their returns on stocks in to their own currency. Foreign investors get affected when local currency gets stronger and converted into weaker currency. Exchange rate has negative

relationship with stock prices. Stock prices decreases when exchange rate increases and decrease in exchange rate has positive impact on stock market.

A rapid increase in inflation also affects negatively the performance of the stock market. Growing inflation considered as a bad news by the investors because it depicts bad economic conditions in the country and investors feel insecure about their investment in the stock market. They expect tight monetary policy in future by the Fed to control inflation which in turn control money supply and firms suffer to get finance from banks due to higher cost of borrowing with tight credit terms. In case of decreasing inflation rate, it depicts good economic conditions and attracts investors to invest in the stock market.

In line of the above discussion interest rate and exchange rate and inflation has relationship with stock prices. This study will be conducted to test this relationship empirically. For this purpose a case of Karachi stock exchange will be selected because Karachi stock exchange is the biggest stock exchange market in Pakistan.

## 1.2 Objective of the Study

The objective of the study is to investigate impact of interest rate, exchange rate and inflation on stock returns of KSE 100.

## 1.3 Hypothesis

A) Interest rate is negatively related to stock returns.

B) Inflation is negatively related to stock returns.

C) Exchange rate is negatively related to stock returns.

## 1.4 Methodology

In this study we are investigating the impact of interest rate, exchange rate and inflation on stock returns of KSE 100 index and in this study multiple regressions is used to test the hypothesis. Interest rate, exchange rate and inflation are independent variable and stock returns are dependent variable. Interest rate is 6<sup>th</sup> month Treasury bill rate and for exchange rate PKR to \$ rate is selected. For inflation CPI is used. The monthly data from 2001 to 2010 is selected for the analysis.

## 1.5 Significance, Scope and Limitations of the Study

Performance of the stock market is very important to investors and they react to macroeconomic variables which may affect the performance of the stock market. Interest rate, exchange rate and inflation are the key macroeconomic variables which affect the market. This study will help the investors by providing empirical evidence of interest rate, exchange rate and inflation effect on stock market which will help in their decision-making. For this purpose monthly data of six month Treasury bill rate, exchange rate and inflation from 31<sup>st</sup> July, 2001 to Jun 30<sup>th</sup> 2010 is selected. Stock returns will be calculated by calculating change of KSE 100 index points.

As all the data taken for this research is secondary and the previous year's data was not available this is the main limitation of this research.

The time which given for the reporting writing was not enough for writing a comprehensive research.

## 2. LITERATURE REVIEW

Interest rate, exchange rate and inflation have some influence on the performance of stock market. (Blanchard, 1981) described the relationship of output, stock market and interest rates. He stated that higher stock money lowers interest rate which means lower cost of capital and in turn causes better stock market value. He summarized that change in the policy causes change in the stock market because of real interest rate and anticipated profits. The announcement of a policy leads to change in profits and discount rates which in turn affect the performance of stock market. He concluded that the flexible policies affects the nominal money which leads to change in the stock market.

(Kaul, 1987) stated that there is a inverse relationship among stock returns and expected inflation and positive relationship among stock returns and real activity. He test the hypothesis of that negative relationship by selecting data from 1926 through 1940. He summarized that this inverse relationship can be explained by understanding the equilibrium process in

monetary sector depending on money demand and supply influence.

empirically tested the sensitivity of bank stock returns to market, interest rates and exchange rate risks. They covered stocks of 48 US banks for the period of 1975 through 1987 and they found that exchange rate significantly negatively related to US banks stock returns.

(Lobo, 2000) studied the effect of interest rate changes on stock prices. He examined the behaviour of stock prices after Federal fund rate announcements and he found that before announcements of increase in Federal fund rate the asymmetry in price adjustments gets narrow. He also found that stock market response quicker to the news of overpricing than news of underpricing. He finally concluded that target rate announcement has significant impact on stock prices and convey new information to stock market.

(Devereux, Lane, & Xu, 2006) analysed alternative monetary policies. Financial crisis played an important role to improve monetary policy of emerging markets and they investigated exchange rate flexibility for its implementation. The model of study included nominal

regidities, lending constraints on investment and fluctuation of exchange rate for imported goods. They assumed that there may a deley occure in exchnage rate fluctuation while pricing importing goods. A littlr bit fluctuation of exchnagerate reduces nominal interest rate from the from the higher borrowing affect. They found that the stable properties of inflation trigering can be determined by the pass through of imported goods prices. In their study (Khrawish, Siam, & Jaradat, 2010) examined market capitalaizatation rate and interest rate for the market of Jardan named Amman Stock Exchange. Both variable are important to affect country's economy. Toexamine the realtionship sample from 1990 to 2008 was selected and OLS regression method was applied to test the hypothesis. The results of the study demonstrated a significant positive relationship and the first hypothesis (A) of nagative relationship among interest rate and market capitalization rate was rejected. They also found that there was a positive relationship among market development rate and market capitalization rate, so the B was rejected. The finally concluded that the

government play an important role to intervene in the finacial market of the Jarden.

(Rano & Bayero, 2010) studied volatility of stock returns and the impact of inflation. The applied Generaized Heteroskedasticity Model to investigate the relationship for the market of Nigeria and Ghana. Test of the normality of data descriptive statistics indicatoed average stock returns were positive but more volatile for the markets of Nigeria and Ghana. It was found from the model's returns that the volatility for Nageria'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.

(Mundell, 1963) investigated inflation and interest rate mechanism. He stated that the anticipated inflation cause a rise in the money rate of interest. Interest rate slightly fluctuates because of unstable cost of living. That is because interest rates rises when prices starts to increase but never that much high as it should be. It was assumed in the studay

that the real profits can be capitalized at real interest rate. Inflation causes a difference between money interest rate and real interest rate and this difference causes a gap between nominal earnings and money earnings.

In their study (Aydemir & Demirhan, 2009) analyzed impact of macroeconomic variables on the stock market of Turkey. The data from the periods of 2001 to 2008 was selected to analyze. They described the traditional approach which based on the concept that the stock market leads exchange rate movements. The augmented dickey fuller test of their study indicated that the data was integrated order one and the causality test confirmed bidirectional causality between exchange rate and the stock prices of Turkey stock exchange. The results of the study indicated positive causality among exchange rate and technology indices.

(Rasheed, 2002) Conducted a study for south Asian countries i.e. Pakistan, India, Bangladesh and Sri Lanka, to find the impact of exchange rates on the stock returns. The study examines this relation for all the countries in long and short run fluctuations in exchange rates.

The study used a monthly data for six years. The study found no relation for both long and short run between stock returns and exchange rates for India and Pakistan, also the same results were found for Bangladesh and Sri Lanka. As there is lack of relation between returns and exchange rates there is no need of using information regarding taking advantage from stock return due to fluctuation in exchange rate from one market to predict behavior in the other market. The study made recommendations for further research in this particular area by using weekly or even daily information in order to find more concrete evidence about stock returns and fluctuations in exchange rates.

(Muhammad, 1997) Found a correlation among stock prices and other macroeconomic variables i.e. foreign exchange rate, foreign reserve, wholesale price index, industrial production index, broad money and gross fixed capital formation. Their findings revealed that foreign exchange rate and broad money has got a positive correlation with stock returns. Capital formation and increase in production are insignificantly correlated with stock

returns. So it is concluded that earning abnormal profits is not in the hands of investors that is it depends upon the fluctuations in the macroeconomic variables. So investors can not earn abnormal profits by getting the available information from the market.

(Chow, 1997) In their studies worked on bond return and change in exchange rate. They illustrated there lies a first and foremost correlation effect of interest rate and exchange rate on contact of bonds returns and exchange rate. They notify bond returns get started affecting when there is negative association between interest rates changes at home country and exchange rate. When real exchange rate changes unexpectedly in correlation to change in interest rate lead to become the first and foremost exposure of bond to exchange rate. As interest rate and prices of bonds are negatively related, the negative association between interest rates changes at home country and exchange rate leads to a positive effect of exchange rate and rate of interest experience. For stocks exchange rate coverage illustrates both effect of cash flow and interest rate.

(Kok, 2003) In their study work on economic volatility and instability of stocks returns. They measured economic volatility by ups and downs in inflation rate, growth in output and interest rate movement. They showed that movement in interest rate, inflation and deflation, and growth of output have little power of predictability to predict stock return or instability in stock returns. They illustrated that risk premium of market increases adversely when volatility of market is high. But at the end they demonstrated evidence of movement of inflation and output growth on volatility of stock return and notify that in Philippine returns of stocks are inclined by High inflation.

### **3. RESEARCH METHODOLOGY**

#### **3.1 Theoretical Framework**

Karachi stock exchange 100 index is the biggest exchange and work as a benchmark for investors for the comparison of share prices. There are 34 sectors listed at KSE 100. The share prices adjusted to 1000 points and these points are compared to base year points to compare the performance of the market. There are many macroeconomic variables affecting the

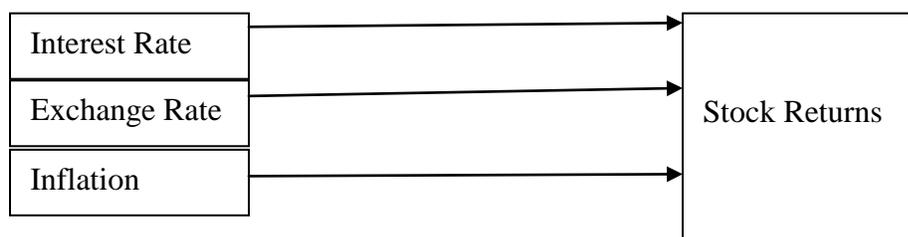
performance of the share market. Interest rate, exchange rate and inflation are very important among these variables. Investors do consider these variables while making decisions about their investments. Fluctuation of interest rate results in change of value of the investment. Fed increases target fund rate to control money supply (inflation) which affects businesses. Foreign investors convert their return on

investments in to their home currency and exchange rate has vital importance because of this. Higher exchange rate makes them not to invest and move on to some other secure sources to invest. To test the impact of these variables empirically, interest rate, exchange rate and inflation are selected as independent variables and stock market return is dependent variable.

**Figure: 1 Relationship between dependent and independent variables**

**Independent Variables**

**Dependent Variable**



### 3.2 Methodology

This chapter includes the research methodology of the study.

### 3.3 Multiple Regression Model

Study will employ multiple regression analysis to test the hypothesis. The multiple regression model is:

$$S = \alpha + \beta_1 IR + \beta_2 ER + \beta_3 INF + \epsilon_t$$

.....(4.1)

S = Stock Returns

IR = Interest rate (6 months treasury bills)

ER = Exchange Rate (US Dollar Vs PKR)

INF = Inflation (CPI is used)

$\epsilon_t$  = Error term

Stock return will be calculated as

$$S = \frac{P_1}{P_0} \dots \dots \dots (4.2)$$

Inflation can be measured by many indicators which are consumer price index, wholesale price index and the service price index. In Pakistan CPI, WPI and SPI is used to measure inflation rate in the country. Consumer price index compares the prices of basket of goods and services with the

base year prices. The prices are compared with the base which is 2000-01. The main indicator is CPI in Pakistan to measure inflation. It measures the aggregate price level in 35 major cities of Pakistan and it includes 374 items. SPI measures inflation on weekly basis and it covers 17 major cities. WPI measures the items which are consumed on primary and secondary level and the information of prices of items directly collected from wholesale market or firms. WPI covers five major groups which contain 425 items.

In this study PKR to Dollar exchange rate is selected to analyze the impact of exchange rate fluctuation on stock returns. The reason is that most of trades transactions across the country are denominated in dollars due to its stable value, and for Pakistan its exchange rate are high so if we make exports we will receive more PKR.

Interest rate is the cost of borrowing and it can be nominal interest rate, real interest rate or market interest rate. Nominal interest rate is a rate without adjusted for inflation while real interest

rate takes the affect of inflation into account. In this study 6 month Treasury bill rate is selected for analysis which is risk free rate.

### 3.4 Data Description

This study will be conducted to find out impact of interest rate, exchange rate and inflation on stock returns of KSE 100. Therefore secondary data of six month Treasury bill is collected from the web site of state bank of Pakistan and the data of exchange rate and inflation are collected from the website of

Federal Bureau of Statistics Pakistan. The data of stock prices will be collected from the web site of Karachi Stock Exchange 100 Index.

### 4. DATA ANALYSIS

This chapter of the study describes the data analysis and results of the study. The results of the multiple regression are describes in Table 4.1, Table 4.2, and Table 4.3.

Table 4.1 shows the summery output of the regression model.

Table 4.1: Summery Output

<i>Regression Statistics</i>	
Multiple R	0.307097
R Square	0.094309
Adjusted R Square	0.067929
Standard Error	0.088157
Observations	107

Summery output of the regression model shows that the R square is 9.4% which means that regression model approximated 9.4% variation in dependent variable with standard error of 8.8%. R square shows a weak relationship between independent and dependent variables.

Table 4.2:  
ANOVA

	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	3	0.083353	0.027784	3.57509	0.016543
Residual	103	0.800483	0.007772		
Total	106	0.883836			

ANOVA shows that the overall model is significant with F value of 0.01 ( $F = 0.01 < 0.05$ ). The result of ANOVA table confirmed that the predicted model is significant at 5% significance level. Table 4.3 shows the accuracy of coefficients.

Table 4.3: Estimates of model 4.1

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	1.02871	0.008753	117.5318	1.5E-111
$\Delta$ INF	0.001662	0.009811	0.169402	0.865813
$\Delta$ IR	-0.06278	1.739224	-0.03609	0.971277
$\Delta$ ER	-0.03037	0.01009	-3.00971	0.003288

Table 4.3 shows the intercept and the coefficients of the regression model. The coefficient of inflation is 0.001 which shows inflation has no impact on stock returns but this result is insignificant because  $P = 0.86 > 0.05$ . Interest rate is negatively related (-0.06) to stock returns but insignificant as  $P = 0.97 > 0.05$ . Result of the regression model shows that exchange rate has negative

impact on stock returns and significant at 5% significant level ( $P = 0.01 < 0.05$ ). Foreign investors convert their returns on stocks into their home currency. Higher exchange rate results in lower returns when converted in to other currency which disappoint the foreign investors.

## 5. CONCLUSIONS

This study investigated the impact of interest rate, inflation and exchange rate on the stock returns of KSE 100. Results of the multiple regressions indicated a weak variation in the dependent variable due to independent variables. Interest rate and inflation have insignificant impact on stock returns of KSE 100. Exchange rate is negatively related to stock returns of KSE 100 index. Increase in exchange rate causes decrease in stock returns of KSE 100. The decrease in the stocks return is because when the foreign investors invest their money in the stocks and by increase in the exchange rate causes decrease in their income because they will get less amount of money in their own currency because of increase in the exchange rates which is not a favorable for the foreign investors.

### 5.1 Recommendations/Suggestions.

Suggestion for the investors is that they must closely analyze the exchange rate patterns and forecast the future exchange rates before investing in KSE 100 and based on those forecasted exchange rates they can maximize their profits

The recommendations for the further research are that more variables can be taken in other researches in order to find out the impact of other variables on stock returns.

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