

Effects of macroeconomic determinants on KSE-100 index: An Empirical study in Pakistan

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ABSTRACT

This paper is to examine the relationship between the KSE100 index and some of economic variables namely interest rate, inflation rate, CPI and foreign exchange rate. For analysis purpose, secondary data were used for the period of 1991 to 2005. Multiple Regressions and Pearson's correlation model were applied to the data to find the relationship between KSE100 index and macroeconomic variables. Model was good fit and was strong relationship between dependent and independent variables. The tests show that there is 83% variation in the stock prices by variation in independent variables. The results also suggest that the impact of independent variables is positive on KSE-100 index except interest rate.

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1. Introduction

The Karachi Stock Exchange is the biggest stock market in Pakistan and oldest stock market in south Asia. The 654 firms were listed in this market with total market capitalization over U.S \$30 billion in national as well worldwide in 2009. Trading in KSE happening with 50 shares index, after it turned into KSE 100 indexed in 1991. KSE declared best performing stock market in 2002. As Stock Market assume a significant part in present day period in the lift up of the economy. Change in stock trade list causes unsettling influence in the macroeconomic elements (Adam et al.2008).

Longstanding Research considers looks at and offer confirmations about macroeconomics determinants influence stock trades costs. The developing linkage between macroeconomic factors and the development of stock costs for the created nations have well been reported in the writing in the course of the most recent quite a long while (Fama, 1981; Lee, 1992; Kaneko and Lee, 1995; Mukherjee and Naka, 1995; Booth and Booth, 1997; Mavrides, 2000; Maysami and Koh, 2000; Sadorsky, 2003; Chen, 2003).

Then relationship between macroeconomic variables and a developed stock market is well documented in literature. In this study, we are using four macroeconomic indicators and checking the impact of these four indicators on the KSE-100index. This review with regards to Pakistan to check the connection between macroeconomic determinants and KSE-100index. This review takes thought into four macroeconomic markers, like, inflation rate, interest rate, consumer price index (CPI) and Exchange rate to check the effect of these free factors on the depended variable KSE-100 list. Numerous scientists have connected many models in the captivation to decide the connection between macroeconomics markers and stock costs record.

The investigation of (Adam et al. 2008) reasoned that vacillations in macroeconomic factors, which prompts the

change the structure of stock trade record. The administration polices whether it is financial or monetary greater affect the monetary exercises and stock costs of a nation (Abdullah1997). Abdullah and Hayworth (1993) inspected that loan fee reacted adversely on stock returns while stock returns were emphatically connected with expansion rates and cash development.

Securities exchanges give speculation opportunity. Securities exchange of any nation quickens the monetary development. Good and bad times in stock costs are a reasonable dilemma of economies among the financial specialists, company, approach creators and scientist. Specialists are attempting to discover the components, which impact stock costs. The major macroeconomic factors are expansion, mechanical creation record, financing cost, total national output, trade, conversion scale, cash supply, remote trade stores and unemployment has causality with costs file of stock trade (Booth 1997 and Chan 2003).

Mohamed et al. (2007) analyzed the contact of macroeconomic figures on stock returns Malaysia which set up a significant relationship between stock expenses and development. Stock trade market is crucial performing artist of budgetary part and gives a stage to the clients and providers of the money related assets for venture reason in the supplies of organizations. Kyereboah-Coleman and Agyire-Tettey (2008) analyzed the impact of macroeconomic factors on Ghana Stock Exchange. They found those macroeconomic pointers for example, loaning rates and the expansion rate impact on securities exchange execution.

Financing cost and remote conversion scale dangers are two vital monetary components influencing the normal stocks (Hyde, 2007, Vazz et al., 2008). The stocks are delicate to financing costs, as the adjustments in loan fees are contrarily identified with stocks (Alam, Uddin, 2009). The closing stages of this paper are to research the impacts of macroeconomic indicators on the execution of the Karachi

stock exchange. Then rest of the paper is sorted out in the supplementary areas. Part 2 gives Review of literature. Segment 3 talks about Data and methodology. Empirical Analysis is displayed in sector 4. The conclusion of paper at section 5 and at the end of the paper limitation of the study and future implication's sections are 6 and 7.

2. Literature review:

Survey shows the connection between securities exchange list and macroeconomic factors, for example, Exchange rate, consumer price index, Interest and Inflation rate has been specified.

Devi and Chandramohan (2016) held the review and discover the connection between macroeconomic pointers and Nigeria securities exchange returns month to month information is utilized from January 2000 to walk 2013 and utilized expanded dickey fuller test, unit root test and investigates the connection that is altogether utilized macroeconomic factors are coordinated and have significant impact on Nigerian securities exchange returns.

Ilahi, Ali, and Jamil (2015) took that the effect of swelling rate, loan fee and conversion scale on the arrival of stock KSE100 file. They utilize the three autonomous and one is needy variable (stock returns). Utilize the information from January 2007 to December 2012 and utilizing a different direct relapse show for information examination. They presumed that these free factors have week effect on the stock return.

Nijam, Ismail, and Musthafa (2015) considered with regards to Sri Lanka inspected that there is a connection between Colombo stock trade and five macroeconomic factors (Exchange rate, Balance of installments, Inflation by entire deal value list, Interest rate, GDP). Information utilized from 1980 to 2012 utilizing the normal slightest square to gauges the parameters of the relapse demonstrate. Discoveries of this review there is a solid causality between macroeconomic elements and securities exchange execution in the Sri Lanka.

Kpanie, Vivian, and Sare (2014) took the review in the Ghana setting and inspected the dynamic association between macroeconomic factors like as Treasury bill (intermediary for loan cost), Inflation rate, exchange rate, Interest rate, Oil costs and cash supply these are the autonomous factors with ward variable Ghana securities exchange. At that point find that there is a long run connection between a portion of the macroeconomic factors and securities exchange. At that point utilized quarterly time arrangement auxiliary information from 1995 to 2011 utilizing the blunder adjustment models, Augmented Dickey more full, co-reconciliation examination.

Zaheer and Rashid (2014) inspected the review and check the effect of macroeconomic factors on the share trading system comes back with the utilized of five macroeconomic pointers like as modern creation, exchange rate, Money supply, finance cost and inflation and found that there is long haul relationship exist between macroeconomic factors and securities exchange and furthermore find that the mechanical preparations have direct association with securities exchange returns and expansion have negative connection with securities exchange returns and swapping scale additionally relate with securities exchange contrarily. These outcomes indicating exhort over the long haul the Pakistani securities exchange will be receptive to the macroeconomic factors.

Zafar (2013) considered and portrayed the outside direct speculation and esteem exchanged have constructive outcome

on the execution of the stock exchange and furthermore found that there is converse connection between interest rate and securities exchange rate and furthermore saving money segments have no critical effect on the stock exchange index.

Kuwornu (2012) held the review and discover that through the investigation with the utilization of month to month information from 1992 to 2008 and each of the four pointers are co-incorporating with stock return of Ghana and have long run harmony relationship. The Johanssen multivariate co-combination test is utilized for examination and found that inflation rate and treasury bills have incredible impact on the stock return in brief day and age.

Jasra, et al (2012) inferred that the association between ward variable (associations return) and free component (interest rate, exchange rate, purchaser esteem record) is unimportant yet these variable similarly have vast impact on the insurance business and using backslide show technique for data examination these data taken from four undertakings, for instance, oil, and gas substance, and assurance industry. Purchaser esteem list has immense effect on manufactured and solid industry. Oil and gas and insurance industry however change scale has shown that the enormous negative impact on four organizations moreover found that there is nice association between the macroeconomic figures and stock rundown Pakistan.

Asaolu and Ogunmuyiwa (2011) inspected the review and found the effect of macroeconomic pointers overall offer cost of Nigeria securities exchange after utilized the diverse test like as expanded ducky more full test, granger setback test, co coordination and blunder adjustment demonstrate on utilized time arrangement information and find that there is frail connection between macroeconomic factors and normal offer cost in Nigeria.

Rahman, Sidek, and Tafri (2009) inspected the review with regards to Malaysia and locate the financial police factors impact on the Malaysia stock trade and found that the local supply consider has critical connection with the stock trade advertise. All in all, four macroeconomic factors exchange rate, interest rate, cash supply and mechanical creation list have endless effect on securities exchange in both ways decidedly and adversely.

Hussainey and Khanh Ngoc (2009) Inspected the review and found the impact of macroeconomic pointers on Vietnam stock costs with the utilization of information from 2002 to 2008 and utilized test vector auto relapse display and furthermore utilized vector mistake remedy model and discover long haul connection between macroeconomic factors and Vietnam stock price.

Research Methodology:

Description of Variables:

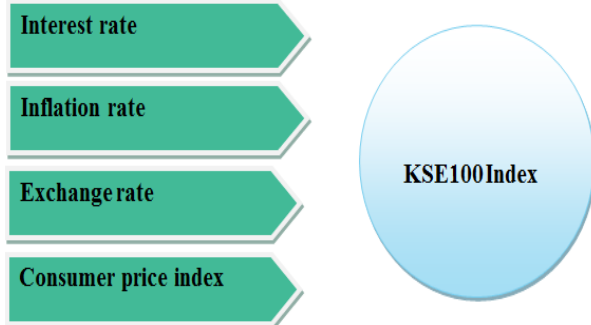
In this paper, there are Inflation rate, Interest rate, Exchange Rate, consumer price index are independent variables and KSE 100index is dependent variable. Here is the effect of independent variables on dependent variable. Inflation tells us the prices over different periods of times due to fall in the buying value of money. Interest rate is the annual cost which comes from using the borrowed amount on principle value. Exchange rate is the rate where two countries' currencies can be exchanged for another country currency. And the consumer price index measures different prices level at different times at market level of goods and services that a consumer purchased.

Data Collection:

The main objective of the paper is to examine the relationship between independent variables namely Inflation rate, Interest

rate, Exchange Rate, consumer price index with the dependent variable KSE 100 index. Yearly data from 1991 to 2005 have been used for these variables. In this paper the secondary data have been used for achieving objectives of the paper. The data for these variables have taken from different sources such as Trading economic website, SBP, KSE and Google etc. for determination of these variables on KSE 100 index.

Theoretical Framework:



KSE is the leading stock exchange of Pakistan and stock prices are used as a benchmark by the investors in this stock exchange. KSE have several sectors that are affected by variations in stocks prices. Macroeconomics indicators have affected stock prices such as inflation rate, exchange rate and interest rate. In this model the inflation rate, interest rate, exchange rate and CPI are macroeconomic indicators and have used as an independent variable and KSE 100 index is used as a dependent variable.

Research Model:

In this paper the multiple regression model was used for analysis purpose to find the relationship between dependent and independent variables. The dependent variable is KSE 100 index and independent variables are Exchange rate, inflation rate, interest rate and CPI.

The following is the model

$$Y = A + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + \dots$$

BNXN

Where

Y= KSE100 index

X1= Inflation (inf)

X2= Interest Rate (int)

X3=Exchange Rate (exch)

X4= Consumer Price Index (CPI)

$$\text{KSE-100 index} = \alpha + \beta_1(\text{inf}) + \beta_2(\text{int}) + \beta_3(\text{exch}) + \beta_4(\text{CPI})$$

Result and Findings:

Regression Analysis

Method:

We have found the relationship between dependent and independent variables from the data used in the analysis shown in the given table.

$$\text{KSE-100 index} = \alpha + \beta_1(\text{inf}) + \beta_2(\text{int}) + \beta_3(\text{exch}) + \beta_4(\text{CPI})$$

$$\text{KSE-100 index} = (-535.2527) + (436.5455) \text{INF}_1 + (436.5455) \text{INT}_2 + (52.04829) \text{EXCH}_3 + (.0394416) \text{CPI}_4$$

Using the mentioned data in the table we have got the result that when there is change comes in the independent variable so it will bring changes in the dependent variables. The independent variables are used in this paper are Exchange rate, inflation rate, interest rate and CPI which bring changes in the dependent variable KSE 100 index. From the given data in the table the results inflation rate, foreign exchange and CPI shows positive relationship with dependent variable KSE 100 index and interest rate shows negative relationship with dependent variable.

Table# 1. Descriptive statistics.

Variable	Observation	Mean	Std. Dev.	Min	Max
KSE	15	2335.961	1877.119	1147.943	7825.115
INT	15	4.935333	2.089726	.95	6.69
INF	15	8.133333	3.636652	3.1	13
FOREX	15	42.92377	14.26806	22.4228	61.4258
CPI	15	13467.73	11622.74	4003	30695

The result shows that there is negative relationship between interest rate and KSE100 index. When there is change occur in the interest rate so it brings -0.7759 percent negative changes in KSE 100 index stock prices. Also, the independent variable inflation has also negative relationship with KSE100 index, when there is 100% change occur in inflation so it brings -0.1554 percent changes in KSE100 index stock prices. There is positive relationship between foreign exchange rate and KSE100 index, if there is 100% change occur in foreign exchange rate so it will bring 0.5153% change in stock prices in KSE100 index. Also, the relationship between CPI and KSE100 index is positive and if change occurs in CPI so it will bring 0.6486% changes in stock prices (KSE100 index).

We have used the following data analysis to check the significance level of the model to know the significance and insignificance of the variables.

Table# 2. Correlation among variables.

	KSE	INT	INF	FOREX	CPI
KSE	1				
INT	-0.7759	1			
INF	-0.1554	0.6252	1		
FOREX	0.5153	-0.7871	-0.8387	1	
CPI	0.6486	-0.8855	-0.7518	0.8902	1

Table#3. Regression Model.

KSE	Coefficient	STD. ER.	t	P>t	95% Conf. Interval	
INT	-697.9578	252.3856	-2.77	0.020	-1260.308	-135.6076
INF	436.5455	123.77	3.53	0.005	160.7689	712.3222
FOREX	52.04829	45.24867	1.15	0.277	-48.77202	152.8686
CPI	.0394416	0.0611008	0.65	0.533	-.0966993	.1755826
Const	-535.2527	3180.086	-0.17	0.870	-7620.925	6550.42

$$F = 12.54, \text{Prob} > F = 0.0007, R\text{-squared} = 0.8337$$

T-Ratio

Through T-ratio individual significance of the regression coefficients are checked. so, first we will find the degree of freedom for this test. To find the degree of freedom, the total number of variables will be deducted from total number of observations that are;

In this study the number of observation is 15 and 4 variables are used namely

$$\text{Degree of freedom} = 15 - 5 = 10$$

Find the confident level which is $\alpha = 0.05$

Value of the t-tabulated is (1.753) and in our table the t-calculated value for each independent variable is given. From the table, the t-calculated value will compare with t-tabulated value which shows the variable is significant or insignificant. T-calculated value for exchange rate from table 2 is (1.15), interest rate is (-2.77), inflation is (3.53) and CPI is (0.65). we conclude from the data that, inflation rate value is greater than then t-calculated value so its mean this variable is statistically significant, while exchange rate, interest rate and CPI are statistically insignificant because their values are less than the t-tabulated value.

F-Ratio

To check that the overall model is significant or not, we used f-test for this purpose. So, first we find the degree of freedom confidence interval of f-tabulated from the f-distribution table. We will compare the f-tabulated and f-calculated value if the f-calculated value is greater than the f-tabulated value so its mean the overall model is significant and if the f-calculated value is less than the f-tabulated value then overall model is insignificant. So here f-calculated value is (12.54) and the f-tabulated value is (3.06) that is greater than f-tabulated value which shows the overall model is significant.

Coefficient of Determination (R^2)

From the R^2 it can be finding that the model is fit or not the coefficient is determined ranged from 0 to 1. When the value is near to 1 so then the model is good fit. Here in the table the R^2 is value is (0.8337), which is near to (1) which shows that there is (83%) variation in the dependent variable that has explained by the independent variable. Result tells us the model is good fit and there is strong relationship between dependent and independent variables. The variation in stocks prices explained up to eighty three percent by the variation in independent variables.

Conclusion:

Macroeconomic indicators in the economy that affect the stock prices of stock exchange in a country. The KSE is the biggest stock market in Pakistan which capture up to seventy four percent of capital market of Pakistan. Stock exchange plays a vital role in a country economic development. We have used four macroeconomic variables for finding the impact of these variables on KSE stock prices. Data were used for the period of 1991 to 2005. Multiple Regressions and Pearson's correlation model were applied to the data to find the relationship between KSE100 index and macroeconomic variables.

Model was good fit and was strong relationship between dependent and independent variables. The tests show that there is 83% variation in the stock prices by variation in independent variables. Moderate positive correlation between inflation and stock prices and it is also statistically significant, that confirmed the result of the (Asperm 1989) research study. From the relationship, it was Concluded that independent variables show positive and negative or direct and indirect relationship but not strong enough to consider important.

The finding from the test shows (83%) variations in the dependent variable were explained by the independent variables namely exchange rate, interest rate, inflation rate and CPI. Therefore, the model was good fit and the relationship between dependent and independent variable is strong and variation in stocks is explained by independent variables. The results also suggest that the impact of independent variables is positive on KSE100 index except interest rate.

The relationship between interest rate and stocks prices is negative which means that when rate of interest increase, the stock prices of stock exchange decrease. This confirmed the previous research studies, which were conducted by different researchers. (Nishat and Shaheen 2007), (Asperm 1989) shows negative correlation between interest rate and stock prices. Analysis among the independent variables suggests no such strong correlation amongst the independent variables which are for Further Research.

Limitations of the Study:

The analysis is based on the data gathered for the year 1991 to 2005. Data size is small but due to the lack of time and data availability, we were restricted. Our result is reliable under these limitations. For better and comprehensive results on KSE- 100 index, we need large sample size. A cross country study of developing countries with rich data is recommended to further investigate the determinants of Macroeconomic.

Future implications:

This study is mainly emphasis on specifically macroeconomic determinants on KSE- 100index in Pakistan. A cross country study of developing countries with rich data is recommended to further investigate the impact of macroeconomic determinants like gold rate, Industrial Production (IP), Human capital (Labor force), infrastructure, domestic investment, wholesale price index (WPI), Balance of payment and economics growth on Karachi stock Exchange 100 indexes in Pakistan. Data can also be taken for larger sample sizes to increases the generalizability of the findings.

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