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MACRO-ECONOMIC ANALYSIS ON KSE-100 INDEX WITH SCNERIO OF PSX: A LITRATURE REVIEW OF THE LAST DECADE

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ABSTRACT

This exploratory research conducts a macroeconomic analysis on Karachi Stock Exchange, KSE-100 index, using the data of the last decade, covering time period from January 2005 to December 2016. As part of our literature review, we could only find such studies on past data, hence, the research gap in the study, i.e. to conduct a macroeconomic analysis on KSE-100 index in a refined manner using the recent data of the last decade. In the field of Equity Analysis, two types of analysis are often used, i.e. Fundamental & Technical Analysis. The latter uses the past trends of the stock prices to extrapolate the future movements while applying different tools and techniques. Fundamental analysis, on the other hand, relies on the fundamental factors affecting the performance of the stocks. Fundamental factors, in turn, can be taken from three domains, which are company factors, industry factors, & macroeconomic factors. This research attempts to analyze macroeconomic factors to determine their impact on stock performance, using KSE-100 index as the barometer. The research performs multiple regression using KSE-100 as the dependent variable and five macroeconomic indicators as independent variables (predictors), i.e., interest rate, exchange rate, inflation rate, foreign direct investment (FDI) and government expenditures. The five predictors were chosen because of their significant (direct/indirect) impact on the performance of companies and their stocks which is also evident from the literature review. The source of secondary data for this research were mainly two websites, i.e. Pakistan Stock Exchange website and State Bank of Pakistan website. After checking for the validity of all the assumptions of multiple regression analysis, the regression results showed that FDI and interest rates have negative and significant relationship with KSE-100; Inflation, on the other hand, has insignificant impact on KSE-100 INDEX. Apart from this, exchange rate and government expenditures have strong positive and significant relationship with KSE-100 INDEX. The results also showed that interest rates and exchange rates have major contribution in the variation of KSE-100 index. The results of the data can be of immense use in future for investment analysts and academicians alike in analyzing stock performance in Pakistan.

Introduction

Economic growth and prosperity rely extensively on the efficiency of the capital markets. Efficient capital markets ensure optimal capital mobilization in an economy. After globalization, international markets are progressing more quickly. Economy is positively affected by the markets of international capital; it protects the economy from financial crisis and reduces the overall systematic risk. The investors who are looking for profit maximization should have complete information related to the efficient markets, but there are chances of reduction in unusual profits due to the macro economic factors. Investment analysts and the portfolio managers cannot help investors to increase unusual profits continuously because there is positive as well as negative impact of macroeconomic factors.

Economic development of stock market can be advanced by mitigating the risk. And by adding financial assets liquidity and to go for intelligent investments, but there are few factors which makes it difficult to go for wiser investments and such factors are macro-economic factors. If these macro-economic factors affect positively then investors can earn more profit but if these factors affect negatively then the investors will be in loss. The returns of stock market are disturbed by these macro-economic variables. The most dynamic investor is that who invests with the expectations that stock price will increase in future. And from other side bearish investor is that who believes that market conditions are not contributive according to profits and they make investments accordingly.

Different macroeconomic variables are used by various researcher to examine the most influential factor on stock price. Kotha & sahu (2016) used exchange rate, whole sale price index, T-bills and M3. To discover the long run relationship between these factors and Indian stock market i.e. BSE and the results shown the existence of long run relationship between BSE and selected variables. Whereas, darrat (1990) used money supply and fiscal policy (budget deficit) to explore the relation between macro factors with capital market in Canada i.e. Toronto stock exchange 300 index. The outcomes of the study shown that Canadian stock market has significant influence of budget deficit while with money supply the insignificant relationship was found.

There exist a huge literature volume on how stock price affected by economic indicators and much of the investigation is based on the presumption that these forces have some influence on stock prices.

In various finance text books the most widely held models to control the stock returns are Arbitrage Pricing Theory (APT) and capital asset pricing theory (CAPM). According to APT (Ross, 1976; Roll and Rose, 1980) shocks and surprises of multi factor can be used to explain the return on stock. The relationship between the asset and many common risk factors can be used in predicting the asset returns. APT use a linear combination of many independent macroeconomic variables in forecasting the relationship between the return of a collection of securities and single asset. Since APT is a multifactor model it can also be thought of as the one in which macroeconomic variables are used to explain stock returns. A single model factor CAPM is derived from Markowitz's idea of divergence and it was further advanced by Sharpe (1964), Lintner (1965), Mossin (1966). It states that investors should only consider market factor in the calculation of return on stock. Shareholders need to be compensated in two ways, Time value of money and Risk. A risk is considered only a systematic risk (uncontrollable) or market risk Beta (β). Which includes macroeconomic forces i.e. inflation, interest rate changes, money supply or even recession as they shake the whole country.

Brief History of Pakistan Stock Exchange

Pakistan stock exchange was established on 18th September 1947. It was incorporated on 10th march 1949. Initially there were only five companies which were listed on stock market with the investment of 3 million. In KSE the first index was introduced and that involved 50 companies and that is known as KSE 50 index. Trading was used to be taken in an open outcry

system. The system of computerized trading was established in 2002 and that involves daily trading of 1 million transactions and the capability to supply connectivity to the large number of users.

In 1970 in the month of October in Lahore the second stock exchange market was established under the securities and exchange ordinance in order to fulfill the needs of major cities in Punjab. When it started it had 83 members and it was located in a house of rented building in crowded bank square area of Lahore.

One more stock market was introduced in Punjab known as Islamabad stock exchange market, on October 25, 1989 in the capital city of Pakistan and the goal was to make it the best stock exchange market by providing to the needs of those areas which are less developed in northern side of Pakistan. This stock exchange market was licensed on 7th January 1992.

The management of these three stock markets was separated as well as the indexes, listing benchmark etc. that is why they had no any mutual connection with each other. These three type of markets were acting like as nonprofit markets with the shared structure. And that structure created conflicts in terms of interests and to perceive threaten interest of investors. So under the act of 2012 known as Demutualization Act that was established by the government. In which they merged all the three stock exchange markets to introduce a new combined stock exchange market known as Pakistan Stock Exchange market on 11th January 2016. The basic underlying reason of merging the three stock exchanges was to disintegrate membership rights and trading rights, in order to make the functioning of stock exchange in Pakistan more efficient and in line with the international standards.

Listing of PSX

On December 19th, 2017 the number of companies which were listed in stock exchange market are 581 with the total market capitalization of Rs: 8191.719 billion. The listing is made on the structure basis and rules and duties which are made by the securities and exchange commission of Pakistan and PSX management limited. All companies which are listed are classified into major business sectors. On December 19th 2017 the number of sectors which are listed on PSX is 35.

Source: (www.ksestocks.com)

KSE-100 Index

KSE-100 INDEX was introduced in November 1991 with the 1000 points of base value. The index consists of 100 companies that are based on sector image and high free-float market capitalization which catches over 80% of the overall free-float market capitalization that are listed on stock exchange. The number of sectors that are selected is 35. i.e. from each region one company is selected which is based on biggest free-float market capitalization and other remaining 65 listed companies are selected on the bases of biggest free-float market capitalization in declining order.

Macroeconomic Analysis

The purpose of this research is to identify the impact of macro-economic factors on performance of the stock market. Most of the researchers have examined that macro-economic factors have significant impact on the stock market. Based on the literature review and the knowledge gained through textbooks on Macroeconomic Analysis, various macroeconomic factors have been assessed to determine their impact on stock market performance as explained in the following sections:

Macroeconomic Economic Factors Used in the Research:

Inflation rate

Inflation rate is defined as the rate at which price of goods and services are increasing at general level and therefore the currency's purchasing power will decline. Central banks try to put limits on inflation rate so that economy can run more smoothly.

The general perception is that Inflation has a negative impact on the stock market. The increase in inflation results in low earnings. And

if earnings will be low then savings will be low which will ultimately decreased the investment in the stocks.

Exchange rate

An exchange rate is a rate in which we check out the worth of one currency in terms of another foreign currency. For instance, the exchange rate of dollar shows how much dollar value in other country.

Exchange rate has positive impact on the stock market. If exchange rate is higher in home country than host country, then investors invest in their home country and if exchange rate is lower in home country than they look for an investment opportunity in the host country.

Interest rate

Interest rate is the cost of borrowing money which is charged by the person who is giving the loan to the person who is taking the loan. They are mostly recorded on annual basis and that is called Annual Percentage Rate (APR).

Interest rate is one of the factor which has negative impact on the stock market. If banks provide high interest rate as compared to the investment in any other business then every investor will deposit his money into banks because investors' goal is to maximize the profit so they invest in fixed income securities which result in the decline of stock market.

Foreign Direct Investment

FDI is the investment in made by the investor or any company from one country to another country. And control of the company is in the hands of the foreign investor who has purchased it.

In development of stock market FDI's role is considered as very strong. It is noticed that FDI activate economic growth which ultimately develop the stock market. There are two types of FDI. Inward means investment of other country in your country and outward means investment of your country into other country. If other countries invest in your country that will give positive impact on stock market.

Government Expenditures

Government expenditure means buying goods and services to give future benefits to general public. Includes infrastructure investments and transfer of payments that rely on income and capital transfers.

Government expenditure has significant impact on stock market development. If government increase their spending they inject the money and employment opportunities in the economy which ultimately increase the purchasing power. On the other hand, the support from government at high level may increase profit which is distributed as dividend to its shareholders. High profitability, high dividend and high purchasing power can build the attractiveness of the companies which are listed on the stock market. And will definitely enhance the performance of stock market.

Literature Review:

Since literature review supports the findings and analysis of the study, it has been considered the most important part of any research. It provides a deep understanding about the research study. By reviewing the previous investigation the researcher identifies the potential weakness or research gap and then attempts to fill that gap. Thus, reviewing the literature is now considered mandatory before conducting the study.

(Barakat, Elgazzar, & Hanafy, 2015) explored the relationship among macroeconomic forces and stock market in two emerging economies, i.e. Egypt and Tunisia by considering the variables CPI, money supply, and exchange rate. The data was examined from January 1998 to January 2014. The outcomes shows there is a causal relationship between Egypt stock market and these predictors. And in Tunisia stock market only CPI has no causal relationship with stock exchange. The co-integration of all four variables was also revealed from the analysis.

(AA Alrub, T Tursoy, 2016)critically emphasized the Long-run and Short-run Relationship between Macroeconomic indicators and Stock Prices in Turkish market. They examined the effect of changes in monetary policy and used other dummy variables to overcome inflation rate and exchange rate in turkey market. They use the

technique of VAR model. The findings of this research paper shows that the empirical evidence and long term relationship between macroeconomics factors (money supply, exchange rate and index of industrial production) and Turkish stock market is properly maintained and they overcome the world crises and monetary policy by adding the dummy variables in the model.

(Ali, 2011)investigated the long run equilibrium, short run dynamics and causal relationship between Dhaka stock exchange and macroeconomic factors. Monthly data of following variables (CPI, GDP, foreign remittance and import payment) from period 1987 to 2010 were used in this study, which was analyzed with the help of co integration test, vector error correction model (VECM) and granger causality test. The output of co integration test and VECM indicated that variables are co-integrated and the system corrects its previous period's level of disequilibrium by 5.98 % per month whereas, the causality test depicts the stock price has unidirectional causality with CPI and foreign remittance and bidirectional causality with import payment while there's no causal relationship between GDP and stock prices.

(Aurangzeb, 2012) critically emphasized the factors influencing the performance of stock market: Evidence from south Asian countries i.e. Pakistan, India and Sri Lanka by taking in the account FDI, inflation, Exchange rate, and Interest rate as independent variables. The data from the time period 1997 to 2010 were used and analyzed with help of multiple regression. The findings of the study indicates stock markets in south Asian countries have positive and significant relationship with Foreign Direct investment and exchange rate while negative and significant relationship with interest rate. Whereas with inflation, it has negative and insignificant relationship.

(Bilson, Brailsford, & Hooper, 2001)critically emphasized on the macro level variables influencing emerging stock markets returns. The study was based on 20 emerging stock markets includes six Latin American countries (Argentina, brazil, Chile, Colombia, Mexico, Venezuela) six from Asian counties (India, Malaysia, Philippines, Taiwan and Thailand) two from African counties (Nigeria and Zimbabwe) and one from European county (Greece) and one from middle east county (Jordan). The data was collected from international finance corporation (IFC) from time period January 1985 to December 1997. Independent variables of this study were money supply, exchange rate, inflation and industrial production. The finding suggested that exchange rate has most significant influence on twelve emerging stock market return with negative sign. While money supply is positively influential in four markets and industrial production in two markets and CPI in one market. In conclusion, these variables have significant impact on emerging stock markets.

(Atiq, Rafiq, & Roohullah, 2010) critically emphasized on the internal as well as external factors affecting stock prices: A case Study of Karachi stock Exchange by analyzing the data from 2001 to 2008 of Independent variables i.e. Earnings per share, GDP, interest rate, CPI and money supply. And the impact was seen on 15 companies of financial sector listed in Karachi stock exchange. Two analysis tools were used in this study, i.e. panel data regression (random effect and fixed effect) and weighted least square to remove the problem of autocorrelation. According to the findings of this paper, money supply, EPS and GDP have significant positive impact on stock prices, while interest rate has negative and insignificant relationship with stock price.

(Talla, 2013) critically emphasized on the Macro level factors influencing the stock prices of the Stockholm Stock Exchange (OMXS30) by analyzing the impact of certain macroeconomics variable on the stock prices of Stockholm stock exchange. The sample was monthly data from 1993-2012. Data was tested on regression ordinary linear square and Granger causality respectively. According to the findings, currency and inflation rate have significantly, negative impact on stock price. While in Granger causality inflation rate has unidirectional relation with stock price. On the other side remaining factors

of macroeconomics has no unidirectional relation with stock price. Interest rate and money supply have insignificant impact on the model. Whereas, interest rate has negative and money supply has positive impact on stock prices.

(Arabi, 2016) critically emphasized on the Factors influencing average Stock Prices: "Empirical Evidence from Khartoum Stock Market", by analyzing the data of the variables (Real GDP, money supply, inflation and real interest rate) from 1995 to 2014. Data was analyzed on SPSS (EGARCH model) and EVIEWS respectively. According to the findings, the average stock price of KSE has positive relationship with real GDP and money supply whereas, it has negative relationship with real exchange rate and inflation.

(Chittedi, 2015) critically emphasized on the macro economic variables impact on stock prices in a BRIC stock markets by analyzing the long run and short run relationship between macroeconomic variables and BRIC Stock market by testing the data on autoregressive distributed lag and Granger causality respectively. According to the findings, BRIC stock market are not change of several macroeconomics factor because of sizable proportion of stock market capitalization as share of country GDP.

(Cooper, Lee, Howe, & Hamzah, 2004) critically emphasized on the Relation of stock market indices with Macro factors. With the analysis of Singapore stock market index. As well as with several Singapore exchange indices i.e. hotel index, property index and finance index. By investigating the long run equilibrium between the several macroeconomics forces and stock market of (STI). The sample was monthly data from Jan 1985 to Dec 2001. Of the variables (Interest, inflation, exchange rate, industrial production and money supply) which was tested with the help of VECM model. According to the findings, STI and SEC All-S Equities property index make substantial association with all macroeconomic factors While SEC All-S Equities hotel index only money supply and interest rate were found insignificant on the other hand, SEC ALL-S Equity Finance index economy activity and money supply were not significant.

(Hsain & Mahmood, 2016)critically emphasized on the stock market and the macroeconomic factors in Pakistan. The sample was annual data from 1959-60 to 1998-99 of the variables, consumption expenditure, investment spending and GDP. The analysis tools of this study were correlation, co integration and error correction. They found there was a low correlation between stock price and macro factors. Moreover, the long run relationship with stock price and macro factors was found by co integrations and a unidirectional causality between stock price and macro factors was depicted from error correction test. The cause behind their findings was under development of Pakistan stock market.

(Elly & Oriwo, 2012) they explored the macroeconomic variables influencing on Nairobi securities exchange all share index (NASI). By taking into the account key factors i.e. inflation, lending interest rate and 91 day T bills. From the era March 2008 to March 2012. But later lending rate was dropped out due to multicollinearity with 91 day T bills. The rest of the data was analysed through regression. According to the findings, 91 days T bills is negatively correlated with (NASI). Whereas, on the other hand inflation is weak but positively correlated.

(Osamwonyi & Evbayiro-osagie, 2002) critically emphasized whether stock market in Nigeria has an impact of macroeconomic factors. The annual data from 1975-2005 of the variables (interest, inflation, exchange, GDP, Fiscal and money supply were used to conduct the analysis. And these analysis was done with Vector Error Correction Model (VECM) in order to identify short run dynamics and long run relationship between independent and dependent variable. The findings depicts interest rate has negative and insignificant influence on SMI in both ways long and short, CPI has positive impact on SMI both ways but only significant in one case i.e. long run, GDP has positive and significant relationship with SMI in only long run, there's a positive but insignificant relationship between Fiscal and SMI in short run. SMI has positively correlated exchange rates in short run and negatively in long run. And money supply M2

has negative relationship with SMI in both ways i.e. short and long.

(Gunasekarage, Pisedtasalasai, & Power, 2004) critically emphasized on the macroeconomic influence on stock prices of south Asian market. By analyzing long run and short run connection between the macro economic variables with Colombo Stock Index. They used 17 years data from 1985-2001 of the variables (money supply, CPI, T bill inflation rate and exchange rate). And these analysis was done with VECM model IRF and VDC. According to the findings, money supply T bill and CPI has significant impact but T bill has greater effect on price changes whereas, share prices has no impact on macroeconomic factors on the other hand VDC and IRF analysis that macroeconomic factors are observer to predict variance error of the market index.

(Vejzagic & Zarafat, 2013) critically emphasized on influence of Macro-economic factors on the capital market of Malaysia i.e. HIJRAH SHARIAH INDEX. By investigating the Relation between macro level factors with Bursa Malaysia Hijrah Shariah Index. The sample was monthly data from 2006 to 2012 of the variables (CPI interest rate money supply and exchange rate). By tested data from VECM VDC IRF. According to the findings, money supply exchange rate and interest have significant and positive influence. While the interest rate and exchange Rate has negative impact on the other hand CPI has insignificant impact on stock market of Malaysia.

Statement of the Problem:

Since stock market plays a vital role in the economy of the country, many individuals, firms, entrepreneurs and government invest large amount in stock market. But we also know that these stock markets are highly volatile, every minor changes in economy affects them whether positively or negatively. In order to forecast every change, investors must have an idea about which external factors have strong influence on stock market. In Pakistan, only few studies have been conducted to identify macro factors affecting KSE-100 Index. And most of them were based on late 90's or early 2000's data; thus, further investigation was required. This research, therefore, attempts to carry out fundamental analysis of macroeconomic factors to determine their impact on the performance of the stocks measured through KSE-100 index.

Research Design:

Research design is basically a framework or plan for a study which is used as guide in gathering and analyzing the data (Churchill, 1996). It is basically a blue print or outline of the research. This research project is based on exploratory research. In which it will explore macroeconomic factors affecting KSE-100 Index. To explore the factors, monthly data from past twelve years is going to be used in this study. The data will be tested and analyzed on SPSS through multiple regression, correlation and the relevant graphs. The output of this study will be completely based on findings.

Research Questions:

To determine the relationship between various macroeconomic factors and the KSE-100 index.

To determine how significantly each macroeconomic variable impacts the performance of stocks measured through KSE-100 INDEX.

Research Hypothesis

Based on the research questions, the study is going to test the following hypothesis:

H_1: There is a significant relationship between Interest Rates and KSE-100 INDEX

H_2: There is a significant relationship between Government Expenditures and KSE-100 INDEX

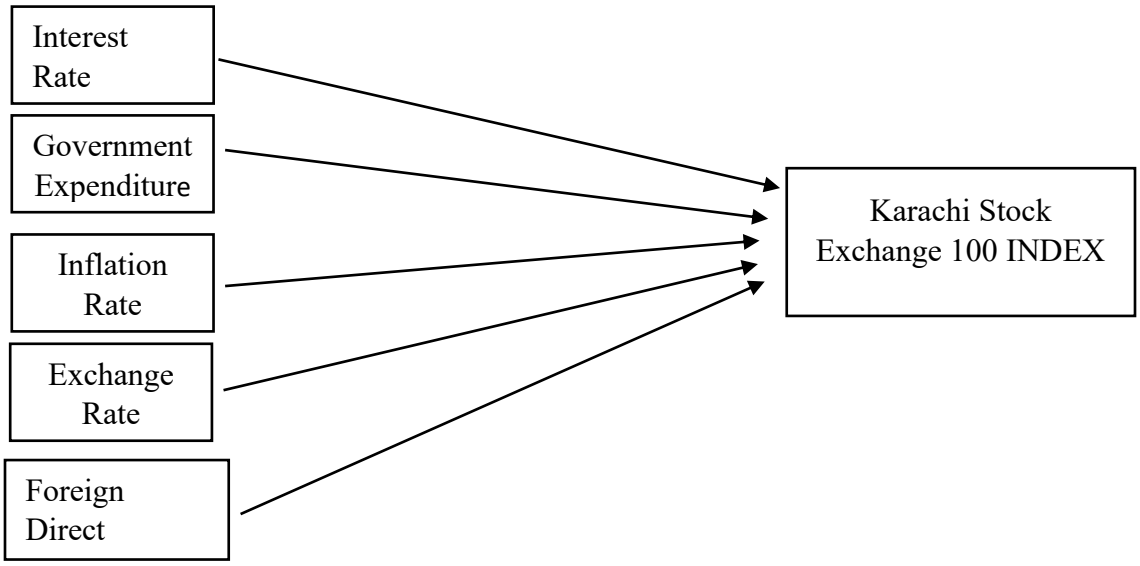
H_3: There is a significant relationship between Inflation and KSE-100 INDEX

H_4: There is a significant relationship between Exchange Rates and KSE-100 INDEX

H_5: There is a significant relationship between Foreign Direct Investment and KSE-100 INDEX

Conceptual Framework

The conceptual framework of this study is designed below:



Research Methodology

Collection of data

The study is completely based on secondary data of past twelve years. The monthly data from the time period 2005 to 2016 of variables (interest rate, exchange rate, inflation rate, government expenditure and foreign direct investment) were used in this study. The data of KSE-100 index was collected from official website of Pakistan stock exchange and Most of the data of economic indicators were collected from the website of State Bank of Pakistan and some of them from gdpinflation.com and ieconomics.com.

Population and sample size

Population of this study include all the companies listed in Pakistan stock exchange i.e. 581. But this research paper is going to conduct the fundamental analysis on those 100 companies having highest market capitalization, (KSE-100 INDEX). Moreover it's been 25 years since KSE was found i.e. 1991. But as it was mentioned earlier that late 90s and early 2000s data were used many times for analysis and now no longer relevant. So sample size of this study is KSE-100 index monthly closing values of the last twelve years. The monthly data of 2005 - 2016 were used in this study for the purpose of answering the research questions and testing the hypotheses. The sampling method, therefore, used is non-random sampling

Research Approach

There are two types of research approaches, deductive and inductive. This study does not attempt to devise new theories out of newly formed hypothesis but attempts to validate the already established relationships through other various researches, based on the recent data. Several other theories are already formed regarding macro level factors influencing stock exchanges. This research is going to test those theories by taking the most popular macroeconomics factors as independent variables and dependent variable as KSE-100 index with different sample. So the approach of this research is purely deductive

Data Analysis and Testing

Data must be cleaned, coded and properly analyzed. The tool used in this study was SPSS (statistical package for social sciences) in which multiple regression and correlation between variables were performed to analyze the data, describe the relationship among variables and reach the conclusion. Based on the selected variables, the multiple regression equation of the study would be:

KSE-100 = α + β1 (interest rate) + β2 (government expenditure) + β3 (inflation) + β4 (Exchange rate) + β5 (FDI).

Descriptive Statistics

The following table delineates the descriptive statistics. It indicates the minimum, maximum and standard deviation of the variables.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Interest rate	144	5.75	14.50	9.7986	2.36844
Govt_exp	144	83,417	326,758,333	138,334,683.52	142,834,353.702
Inflation Rate	144	1.32	25.33	9.6183	5.11527
Exchange Rate	144	59.3219	108.3849	84.090492	17.0107491
Foreign_Direct_Investment	144	-53,900,000	1,262,900,000	216,986,805.56	199,451,605.588
KSE_100	144	5,377.42	47,806.97	17,403.7406	10,252.08760
Valid N (listwise)	144				

The mean represents average value and the standard deviation shows the deviation of values around the mean. Whereas the N in the table shows total number of sample i.e. 144.

Interest rate has 5.75 minimum with 14.50 maximum value with mean 9.78 and standard deviation 2.368. Government expenditure has minimum value 83413 maximum 326.7 M the mean of government expenditure is 138.3 M and standard deviation 142.8M. Inflation rate has 1.32 and 25.33 minimum and maximum values. With mean of 9.618 and standard deviation 5.115. Exchange rate has 59.3 and 108.3 minimum and maximum values with mean of 84.0 and standard deviation 17.0. FDI has negative value as minimum i.e. -53.9 M and 1262.9 B. has mean value of 216.6 M and 199.4 M of standard deviation. The minimum and maximum value of dependent variable of this study i.e. KSE100 is 5377 and 47806. With mean and standard deviation of 17403 and 10252.

Multiple Regression

The extension of linear regression is known as multiple regression. It is used when we have two or more independent variables. With the help of it we can estimate the value of dependent variable based on the value of other variables. The main advantage of using multiple regression is that the overall fit of the model and contribution of each variable to the total variance is only explained by it. The acceptance or rejection of the hypothesis is based on the results of multiple regression. Before running the analysis in multiple regression there are some assumptions which need to be tested. Step 1 includes testing of assumptions .Step 2 includes output analysis and testing the hypothesis.

Correlations

		KSE_100	Interest_rate	Govt_exp	Inflation_Rate	Exchange_Rate	Foreign_Direct_Investment
Pearson Correlation	KSE_100	1.000	-.682	.842	-.656	.739	-.152
	Interest_rate	-.682	1.000	-.439	.805	-.178	-.008
	Govt_exp	.842	-.439	1.000	-.565	.881	-.388
	Inflation_Rate	-.656	.805	-.565	1.000	-.328	.186
	Exchange_Rate	.739	-.178	.881	-.328	1.000	-.438

	Foreign_Direct_Investment	-.152	-.008	-.388	.186	-.438	1.000
	KSE_100	.	.000	.000	.000	.000	.034
	Interest_rate	.000	.	.000	.000	.016	.461
	Govt_exp	.000	.000	.	.000	.000	.000
Sig. (1-tailed)	Inflation_Rate	.000	.000	.000	.	.000	.013
	Exchange_Rate	.000	.016	.000	.000	.	.000
	Foreign_Direct_Investment	.034	.461	.000	.013	.000	.
	KSE_100	144	144	144	144	144	144
	Interest_rate	144	144	144	144	144	144
	Govt_exp	144	144	144	144	144	144
N	Inflation_Rate	144	144	144	144	144	144
	Exchange_Rate	144	144	144	144	144	144
	Foreign_Direct_Investment	144	144	144	144	144	144

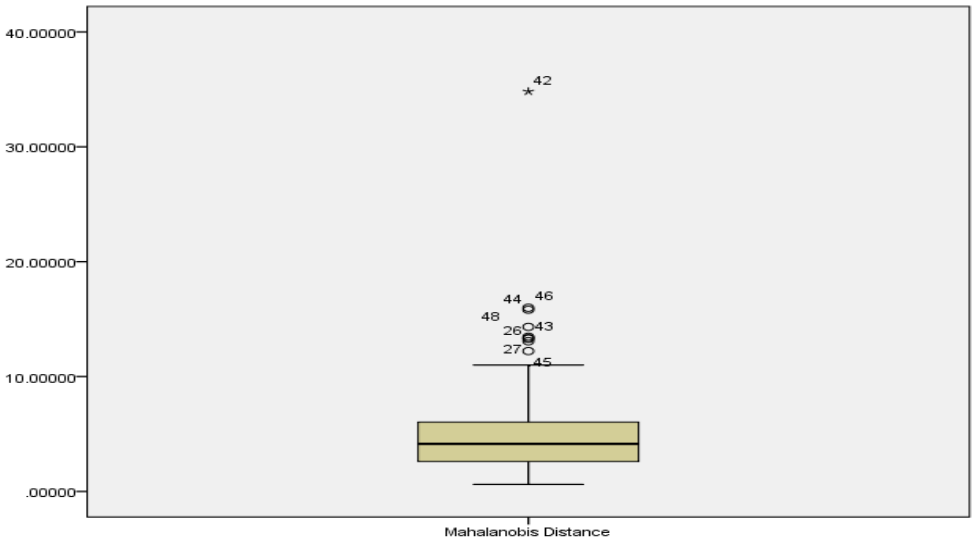
Coefficients[a]

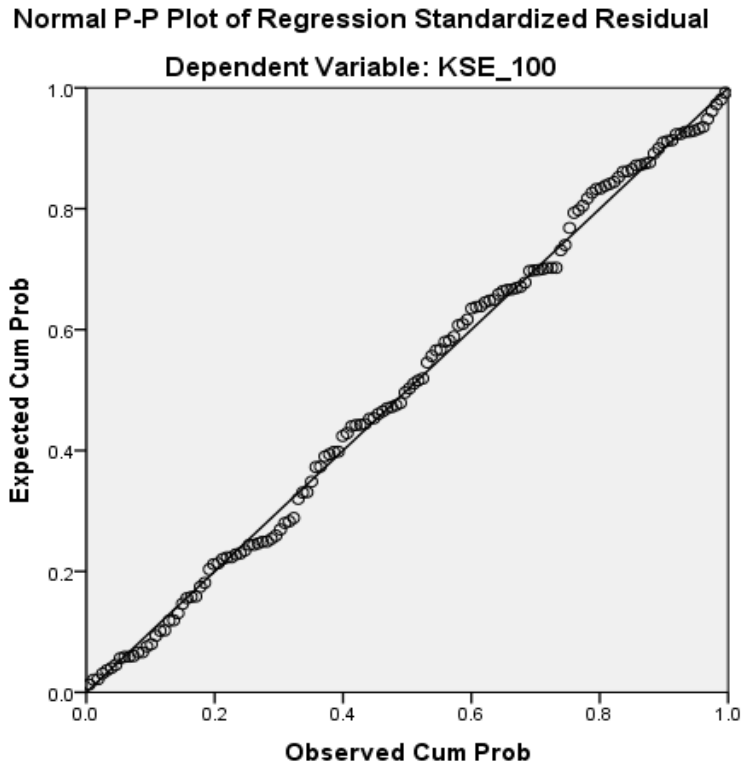
Model		Collinearity Statistics	
		Tolerance	VIF
1	Inflation_Rate	.281	3.561
	Exchange_Rate	.164	6.113
	Foreign_Direct_Investment	.763	1.310
	Interest_rate	.308	3.250
	Govt_exp	.131	7.641

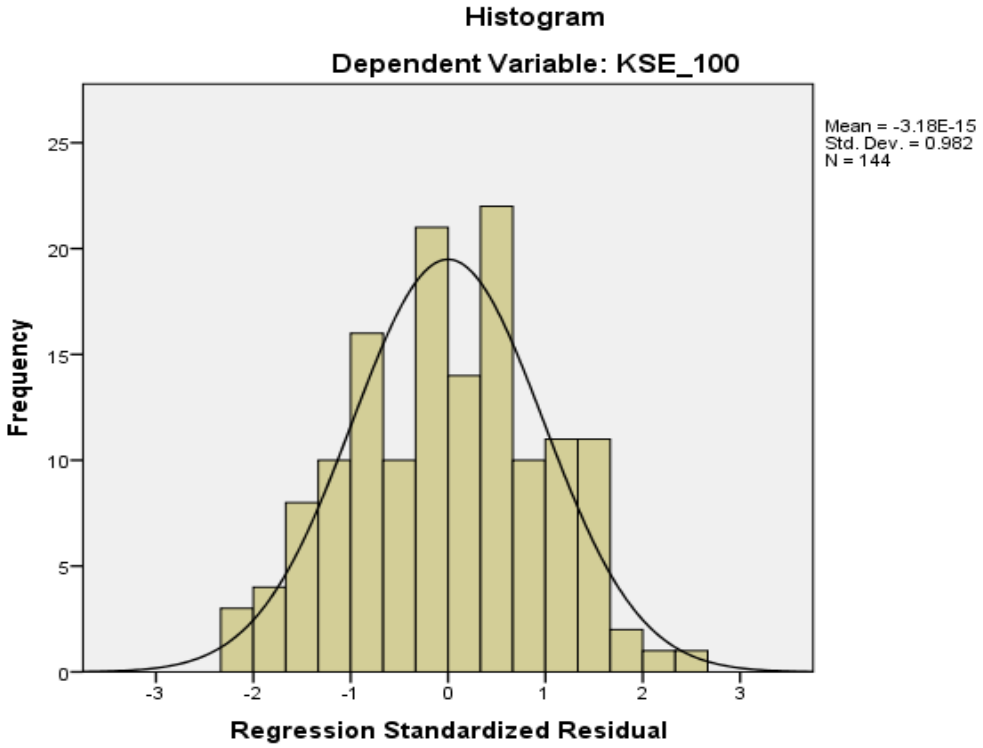
Dependent Variable: KSE_100

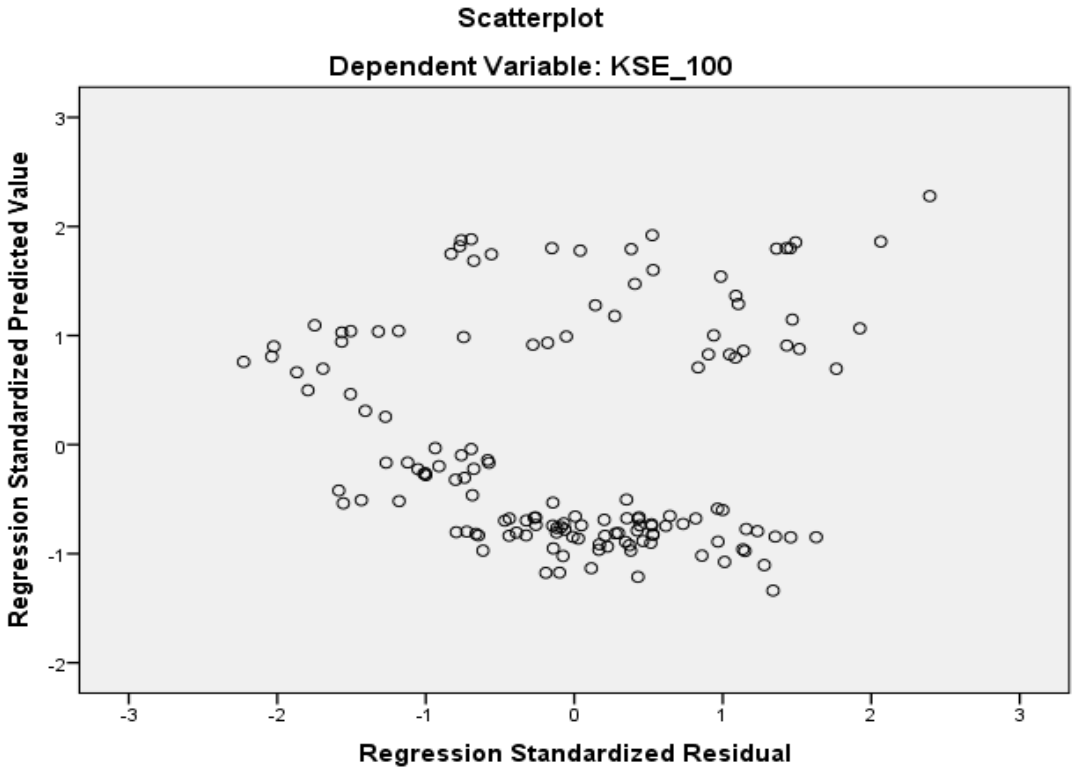
Extreme Values

		Case Number	Value
Mahalanobis Distance	Highest 1	42	34.81891
	2	46	15.98783
	3	44	15.81525
	4	48	14.32462
	5	144	13.47233
	Lowest 1	94	.61057
	2	93	.72574
	3	95	1.11292
	4	102	1.11824
	5	96	1.13000


40.00000
30.00000
20.00000
10.00000
.00000
42
44
46
48
26
43
27
45
Mahalanobis Distance


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: KSE_100
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Histogram
Dependent Variable: KSE_100
Mean = -3.18E-15
Std. Dev. = 0.982
N = 144
Frequency
Regression Standardized Residual


Scatterplot
Dependent Variable: KSE_100
Regression Standardized Predicted Value
Regression Standardized Residual

Multiple regression has six basic assumptions, it is necessary to make sure that all the assumptions are met and there's no violation in your data before stepping into the analysis.

Sample Size: The sample size should not be too large or too small. Different authors have given different suggestions regarding the sample size. According to Tabachnick and Fidell (2001) if you have five independent variables you must have at least 90 cases to run the analysis. In our study we have 144 cases with five independent variables, indicating the first assumption is met.

Multicollinearity: The relationship among independent variables is known as multicollinearity. If the predictors are highly correlated i.e. (r =.9) indicates the independent variables have strong relationship among each other. But the most accurate method to check multicollinearity is tolerance (must not less than .1) and VIF (must not above 10) value under the coefficient table. In our data interest and exchange rate highly correlated with inflation and government expenditure i.e. .80 and .88 but still not more than .90 furthermore, in the coefficient table we can see that lowest tolerance value is .131 and highest VIF value is 7.641, these values are within their range. Hence, it is proved there's no multicollinearity among independent variables.

Outliers: very high or very low scores in your data are considered outliers by regression model. In this case outliers were detected through mahalanobis Distance. Tabachnick and Fidell (2011) suggested some guidelines to check critical value of mahalanobis based on number of independent variables. In this case when the predictors are five, this value should not be more than 20.52. But in the above table we can see the case number 42 has 34.818. The same result was shown in the graph. Indicating one outlier. But since the sample size is quite enough and we have only one outlier so we don't need to worry about it. We can still run the analysis with this value.

Linearity: The relationship between residuals and predicted values must be linear and this can be checked with Normal p-p plot of regression standardized residuals. The straight line in above graph depicts the existence of linearity among dependent and independent variables.

Normality: This refers to the normal distribution of your variables. The assumption is met when the graph shows residuals are normality distributed by bell curve. In this case the histogram is in pure bell shape, depicts the normal distribution of residuals.

Homoscedasticity: when the random disturbance in the relationship between independent and dependent variable is same across all value of independent variable the situation is known as homoscedasticity. The violation of this assumption occur when the size of variance varies across the values of independent variables. And the assumption was tested with scatter plot which shows spots are diffused and do not form any linear or curvilinear pattern. Hence, proved there's no violation of this assumption in the model.

The very first table of multiple regression shows the variable entered and variables removed. All the variables were entered at the same time and no variable was removed. The method used was "enter method" which indicates type of multiple regression i.e. standard.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.942[a]	.887	.883	3,513.22420

a. Predictors: (Constant), Foreign_Direct_Investment, Interest_rate, Exchange_Rate, Inflation_Rate, Govt_exp

b. Dependent Variable: KSE_100

The second table model summary represents R, R square and adjusted R square. Which shows correlation and variance among variables. As per the results, the .887 variance in KSE-100 INDEX is due to the changes of these five predictors FDI, Interest rate, Exchange rate, and Inflation rate and government expenditures. R is .942 showing the relationship between KSE100 and other five predictors is very strong which mean the shared variance is highly fit model.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	8479.852	2940.404		2.884	.005
	Interest_rate	-2176.478	223.619	-.503	-9.733	.000
	Govt_exp	1.854E-005	.000	.258	3.261	.001
	Inflation_Rate	60.123	108.389	.030	.555	.580
	Exchange_Rate	301.552	42.702	.500	7.062	.000
	Foreign_Direct_Investment	8.065E-006	.000	.157	4.783	.000

a. Dependent Variable: KSE_100

According to the above model, standardized Beta of interest rate is -.503 indicating strong contribution in explaining the variation in KSE-100 INDEX. And the t value and significance (p) value which is -9.733 and .000 respectively; this value being less than 0.05 leads to the result that hypothesis:

H1: interest rate has significant relationship with KSE-100 INDEX is accepted.

This is presumably due to the fact that when interest rates rise, cost of borrowing for businesses rise and hence it adversely affects their overall financial health and profitability. It also motivates investors to invest in fixed income securities rather than stocks which, in turn, causes stock prices to drop.

Government expenditure accounts for .258 changes in KSE-100 INDEX and its t value and p value are 3.261 and .001 respectively. Leads to the results that hypothesis

H2: government expenditures have significant relationship with KSE-100 INDEX isaccepted

Government spend for the public to boost the economy by building infrastructure, roads, public property etc. which creates employment resulting in the increase in purchasing power. Ultimately it leaves a positive impact on stock prices

There's a minor variation in the value of KSE-100 INDEX due to inflation i.e. .030. And the t value and p value are .555 and .580 which is more than 0.05. Hence leads to the result that hypothesis

H3: There is no significant relationship between inflation and KSE-100 INDEX is accepted

Traditionally, inflation has appeared to have a significant impact on stock performances, however, the results of this research shows no significant impact. This may, presumably, be because inflation rate in Pakistan has been relatively more stable in the last decade and hence did not leave much impact on KSE-100

INDEX. As the exchange rate accounts for .500 changes in KSE-100 INDEX and its t value is 7.062 and p value is .000. These values lead to the result that hypothesis

H4: Exchange rate has significant relationship with KSE-100 INDEX is accepted

The second highest contribution in explaining the variation in KSE-100 INDEX is by exchange rate. It is due to the fact when this rate rises, purchasing power of foreign buyers also rises because they invest the same amount in local currency but after the conversion, amount will increase and they can purchase more stocks than earlier so ultimately it gives more liquidity to the market.

As it can be seen that .158 changes in KSE-100 INDEX are due to FDI and the t value is 4.783 and p value is .000 which leads to the result that hypothesis

H5: Foreign Direct Investment has significant relationship with KSE-100 INDEX is accepted

The earlier studies showed a strong positive impact of FDI on stock market. But this research depicts FDI has low and negative relationship with KSE-100 INDEX. This is against the relationship depicted in the literature review and is an unexpected result.

Conclusion

As it is known that the stock market has a significant portion in the development of the economy. If the stock market performs efficiently, the economy will tend to be efficient. In order to analyze the performance of Pakistan Stock Exchange, this research project explored the macro factors which are highly responsible for the performance of KSE-100 Index.

In the light of the results highlighted in the previous discussion, following conclusions are drawn: the exchange rate and government expenditure have strong positive and significant relationship with KSE-100 INDEX while. Interest rate has strong negative and FDI has weak negative correlation with KSE100. But the model depicts both have significant relation with KSE-100 INDEX. The results also depicts inflation has negative and insignificant impact on KSE-100 INDEX. According to the findings, interest rate and exchange rate have high contribution in explaining the variation in KSE-100 INDEX. i.e. -.503 and .500 respectively. After these, government expenditures are accountable for only .258. And the other two variables do not have major contribution.

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