Examination of the relationship between Gold prices, Oil prices, Exchange rates & Interest rates with Stock returns in Pakistan

MBA RESEARCH PROJECT

Submitted By: Tazeen Rashid
Supervised By: Ms. Saadia Irfan
NUST BUSINESS SCHOOL MBA THESIS

Forwarding Sheet

I, Ms. Saadia Irfan, confirm that this thesis which is submitted as a partial degree requirement is the original work of my student, Tazeen Rashid. I am glad to supervise this thesis and am very satisfied by the contribution it has made to the literature.

SUPERVISOR: Saadia Irfan

Signature:

Date: 29th January, 2016

Declaration Statement

I confirm that this thesis which is submitted as a partial degree requirement is my own original work. I am genuinely glad to have contributed to the literature and the industry by conducting this study and I hope it helps beneficiaries in their investment decisions.

TAZEEN RASHID (NUST201464318MNBS75614F)

Signature _____

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Abstract

With the increased acquaintance and interest in investing, investors are getting more conscious about gaining the knowledge regarding which markets offers the relatively more secure investment opportunities in this volatile and uncertain environment. Therefore this research project pursues to find out and analyze the impact of the four of the most important and discussed variables that can have impact on the stock market returns including currency exchange rate, gold prices, oil prices and interest rates. The data of these variables has been taken from Pakistani market for the period of 2008 to 2015. This paper analyzes the short-term and the long-term impact of these variables on stock returns individually as well as their combined effect.

The study is structured as follows: the first section specifies contextual information about the research study and what has been uncovered by researchers throughout the world in explaining the relationship between the chosen variables and then the variables are discussed; the second section is about the research methodology and a theoretical framework. Then this paper progresses to the results by using some major and basic types of analysis tools of statistics i.e. Correlation, Simple Regression Modelling and Multiple Regression Modelling and Descriptive Statistics, gives an exhaustive investigation and comparison of data gathered with the already prevalent literature in this regard. In the end, our research study settles with the hypothesis testing, with concluding remarks and possible reasoning of the relationship between the variables.

Keywords: Correlation, Multiple Regression Model, Stock Market, Interest Rate, Karachi Stock Exchange and KSE-100 Index, Oil returns, Gold returns, Forex returns.

Introduction

After the bruited financial crises, there had been a lot of investigations on the factors that determine or boost investment portfolio's performance from the researchers around the world. Several approaches of investment have been scrutinized and Gold, Oil, currency and stocks have been

identified as some of the most popular types of investment that yield stable returns even during crises. With this, a debate about their inter-relationship and correlation has also popped up. We'll start with a brief introduction of each of these investment tools:

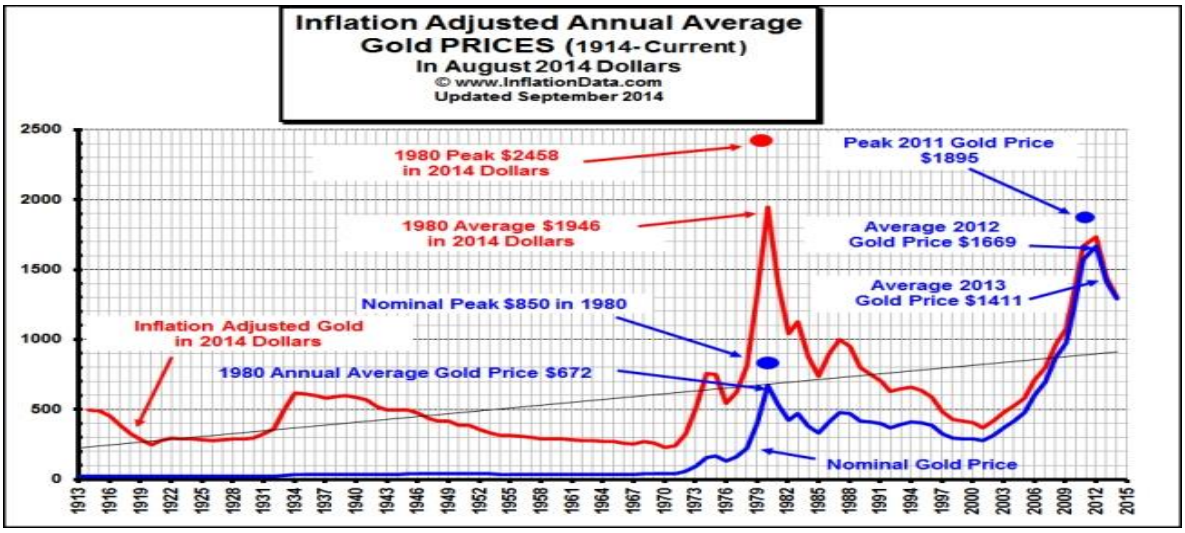
Gold

Gold is considered one of the most old and secure form of investment. It has been most commonly bought as a hedge or anchorage against economic, political, or social and currency crises (including investment market declines, burgeoning national debt, currency devaluation, inflation, war and social unrest or even one's own tight financial condition). The gold prices have always been in news and investors always try to predict it but no solid model has been identified for this purpose, most probable cause of which could be the efficiency of gold market.

The mechanisms for investing in gold are simple and convenient. One option could be the purchase and possession of bullion, or gold coins. But these holdings have holding costs and safety concerns. The prices of gold are very volatile and thus the bid and ask spread may increase so much that the realized return after deducting expenses would be so low. These mechanisms may also result in low yield except when the investor chooses to transact frequently, which then create transaction costs. Another option is investing in gold futures contracts are traded on commodities exchanges. But these contracts require special expertise, capital, and experience than what many retirees could wish to commit to futures trading. And futures trading has just started in Pakistan, it will take time to develop this market to earn higher yields. Other than these, investors can also invest in gold by the two gold-based mutual funds in Pakistan: Atlas Gold Fund and UBL Gold Fund.

A general high demand of gold in Pakistan is due to its security as gold offers a safe haven as long as it is retained by central bank and thus it has no credit risk. Secondly, gold is able to maintain its liquidity even at times of crisis situations like high global inflation or political turbulence. It also offers value in making a diversified portfolio.

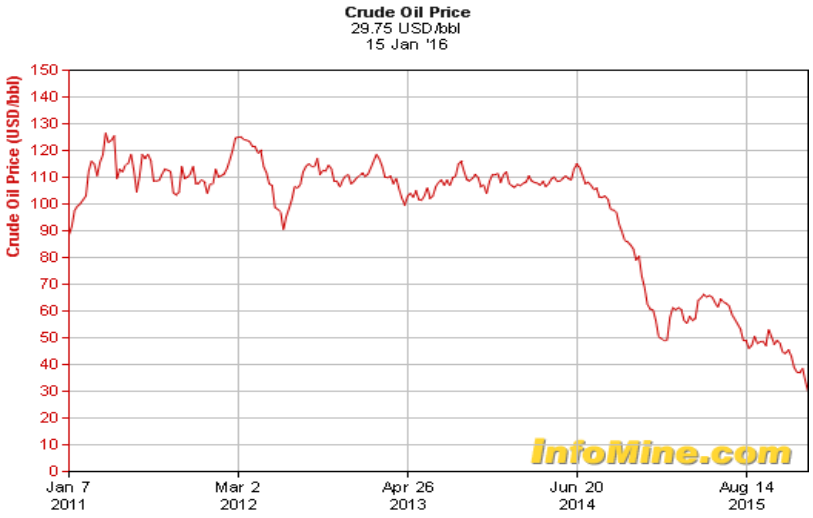
But in recent years, the gold prices has been low due to international subdued demand of gold. Internationally, the gold demand has declined in recent years majorly because of India and China; the two dominant players in global gold market. World Gold Council (WGC) has showed in recent



reports that extreme weather patterns in India overshadowed the gold demand in India which had a direct impact on incomes in the rural population, which accounts for more than half of the Indian gold demand. And in China, the reason for lowering demand has been attributed to domestic economic conditions and stock market volatility. (Alam K. , 2015).

Crude Oil

Crude oil is an essential resource in today's world. As we are heading towards energy crisis, crude oil's importance has increased around the world. It impacts economic condition of companies directly by raising their cost of production (esp. of manufacturing sector) and indirectly through inflation.[1]



In the recent years, oil prices have seen a very volatile trajectory and it is believed to impact various other macro-economic variables. But, as the case with gold as a commodity, oil prices are determined by international oil prices. In recent years, the oil prices have seen a declining trend internationally, due to a lot of reasons, the most important ones are: the plummeted imports by the largest importer of oil i.e. America as it has now started making its own oil; the continuous high production which has made supply much greater than

[1] Mabro (2006)

demand; the shift towards using other fuels; the bearish sentiments of the investors. (E.L., 2014).The global oil price trend is shown here from InvestmentMine website. (5 Year Crude Oil Prices and Price Charts, 2016)

There are various mechanisms of investing in crude oil. One is through futures or options contracts but they required special expertise and capital and are very volatile and risky; are thus difficult to be managed by an average investor. Another option is investing in equity market by buying stocks of oil companies. These companies constitute a large amount of our stock exchange and they offer high dividend returns as well as liquidity. A recent launch of Pakistan's Exchange traded funds (ETF) have now added another way to invest in oil sector. (Keeler, 2015)

Forex

The forex market is a decentralized global market that is used for currency trading. Around the world, many investors and financial centers take part in it. The buying and selling determine the demand supply basis through which currency spreads are determined. The forex rates depend upon many macroeconomic and political factors[2].

Investors can indulge in forex investments through various ways: by holding the currencies itself; through foreign currency options, forward and futures contracts, exchange traded funds (ETFs) and exchange traded notes (ETNs), Eurobonds, certificate of deposits, and many others. The forex markets have been known for their high liquidity, returns, leverage, and relatively simpler to understand and learn. There are many forex brokers and dealers in Pakistan and thus, this is one of the relatively developed market here.

[2] *International Business Times (*2011) *What is Foreign Exchange?*"

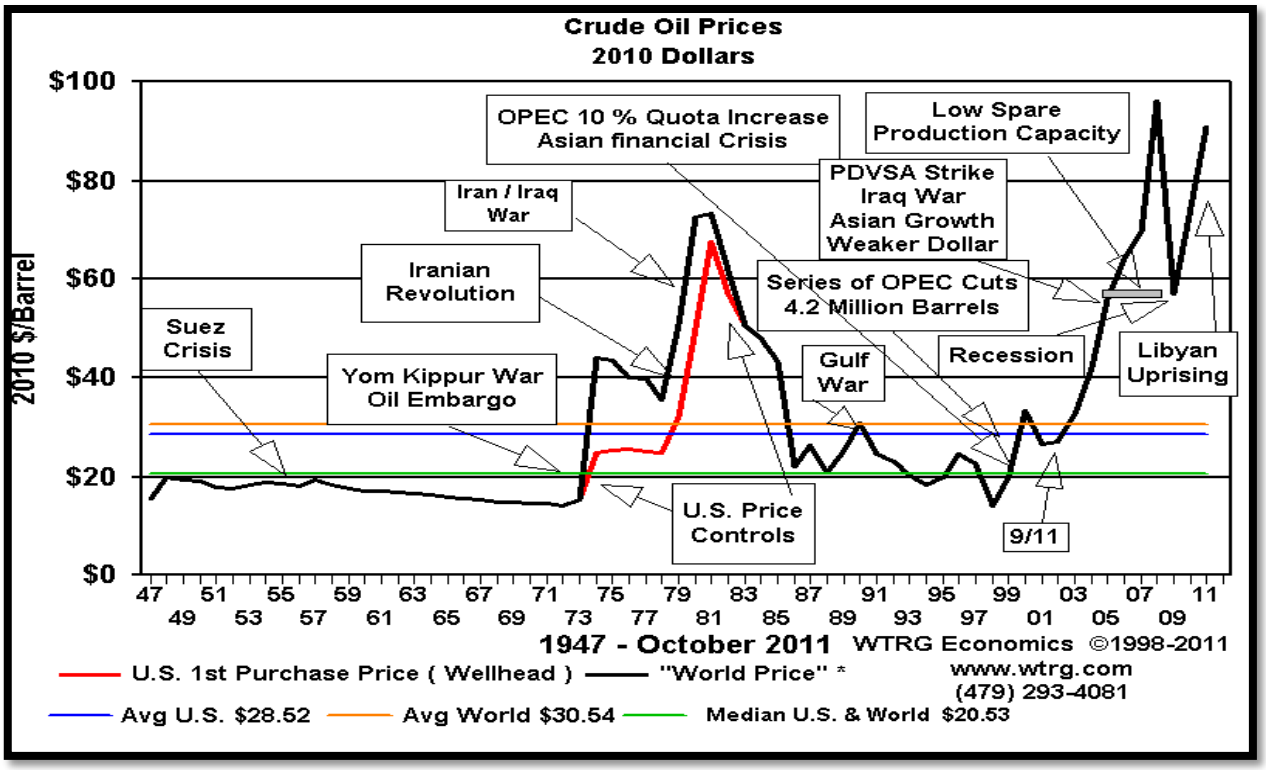
Interest Rates

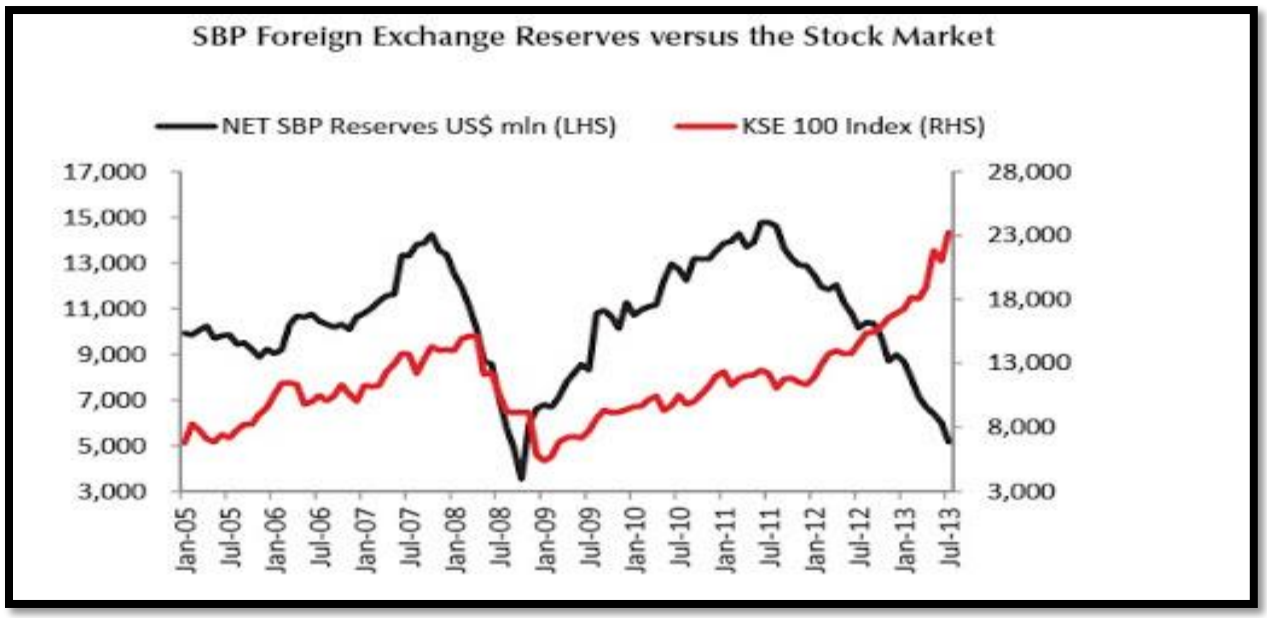
Interest Rate in a country is the rate that its central bank charges commercial banks and other financial institutions for money that the central bank lends to them. The State bank of Pakistan manage and report interest rates. It has seen a declining trend as state bank was trying to cater to inflation and boost consumer spending and to fuel up country's economic growth rate. In 2015, it reached the lowest point since August 1973. (report, 2015)

Stocks

Pakistani stock market was divided into three main stock exchanges: Karachi Stock Exchange, Islamabad Stock Exchange and Lahore Stock Exchange, until recently when they have been combined to form one stock exchange: Pakistan Stock Exchange; headquartered in the capital, Islamabad. Although the country is still considered as an under-developed economy, its nascent stock market has been rewarding both local and foreign investors with ridiculously high returns. It has given the return of upto 52.20% in 2013.

Stocks are liquid securities and can be easily bought or sold.[3] This makes stock markets very convenient and lucrative investment opportunity. The stocks give returns in both dividends form and capital gains. Stock market is also considered as the driver of economic growth. Hence, analyzing and understanding stock market returns is the core of this study.


Crude Oil Prices
2010 Dollars
2010 $/Barrel
$100
$80
$60
$40
$20
$0
OPEC 10 % Quota Increase
Asian financial Crisis
Low Spare
Production Capacity
PDVSA Strike
Iraq War
Asian Growth
Weaker Dollar
Iran / Iraq
War
Iranian
Revolution
Series of OPEC Cuts
4.2 Million Barrels
Suez
Crisis
Yom Kippur War
Oil Embargo
Gulf
War
Recession
Libyan
Uprising
U.S. Price
Controls
9/11
47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77 79 81 83 85 87 89 91 93 95 97 99 01 03 05 07 09 11
1947 - October 2011
WTRG Economics ©1998-2011
www.wtrg.com
(479) 293-4081
U.S. 1st Purchase Price (Wellhead)
"World Price" *
Avg U.S. $28.52
Avg World $30.54
Median U.S. & World $20.53


SBP Foreign Exchange Reserves versus the Stock Market
NET SBP Reserves US$ mln (LHS)
KSE 100 Index (RHS)
17,000
15,000
13,000
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28,000
23,000
18,000
13,000
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3,000
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Jul-13

Literature Review

There is an abundance of literature available on the chosen variables. The relationship between exchange rate and oil has been analyzed by many researchers, together with the correlation between the exchange rate and gold. Furthermore, the relationship between stock market returns and exchange rates, the yields of the stock market and gold and the returns of the stock market and oil has also been investigated in a comprehensive model to explain the relationship these variables share with each other.

Gold and Stock Market

The natural resources such as gold has always had its significance both in political and business circles (Bernard, et al., 2005). The utilization of gold as a speculation does a reversal to the early ages, finding full points of interest in the legends of Midas and Lydia. Just as of late, on the other hand, analysts have started to research the danger/return characteristics of gold with cutting edge factual strategies. Terence C. Mills examined the factual conduct of the everyday gold returns from 1971 to 2002. He found that gold returns are very volatile and leptokurtic. (Mills, 2003) Due to this volatile nature, gold has been the subject of much research for quite a long time and unpredictability in gold returns has attracted numerous researchers as a variable to ponder. One main study is of (Herbst, 1983), who found that in the period (1800-1976) gold returns essentially failed to meet expectations as a single investment, but, Herbst also concluded that due to its statistical properties (i.e. negative correlation with stock returns), gold might be a sensible interest in an enhanced portfolio. Many other studies have found that the three valuable metals have low relationship with the stock returns and thus recommend that these metals can reduce unsystematic risk. (Chua, Sick, & Woodward, 1990) They likewise found that valuable metals such as gold display some capacity to cover amid times of strange business sector instability. Mishra, Petal (2010) endeavored to investigate causation that can keep running between local gold returns and yields of the securities market in India, considering gold returns and showcase returns on household securities in view of the BSE 100 record for the period between Jan 1991 and Dec 2009. The examination of the variables demonstrated the presence of negative correlation between these variables.

Oil and Stock Market:

Changes in the oil prices are often viewed as imperative for comprehension of stock market volatility. On October 12th 2006, the Financial Times Newspaper showed solid fixations in worldwide stock exchanges because of a drop in oil prices that day. Regardless of these perspectives broadly held among investors, there is no agreement on the relationship between oil prices and stock returns among financial analysts. Kling (1985), for instance, argued that the expansions in oil spreads are connected with stock returns' decreases. Chen, Roll and Ross (1986), on the other hand, recommended that these two have no significant relationship. Jones and Kaul (1996) reported a steady negative relationship between changes in oil prices and stock returns. Huang, Masulis, and Stoll (1996) also had results in line with Jones and Kaul's study. Hasan and Nasir also did an extensive research on various countries for period of June 1998 to June 2008 and found that oil prices are not statistically significant in determining equity prices in the long run. (Hasan & Nasir, 2009)

A vast literature has been found on the relationship of oil prices and economic growth and productivity in many developed and emerging countries (Gronwald, 2008).The chronicled data of US shows that oil prices vacillations could extraordinarily affect the economy and stock returns. The most well-known conclusions of different investigations demonstrates that a hike in the oil prices prompts a bearish trend in stock markets and vice versa.

In addition, the majority of these studies have concentrated on some industrial nations, for the most part the US, Canada, Europe and Japan [Jones and Kaul (1996), Huang et al. (1996) and Sadorsky (1999)]. The drawings of these studies are uncertain. As of late, a few studies have concentrated on European markets, Asian and Latin American. They have demonstrated a huge connection between transient changes in oil returns and these developing securities markets. For instance, Papapetrou (2001) applied modeling error correction vector to study the effect of oil prices on the profitability of the shares of Greece using daily data and variance decomposition. The study recommends a negative impact of oil costs on stock return. Basher and Sadorsky utilized a new multi factorial model and achieve the same conclusion for other developing countries' stock markets (Basher & Sadorsky, 2006). (Sadorsky, 1999) gathered monthly data to explore the relationship between these two variables in the US from January 1947 until April 1996. The

difference disintegration model was used. The discoveries propose that these variables are adversely related in the short term, which implies higher oil returns lead to lower share prices.

Anoruo Mustafa (2007) analyzed the relationship between yields of oil and US stocks taking day by day information, bi-Johansen Co reconciliation variable, and the center blunder rectification. The outcomes demonstrated the long-run relationship in these variables in the US. The vector model estimated error correction (VECM) gave proof of causality of stock returns and oil and not the converse. The tests give proof that both these variables are co- integrated. The researchers noticed this outcome infers that both markets are coordinated and move in opposite direction. Narayan and Narayan (2010) surveyed the relationship between oil costs and stock costs in Vietnam with every day arrangement from 2000 to 2008. Applying the Johansen test, the outcomes give proof of oil returns and share prices for Vietnam share a long haul relationship. Some other studies suggest that there may be a short-term relationship between these two but no long run relationship.

Exchange Rate and Stock Market

A causal relationship running from trade rates to stock costs is proposed by many studies. In accordance with the methodology used by Granger, Huang and Yang (2000), changes in conversion rate can influence the performance of companies and thus, their income and share returns are influenced. From one viewpoint, local money devaluation causes less expensive exports and vice versa, and prompts a change in demand. As we know, exports have an inverse relationship with currency movements. And such relationship is the inverse for importing firms. Moreover, this additionally applies if loads of imported inputs are utilized as a part of their manufacturing. With currency devaluation, their manufacturing costs rise and benefits may decay. Thus, a fall in their stock returns might result. Specifically, developments of forex rates have impact on company's future payables (or receivables) that are designated in any other currency. The local currency's appreciation would then diminish benefits of the exporter and devaluation of domestic coin would create benefits.

Setting up a relationship between forex rates and stock returns is vital for a few reasons. Gavin (1989) demonstrates that a positive and increasing trend in equity securities induce that country's currency demand. Furthermore, the connection between the two markets can be utilized to anticipate the future trend of forex returns. Multinational undertakings will get benefited by

reducing risks. Thirdly, forex markets are usually involved in investors' portfolio to diversify it. Thus information about the relationship between these two is key to better returns from such funds.

Most studies that attempt to clarify changes in offer costs and trade rates are keen on finding a high recurrence, and a measurable relationship. (Ajayi & Mougouė, 1996) researched the short and long haul relationship between stock costs and trade rates in eight propelled economies like UK and US. They find that an inverse relationship between the two. They concluded that local money devaluation prompts a diminishing trend in stock returns in the short term. Granger, Huang and Yang (2000) gathered data on some of Asian nations and came up with uncertain findings.

Tahir (2004) looks at the observational relationship among four stock records and the conversion scale at Karachi Stock Exchange (KSE). The variables utilized as a part of this archive are non-stationary and stationary at first contrast and the outcomes depend on the system of cointegration Johanson. The outcomes got utilizing this system there is dependably a cointegration relationship between the variables and there is likewise prove that stock lists and trade not move together over the long haul. Another study of Karachi stock exchange (KSE) revealed a linkage between stock market general index and the exchange rate and this linkage is two-sided which means each of these triggers and affect the other one. (Farooq, Keung, & Kazmi, 2011)

Interest rates and stock market

Both stock markets and interest rates are considered significant factors for driving an economy and a vast literature exists in determining the impact these two have on each other. Mahmudul Alam and Gazi Salah Uddin, for instance, studied this relationship for fifteen developed and developing countries- Australia, Bangladesh, Canada, Chile, Colombia, Germany, Italy, Jamaica, Japan, Malaysia, Mexico, Philippine, S. Africa, Spain, and Venezuela. Time series and panel regressions were runned and it was found that these variables have significant negative relationship. So, if interest rates are controlled by the government, stock returns can be increased. (Alam & Uddin, 2009). Another research suggested no causality between the two in long term. Monthly U.S. data for 1959–1979 and 1979–1983 was taken in this study and the relationship between conditional mean and conditional variance is reliably positive only at the short end of the term structure. (Campbell, 1987).

(Ali, 2014) suggests an inverse relationship between these two after analyzing Karachi Stock Exchange (KSE) of Pakistan for the period of Jan 2004 to Dec 2013. Correlation, Regression analysis and descriptive analysis were used in this study. Whereas, another research in same region; Pakistan has concluded in no relationship between these two. Data from Karachi Stock Exchange 100 index, and monthly rates of six monthly T-bills for the period of 1994 to 2014 were used for short term interest rates and Granger Casualty test has been conducted. The results came out as neither stock markets affect interest rate nor vice versa. (Hussain, Zaman, & Baloch, 2014)

Another journal article confirms the same results that interest rate have inverse relationship with investment. Data was taken from Pakistan for the span of 1964 to 2012. (Muhammad, Lakhan, Zafar, & Noman, 2013). Abdul Wahab Farooqi explains that increase in interest rate causes decrease in stock prices because required rate of return on stocks rises which causes decrease in stock prices. Co-integration result suggests the existence of negative long-run relationship between interest rate with stock prices. It was then suggested that investors should not invest in stock market when interest rate is highly volatile. (Farooqui, 2015)

Expected Relationship

In the literature, some studies took the same variables like this study has and tested in different markets. For example, Gunes et al.(2010) studied to clarify the ascent gold prices have by taking the oil prices, euro-dollar returns and interest rates as independent variables. The paper illustrated the gold price information for a period of ten years from 2000 to 2009 and took the Granger-Causality test, the outcomes demonstrated that there is no long-run connection between these variables.

Adebiyi, M.A (2009) took oil, exchange rate and stock returns as his study variables in Nigeria for the time period of 1985-2008 and as indicated by the observational consequences of their study, there was a prompt and critical negative between oil and stock returns of Nigeria especially in short term. Besides, the Granger causality test additionally showed that volatility of stock market is due to variation in oil prices.

Another study took similar variables of oil, gold, forex and stock indices and data was taken from European market from 1999 to 2010 (Salazar and Lima, 2010). Results from their study recommended a long-run relationship between usd/eur and other specified variables.

Connections between Oil Price, Gold Price, Exchange Rate and International Stock Markets has been analyzed by yet another paper by, Wang, M. Wang,C. Huang,T (2010), that tried to the effects of vacillations in these variables from the markets of the United States, China, Germany, Taiwan and Japan and in addition the long and transient connections among these variables was scrutinized. The conclusions of the study were that there exists correlation among changes in oil, gold and trade rates and the securities exchanges in Germany, Japan, China and Taiwan in the long haul. While there was no relationship found among these variables in the U.S. securities exchange.

Overall, most of literature found evidence of relationship between gold, oil and forex returns in the short term. Gold and oil returns are proven to be negatively correlated with stock market and forex market, on the other hand, has depicted positive relation. Interest rates' evidence is mostly inconclusive. But, in longer term, we have mixed and unclear conclusions and that is why this study has tried to explore the relationship in both long and short term to have the best guidance for investors.

Research Aims & Objectives

Research Purpose and Problem Statement

Stock markets have always been very volatile and obscure and no single instrument or formula has proven to be helpful in predicting its movement consistently. With this study, the aim is to come out with some conclusions on which factors explain stock price movements and how much those factors can affect equity markets. Hence, this research mainly aims to explore the correlation between gold prices, oil rates, exchange rate, and interest rates with Karachi stock exchange 100 index; which is the best representator of Pakistani stock market amongst other indices. Also, the interrelationships among these variables have also been tested for both short term and long term to understand it in more depth.

Research objectives

This study has been run with the following stated objectives:

- To check out any correlation between gold prices and stock prices?
- To check out any correlation between exchange rate and stock prices?
- To check out any correlation between oil prices and stock prices?
- To check out any correlation between interest rates and stock prices?
- To analyze the extent with which all these variables collectively impact the Pakistani stock market?

Hypothesis

The hypotheses of this study are:

H_{o1}: There is no impact of gold prices on stocks in short term.

H_{o2}: There is no impact of oil prices on stocks in short term.

H_{o3}: There is no impact of exchange rates on stocks in short term.

H_{o4}: There is no impact of interest rates on stocks in short term.

H_{o5}: Gold Prices, Oil Prices, Exchange Rate and Interest rates together have no impact on Stock Prices in short term.

H_{o6}: There is no impact of gold prices on stocks in long term.

H_{o7}: There is no impact of oil prices on stocks in long term.

H_{o8}: There is no impact of exchange rates on stocks in long term.

H_{o9}: There is no impact of interest rates on stocks in long term.

H_{o10}: Gold Prices, Oil Prices, Exchange Rate and Interest rates together have no impact on Stock Prices in long term.

Research design & Methodology

This study is based on secondary research, which means that the data for testing has been collected from various Internet sources. To make this study more authentic and accurate, the focus was on collecting all required data from national and governmental portals. The literature review is primarily constructed from the published articles on famous portals e.g. Jstor.

Numerical and quantitative analysis was done on Microsoft Excel. Two types of computations were used: correlation and single and multiple regressions. To understand data characteristics, descriptive statistics were also analyzed. Correlation helps in understanding the dependence between any two variables. Each variable has been analyzed by determining its correlation with the dependent variable.

Multiple regression Model (OLS) was also applied to find out not only direction but also the extent of impact each variable has on the stock market as well as on each other's price.

The analysis has been divided in two parts: short term and long term. Monthly data has been taken for each variable in short term study for the period of 2008-2015; eight years. For long term, annual data has been taken for the same period of 2008-2015. The following analysis has been performed:

- A general trend analysis
- Descriptive statistics
- Correlation analysis
- Regression modelling which include Simple as well as Multiple Regression.

Theoretical model:

Stock prices = f (gold prices, oil prices, exchange rate, interest rate)

$$Y_t{}^{sp} = a + b_1 X_t{}^{gp} + b_2 X_t{}^{op} + b_3 X_t{}^{er} + b_4 X_{t\,ir} + e_t$$

Where:

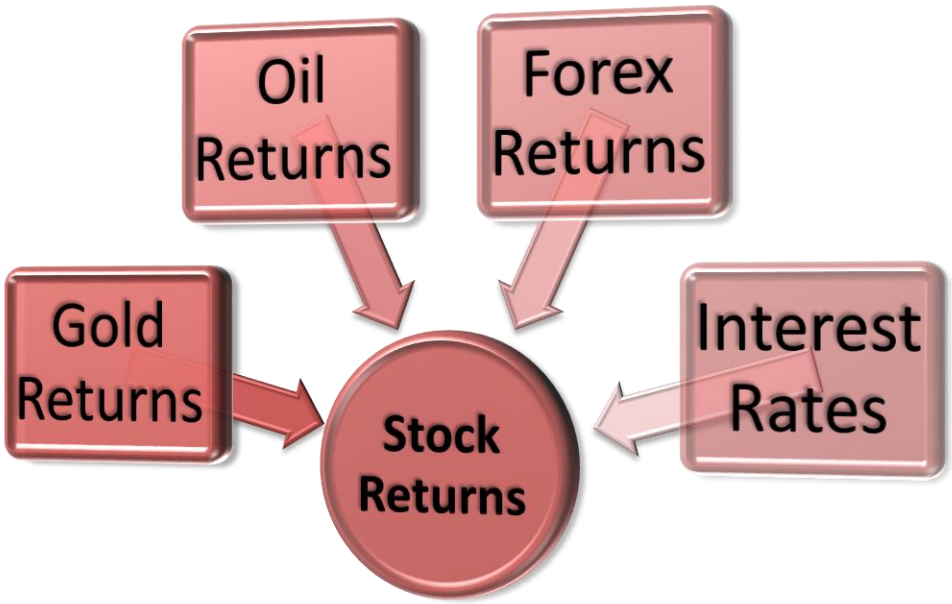
$Y_t$sp is the Stock returns

$X_{t\,gp}$ is gold price returns

$X_{t\,op}$ is Old price returns

$X_{t\,ir}$ is Interest rates

And e_t is the random forecasting error.



Analysis and Discussion

This study has been divided into two parts; short term analysis of the theoretical model and the long term analysis of it. The basic purpose was to examine the relationships in a deep way so that more helpful generalizations could be made. All variables are same for both the parts but the data points were different. As discussed previously, in the short term study, monthly data points have been gathered and analyzed. In the second part; long term, annual data has been taken. So, for each variable, in part one of the analysis we considered investor returns when investing for a month and in the second part, we took investors return as if the he/she invested at the 1st of January and get off that investment after the end of that year. This section will now proceed by short term analysis of research hypotheses. After that, long term analysis has been undertaken.

PART 1: SHORT TERM ANALYSIS

Correlation, Descriptive and Regression Analysis

Correlation Analysis:

	GOLD RETURNS (X1)	OIL RETURNS (X2)	FOREX RETURNS (X3)	INTEREST RATES (X4)	KSE- RETURNS (Y)
GOLD RETURNS (X1)	1				
OIL RETURNS (X2)	0.16745	1			
FOREX RETURNS (X3)	-0.14835	-0.06753	1		
INTEREST RATES (X4)	0.30609	0.09541	-0.12715	1	
KSE- RETURNS (Y)	-0.24683	0.24327	0.19256	-0.10407	1

Correlation is used to determine how much any two variables are related. The table shown above is a correlation matrix which shows the extent of relationship between entered variables. Here, I have checked the correlation between every single variable so that if there was a significant correlation between the independent variables, necessary steps could be taken to avoid inaccurate and faulty results.

The column 1 of the above table shows that in short term, the gold returns in Pakistani market does not correlate with any of the other chosen variable. A strong correlation lies between 0.7 to 1 or -0.7 to -1. But, gold returns are negatively correlated with forex returns and KSE stock returns. The

correlation of Oil returns is shown in Column 2. Oil returns are also not significantly related to any of these variables. Similar results are found in column 3 and 4.

Overall, no significant correlation has been found between any of our dependent and independent variables. This low correlation makes gold a useful portfolio diversifier for investors in our market. These results are consistent with the literature.

Descriptive Analysis:

Descriptive analysis is used to understand data characteristics. It is considered to be an essential tool for quantitative analysis of any data. Here, it is being used to evaluate the risk and volatility of all three markets under consideration i.e. gold, oil and forex and debt market (through interest rates).

	X1:Gold Returns	*X2: Oil returns*	*X3: forex returns*	*X4:Interest rate*	*Y: Stock Returns*
Mean	0.00940	0.00161	-0.45720	0.11005	0.03977
Standard Error	0.00415	0.00891	0.14131	0.00234	0.03807
Median	0.00840	0.01445	-0.19486	0.11150	0.05532
Mode	0.02610	0.05960	#N/A	0.09000	#N/A
Standard Deviation	0.04062	0.08734	1.38456	0.02296	0.37301
Sample Variance	0.00165	0.00763	1.91700	0.00053	0.13914
Kurtosis	0.15817	1.40808	6.29914	-0.70390	20.78781
Skewness	0.44424	-0.72517	-0.99965	-0.36525	-3.35405
Range	0.19130	0.45740	11.00237	0.08950	3.37881
Minimum	-0.06590	-0.25970	-5.98416	0.06000	-2.44585
Maximum	0.12540	0.19770	5.01821	0.14950	0.93296
Sum	0.90192	0.15466	-43.89097	10.56442	3.81802
Count	96.00000	96.00000	96.00000	96.00000	96.00000

The table shows that the data used spreads over a span of eight years starting from January 2008 to December 2015 which makes a count of 96 months. A close to 100 observations would give more reliable generalizations.

The mean is a single value which represents the data over the taken period. Gold, oil and stock returns have been low overall if we consider mean value. Forex returns have been significantly negative because Pakistani currency was continuously depreciating over these 96 months. Interest rate was 11% on average.

Standard deviation shows that Forex market and stock market has been extremely volatile and risky but gold, oil and interest rates have remained consistent. This shows that gold and oil markets are more for investors who want average but fixed returns and on the other hand, forex and stock markets are attractive for investors who are willing to take higher risks for higher returns.

The shape of the data distribution is close to the normal distribution as the skewness of all independent variables is close to zero. However, the skewness of stock returns is less than zero which indicates that their distribution pattern has a tail extended towards the left side of the mean. The tail of oil, forex and interest rate distributions are also extended slightly towards the left side of the mean which means that most of the data points have been below mean. Another measure of distribution, kurtosis, shows that forex returns and more especially the stock returns have extreme values in their data and hence their distribution is relatively peaked.

Regression Analysis:

The Correlation analysis only tells about the strength of relationship between two variables, it does not tells about the magnitude or lead/lag of the relationship whereas regression analysis tells about both. So, in addition to correlation, regression was necessary to be carried out. Both simple regression (for individual relationships) and multiple regression model has been used.

1. *Gold Return and KSE Stock Returns:*

Regression Statistics								
Multiple R	0.246834655							
R Square	**0.060927347**							
Adjusted R Square	**0.050937212**							
Standard Error	0.363386321							
Observations	96							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.805337788	0.805338	6.098751	0.015332221			
Residual	94	12.41266412	0.13205					
Total	95	13.21800191						
	Coefficients	*Standard Error*	*t Stat*	***P-value***	*Lower 95%*	*Upper 95%*	*ower 95.0%*	*Upper 95.0%*
Intercept	**0.061068808**	0.038077446	1.603805	**0.112112**	-0.014534854	0.136672	-0.01453	0.136672471
X1	**-2.26692502**	0.917945065	-2.46957	**0.015332**	-4.08952646	-0.44432	-4.08953	-0.444323571

The regression analysis between gold and stock returns in short term showed that only 5.09% of the overall sample of stock price movements can be explained by the gold returns in Pakistan. The t-test has been used here as it is best for simple regression. The coefficient figures show that 1% change in value of gold returns causes a decline of 2.26% in stock returns in Pakistan. The p-value is less than 0.05 (i.e. 0.0153), hence the null hypothesis has been rejected. Which means, that gold returns do impact and helps in determining stock returns but as their adjusted R-square is very low, this impact is low.

2. *Oil Return and KSE Stock Returns:*

Regression Statistics								
Multiple R	0.243272265							
R Square	**0.059181395**							
Adjusted R Square	**0.049172686**							
Standard Error	0.363723974							
Observations	96							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.78225979	0.78226	5.91299	0.016924394			
Residual	94	12.43574212	0.132295					
Total	95	13.21800191						
	Coefficients	*Standard Error*	*t Stat*	***P-value***	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**0.038097173**	0.037128804	1.026081	**0.307486**	-0.035622938	0.1118173	-0.0356229	0.11181728
X2	**1.039020085**	0.427287676	2.431664	**0.016924**	0.190630389	1.8874098	0.19063039	1.88740978

Regression analysis shows that oil returns only explains the stock returns by 4.917% (as indicated by adjusted R-square value). The p-value is 0.016 which is less than 0.05, thus the null hypothesis has been rejected and these variables do impact each other but that effect is insignificant. Every 1% change in oil returns causes 1.03% change in stock returns in Pakistani market.

3. *Forex Returns and KSE Stock Returns:*

Forex returns only explain 2.68% of the changes in stock returns. The P-value is higher than 0.05 (i.e. 0.06) which means that the null hypothesis has been accepted in this case. So, in short term, forex returns do not determine stock returns in Pakistan.

Regression Statistics								
Multiple R	0.19256009							
R Square	**0.03707939**							
Adjusted R Square	**0.02683555**							
Standard Error	0.36797153							
Observations	96							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.490115434	0.490115	3.619678	0.060160915			
Residual	94	12.72788647	0.135403					
Total	95	13.21800191						
	Coefficients	*Standard Error*	*t Stat*	***P-value***	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**0.06348913**	0.039570977	1.604437	**0.111973**	-0.015079971	0.1420582	-0.01508	0.142058236
X3	**0.05187713**	0.027267224	1.902545	**0.060161**	-0.002262588	0.1060168	-0.0022626	0.106016838

4. *Interest Rates and KSE Stock Returns:*

Regression Statistics								
Multiple R	0.104068435							
R Square	**0.010830239**							
Adjusted R Square	**0.000307157**							
Standard Error	0.372953248							
Observations	96							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.143154122	0.143154	1.029189	0.312953418			
Residual	94	13.07484779	0.139094					
Total	95	13.21800191						
	Coefficients	*Standard Error*	*t Stat*	***P-value***	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**0.225824755**	0.187304935	1.205653	***0.230977***	-0.146073584	0.5977231	-0.14607358	0.597723094
X4	**-1.69069058**	1.666543287	-1.01449	***0.312953***	-4.999651348	1.6182702	-4.99965135	1.618270178

The t-test has been used here as well. The regression results show that the interest rate and stock returns have no relationship and interest rates cannot be used to forecast future stock prices as the p-value is greater than 0.05; our null hypothesis has been accepted.

5. *Gold Returns, Oil Returns, Forex Returns and KSE Stock Returns:*

Regression Statistics								
Multiple R	0.41735339							
R Square	**0.17418386**							
Adjusted R Square	**0.13788425**							
Standard Error	0.34634099							
Observations	96							
ANOVA								
	df	*SS*	*MS*	*F*	***Significance F***			
Regression	4	2.302362538	0.575591	4.798505	**0.001475093**			
Residual	91	10.91563937	0.119952					
Total	95	13.21800191						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**0.13641442**	0.180230001	0.756891	0.451071	-0.221590338	0.49441918	-0.2215903	0.494419177
X1	**-2.41255381**	0.934506961	-2.58163	0.011431	-4.268837089	-0.5562705	-4.2688371	-0.556270532
X2	**1.28849957**	0.413480774	3.116226	0.002451	0.467170811	2.10982834	0.46717081	2.109828336
X3	**0.04581035**	0.026070667	1.75716	0.082254	-0.005975831	0.09759652	-0.0059758	0.097596524
X4	**-0.50077994**	1.633358328	-0.3066	0.759852	-3.745245608	2.74368573	-3.7452456	2.743685728

In the end, the combined regression analysis of all the independent variables with the dependent variable i.e. stock returns has also been carried out. Results shows that together all of the chosen independent variables only explain 13.78% of the movements in stock prices. This shows that all of these variables do not help much in forecasting stock returns.

Here, F-test has been used as t-test can only determine one co-efficient at a time; f-test is more reliable in multiple regression. The significance F-value is approves the alternate hypothesis. Gold and oil returns changes stock returns of Pakistan by -2.412% and 1.288% respectively by a change of 1%.

PART 2: LONG TERM ANALYSIS

Correlation, Descriptive and Regression Analysis

Correlation Analysis:

	GOLD RETURNS (X1)	OIL RETURNS (X2)	FOREX RETURNS (X3)	INTEREST RATES (X4)	KSE- RETURNS (Y)
GOLD RETURNS (X1)	1				
OIL RETURNS (X2)	0.48937	1			
FOREX RETURNS (X3)	-0.54706	-0.47076	1		
INTEREST RATES (X4)	0.24309	0.44382	-0.41775	1	
KSE- RETURNS (Y)	-0.71406	-0.52055	0.67808	-0.37157	1

In the long term, gold returns had a relatively strong correlation with stock returns but it is negative which means that investors can diversify their portfolio and maximize return by investing in both markets. The oil returns are also intermediately correlated with stock returns. But oil market is also proven to be a good diversifier for portfolio as it has a negative correlation with stocks. The forex returns, however, has a slightly strong positive correlation with stock market in Pakistan.

None of the independent variables is highly correlated with other independent variables which is good as we don't have to deal with multicollinearity.

Interest rates have a quite weak relationship with our dependent variable; stock returns as compared to its relationship with other variables.

Overall, in the long term, it has been proven that gold and oil markets can be used to hedge against a stock investment. And forex movements come in tandem with stock price movements.

Descriptive Analysis:

	X1: Gold returns	X2: Oil returns	X3: Forexreturns	X4:Interest rates	Y: Stock returns
Mean	0.009395005	0.001836854	-0.062215943	0.11004599	0.191425
Standard Error	0.006309346	0.011809683	0.019741861	0.008021434	0.101777818
Median	0.014083333	0.009154167	-0.057901668	0.113677708	0.2227
Mode	#N/A	#N/A	#N/A	#N/A	#N/A
Standard Deviation	0.017845526	0.033402829	0.055838414	0.022688041	0.287871141
Sample Variance	0.000318463	0.001115749	0.003117928	0.000514747	0.082869794
Kurtosis	-1.180776368	0.03092538	-1.222530642	-0.479659248	2.711115207
Skewness	-0.28179231	0.167298627	-0.425237683	-0.632299858	-1.39349728
Range	0.051808333	0.106320318	0.152943828	0.06475	0.9392
Minimum	-0.017966667	-0.047386984	-0.146952155	0.07	-0.4172
Maximum	0.033841667	0.058933333	0.005991673	0.13475	0.522
Sum	0.075160039	0.014694834	-0.497727542	0.880367917	1.5314
Count	8	8	8	8	8

The long term analysis constitute a yearly data for the period of 2008-2015; eight years. The mean tells that the gold and oil returns have remained low i.e. 0.9% and 0.1% respectively and interest rate has remained around 11%. Forex returns have been negative (-6.2%) on average but stock returns were 19%. But, on the other hand, stock market has been the most volatile amongst these as shown by std. deviation.

Skewness shows that except stock returns which had most of the data points on the left side of mean, all other variables had a normal distribution. The kurtosis re-affirms the same that stock returns distribution is peaked and it has extreme values.

Overall, the distributions has been quite normal and thus we can rely on the data and results. Stock market has been the high-risk, high-return opportunity and all other markets have almost remained stable.

Regression Analysis:

1. *Gold Return and KSE Stock Returns:*

The long term regression analysis in Pakistani market explored that the gold returns explain 42.8% of the changes in stock returns. Again, the t-test has been used. The p-value (of 0.046) approves our alternate hypothesis that these two are inter-related. The coefficient value, which is negative, points that every 1% increase in gold returns causes 11.5% decrease in stock returns.

Regression Statistics								
Multiple R	0.714057708							
R Square	**0.50987841**							
Adjusted R Square	**0.428191478**							
Standard Error	0.217682462							
Observations	8							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.29577463	0.295775	6.24186	0.046630861			
Residual	6	0.284313925	0.047386					
Total	7	0.580088555						
	Coefficients	*Standard Error*	*t Stat*	***P-value***	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**0.299642901**	0.088314373	3.392912	**0.014623**	0.083545414	0.51574039	0.08354541	0.515740388
X1	**-11.5186636**	4.610468682	-2.49837	**0.046631**	-22.80007408	-0.2372532	-22.8000741	-0.23725316

2. Oil Return and KSE Stock Returns:

The Pakistani Oil market returns can only explain 14.9% of the changes in stock returns as indicated by the adjusted R-square figure. The p-value (of 0.185) shows that our null hypothesis has been accepted; thus the oil returns do not impact or determine stock returns in the long term.

Regression Statistics								
Multiple R	0.520552149							
R Square	**0.27097454**							
Adjusted R Square	**0.149470296**							
Standard Error	0.265486762							
Observations	8							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.157189229	0.157189	2.230165	0.18595169			
Residual	6	0.422899326	0.070483					
Total	7	0.580088555						
	Coefficients	*Standard Error*	*t Stat*	***P-value***	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**0.199665505**	0.094025802	2.123518	**0.077904**	-0.0304073	0.4297384	-0.030407345	0.429738354
X2	**-4.486205058**	3.004073814	-1.49337	**0.185952**	-11.836909	2.8644988	-11.83690888	2.86449876

3. *Forex Return and KSE Stock Returns:*

The table shows the regression analysis for long term. R-square indicates that exchange rates changes help 36.9% in explaining the changes in stock prices. Similarly, the coefficient values suggest that a 1% change in forex returns would cause 3.49% change in stock returns. But, the p-value approves our null hypothesis as it is greater than 0.05. Hence, we'll conclude that in longer term, stock prices do not get affected much by forex returns.

Regression Statistics								
Multiple R	0.678075964							
R Square	**0.459787013**							
Adjusted R Square	**0.369751516**							
Standard Error	0.22853569							
Observations	8							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.266717184	0.266717	5.10673	0.064565206			
Residual	6	0.313371371	0.052229					
Total	7	0.580088555						
	Coefficients	*Standard Error*	*t Stat*	***P-value***	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**0.408917904**	0.12566414	3.254054	**0.017378**	0.10142883	0.716407	0.10142883	0.716406977
X3	**3.495774454**	1.54693455	2.259808	**0.064565**	-0.289438028	7.2809869	-0.28943803	7.280986937

4. *Interest rates and KSE Stock Returns:*

The interest rates do not impact stock returns of Pakistan in the long term as illustrated by p-value.

Regression Statistics								
Multiple R	0.104068435							
R Square	**0.010830239**							
Adjusted R Square	**0.000307157**							
Standard Error	0.372953248							
Observations	96							
ANOVA								
	df	*SS*	*MS*	*F*	*Significance F*			
Regression	1	0.143154122	0.143154	1.029189	0.312953418			
Residual	94	13.07484779	0.139094					
Total	95	13.21800191						
	Coefficients	*Standard Error*	*t Stat*	***P-value***	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**0.225824755**	0.187304935	1.205653	***0.230977***	-0.146073584	0.5977231	-0.14607358	0.597723094
X4	**-1.69069058**	1.666543287	-1.01449	***0.312953***	-4.999651348	1.6182702	-4.99965135	1.618270178

1. *Gold Returns, Oil Returns, Forex Returns, Interest rates and KSE Stock Returns:*

The combined regression analysis for long term has shown that all of these variables don't impact and cannot determine stock returns as the *Significance F* value is greater than 0.05. Among these variables, the gold returns and interest rates play a relatively bigger role in explaining the sample and population of stock market returns.

Regression Statistics								
Multiple R	0.41735339							
R Square	**0.17418386**							
Adjusted R Square	**0.13788425**							
Standard Error	0.34634099							
Observations	96							
ANOVA								
	df	*SS*	*MS*	*F*	***Significance F***			
Regression	4	2.302362538	0.575591	4.798505	**0.001475093**			
Residual	91	10.91563937	0.119952					
Total	95	13.21800191						
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	**0.13641442**	0.180230001	0.756891	0.451071	-0.221590338	0.49441918	-0.2215903	0.494419177
X1	**-2.41255381**	0.934506961	-2.58163	0.011431	-4.268837089	-0.5562705	-4.2688371	-0.556270532
X2	**1.28849957**	0.413480774	3.116226	0.002451	0.467170811	2.10982834	0.46717081	2.109828336
X3	**0.04581035**	0.026070667	1.75716	0.082254	-0.005975831	0.09759652	-0.0059758	0.097596524
X4	**-0.50077994**	1.633358328	-0.3066	0.759852	-3.745245608	2.74368573	-3.7452456	2.743685728

Limitations and Areas for Future Research

Like every research, there are many limitations because of time, scope and data unavailability constraints. From this study, I have tried to include most of the important variables that can help explain the stock market behavior but other variables like commodities futures, GDP rate and other can be taken for future research purposes as this study has found out that gold, oil and forex markets and interest rates do not help much in explaining stock returns. Also, this study was specifically confined to Pakistani market; more markets could be considered for comparison purposes. And to get more accurate generalizations. Then, the data taken was just eight years, more years could also be taken.

Conclusion and Recommendations

This study took data from after 2008 financial crisis to find out the recent trends of stock market, after the crisis. The results show that forex market and stock markets follow a very peculiar and volatile trend while gold and oil markets are more for savvy investors who want consistent returns. In Pakistani market, the gold, oil and forex markets have very little impact on stock market in short term but they do have a weak relationship. In short term, the gold and oil returns have the most significant impact on stocks but they also do not help much in predicting future stock returns. However, in the long run, all of these factors combined do not impact stock returns much and even in the long term, gold returns have the relatively most significant impact on stock market returns. This could be due to the fact that investors and general public have always used gold when stock markets go through downward trajectory. Both of these (gold and stock) can be taken to optimize portfolio returns as they have negative correlation.

The results also show that forex returns have remained negative on average in both short and long term; hence Pakistani currency might not be a good investment tool. Money market funds can be a good opportunity for stable and positive returns. Talking about their relationship with stock returns, a strong long term correlation has been found between the two but the exchange rate does not help in determining stock returns; they might have an opposite relationship i.e. stock returns affecting forex returns but nothing can be said about that. In short term, they share a weak relationship.

It is mostly argued that as the interest rates keep on falling, there is an even more bright opportunity to invest in stocks as they have a negative correlation. But, this study has found no significant long term or short term relationship between the two. But they do have an inverse relationship.

From the correlation analysis, we can conclude that there is an opportunity for investors to diversify their portfolios by investing in all these markets (gold, oil, forex and debt) because these markets do not significantly impact each other.

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APPENDIX

Exhibit 1: Data for Short term Analysis

# of Obs	Time period	GOLD RETURNS	OIL RETURNS	FOREX RETURNS	INTEREST RATES	KSE- RETURNS
		X_1	X_2	X_3	X_4	Y
1	1/1/2008	10.76%	1.55%	100.00%	10.00%	-0.6911%
2	2/1/2008	3.68%	3.23%	-40.21%	10.31%	33.8003%
3	3/1/2008	5.20%	8.83%	-20.96%	10.49%	6.5235%
4	4/1/2008	-2.39%	11.27%	-126.75%	10.80%	-3.9513%
5	5/1/2008	3.92%	19.77%	-598.42%	11.30%	-102.9655%
6	6/1/2008	-0.55%	6.43%	51.24%	11.78%	10.0098%
7	7/1/2008	11.12%	6.00%	-472.21%	12.25%	-62.4071%
8	8/1/2008	-6.05%	-9.04%	-498.44%	12.70%	-65.8609%
9	9/1/2008	2.61%	-10.10%	-372.46%	13.15%	-1.4629%
10	10/1/2008	0.96%	-23.95%	-406.09%	13.60%	0.2098%
11	11/1/2008	-6.07%	-25.97%	63.70%	14.30%	0.2298%
12	12/1/2008	6.03%	-24.03%	126.73%	14.95%	-244.5850%
13	1/1/2009	5.45%	5.96%	-20.47%	14.50%	-40.0036%
14	2/1/2009	10.28%	-4.50%	-45.68%	14.00%	35.3613%
15	3/1/2009	-0.99%	13.57%	-98.09%	14.00%	93.2961%
16	4/1/2009	-3.52%	7.28%	-19.93%	14.00%	25.2481%
17	5/1/2009	4.49%	15.74%	-16.27%	14.00%	5.7396%
18	6/1/2009	2.40%	19.64%	-53.19%	13.35%	-6.3185%
19	7/1/2009	0.18%	-5.16%	-127.89%	13.00%	33.5243%
20	8/1/2009	2.42%	11.66%	-92.47%	13.00%	61.0624%
21	9/1/2009	5.03%	-4.49%	-9.00%	13.00%	37.9826%
22	10/1/2009	5.13%	8.80%	-44.63%	12.50%	-7.6617%
23	11/1/2009	8.37%	5.02%	-28.34%	12.50%	3.9575%
24	12/1/2009	1.37%	-2.80%	-65.25%	12.00%	9.8282%
25	1/1/2010	-0.88%	3.62%	-61.09%	12.00%	12.2506%
26	2/1/2010	-1.63%	-2.73%	-44.84%	12.00%	2.6481%
27	3/1/2010	1.01%	5.47%	65.10%	12.50%	24.2706%
28	4/1/2010	2.61%	5.52%	49.02%	12.50%	11.1973%
29	5/1/2010	5.43%	-9.80%	-46.63%	12.50%	-52.2121%
30	6/1/2010	3.48%	0.09%	-111.70%	12.50%	19.8113%
31	7/1/2010	-2.98%	-0.01%	-25.58%	12.50%	36.1514%
32	8/1/2010	2.01%	1.92%	-12.14%	12.93%	-30.6580%
33	9/1/2010	4.76%	0.52%	-18.05%	13.00%	10.3604%
34	10/1/2010	5.78%	7.56%	-20.93%	13.44%	27.2181%
35	11/1/2010	1.59%	2.95%	46.49%	12.80%	32.7567%
36	12/1/2010	1.72%	6.77%	-19.04%	12.00%	32.4908%
37	1/1/2011	-2.48%	2.85%	3.43%	13.80%	13.5874%
38	2/1/2011	0.76%	5.01%	42.63%	13.60%	-47.0101%
39	3/1/2011	3.75%	11.19%	-2.80%	13.80%	21.1871%
40	4/1/2011	3.04%	6.16%	83.92%	14.00%	10.0798%
41	5/1/2011	2.87%	-6.41%	-68.58%	14.00%	2.7848%
42	6/1/2011	1.80%	-1.44%	-66.87%	14.00%	14.0080%
43	7/1/2011	3.14%	2.21%	-27.26%	14.00%	-11.6002%
44	8/1/2011	12.54%	-6.24%	-69.34%	13.50%	-44.6644%
45	9/1/2011	1.75%	1.34%	-97.56%	13.50%	31.1241%
46	10/1/2011	-6.59%	-1.56%	58.52%	13.50%	5.3251%
47	11/1/2011	4.39%	5.45%	3.90%	12.00%	-14.8804%
48	12/1/2011	-2.86%	1.76%	-269.60%	12.00%	-7.6242%
49	1/1/2012	1.63%	3.54%	-88.26%	11.60%	21.2441%
50	2/1/2012	5.97%	5.96%	-53.29%	11.75%	38.8356%

51	3/1/2012	-3.86%	4.59%	-10.46%	11.75%	32.0280%
52	4/1/2012	-1.53%	-3.52%	8.72%	11.50%	8.1055%
53	5/1/2012	-2.98%	-7.90%	-68.59%	11.00%	-6.1180%
54	6/1/2012	3.80%	-10.01%	-303.31%	11.00%	0.8107%
55	7/1/2012	-0.36%	6.85%	-27.84%	10.50%	25.0694%
56	8/1/2012	2.62%	8.90%	-9.33%	10.50%	30.3589%
57	9/1/2012	7.15%	1.11%	-12.87%	10.00%	1.9393%
58	10/1/2012	0.92%	-1.96%	-79.81%	9.60%	14.2487%
59	11/1/2012	-0.76%	-1.48%	-67.08%	9.00%	19.5590%
60	12/1/2012	-0.91%	1.26%	-122.90%	9.00%	9.9616%
61	1/1/2013	-0.48%	4.12%	-29.24%	9.50%	10.1058%
62	2/1/2013	-2.17%	3.00%	-50.70%	9.50%	27.8052%
63	3/1/2013	-2.01%	-4.59%	-9.36%	9.50%	-3.0702%
64	4/1/2013	-6.37%	-3.42%	-25.57%	9.50%	23.2621%
65	5/1/2013	-4.90%	0.58%	-42.56%	9.50%	64.0132%
66	6/1/2013	-4.79%	0.62%	0.00%	9.50%	-18.4302%
67	7/1/2013	-2.34%	7.65%	-177.66%	9.00%	45.7291%
68	8/1/2013	7.65%	5.15%	-230.02%	9.00%	-27.4765%
69	9/1/2013	2.06%	2.98%	-219.34%	9.00%	-6.2114%
70	10/1/2013	-1.57%	-2.25%	-95.06%	9.50%	22.7407%
71	11/1/2013	-1.99%	-1.62%	-124.50%	10.00%	34.5411%
72	12/1/2013	-4.65%	2.41%	61.08%	10.00%	18.5721%
73	1/1/2014	0.34%	-4.52%	140.52%	10.00%	26.7960%
74	2/1/2014	4.12%	2.20%	26.21%	9.80%	-19.6884%
75	3/1/2014	-2.37%	-5.75%	501.82%	9.80%	25.1063%
76	4/1/2014	-4.95%	-1.35%	254.15%	9.80%	28.8810%
77	5/1/2014	0.32%	1.83%	-107.48%	9.70%	1.2728%
78	6/1/2014	-0.55%	2.30%	0.15%	9.80%	-0.2860%
79	7/1/2014	2.47%	-2.72%	-0.21%	9.60%	2.2310%
80	8/1/2014	0.00%	-3.37%	-1.68%	9.40%	-5.7610%
81	9/1/2014	-2.02%	-2.09%	-2.02%	9.00%	4.0558%
82	10/1/2014	-1.02%	-9.87%	-0.35%	9.00%	2.1871%
83	11/1/2014	-4.44%	-11.40%	0.98%	9.00%	2.7042%
84	12/1/2014	0.75%	-22.13%	0.99%	9.00%	2.9915%
85	1/1/2015	4.18%	-21.72%	0.07%	9.00%	7.1973%
86	2/1/2015	-1.22%	16.55%	-0.69%	8.00%	-2.3570%
87	3/1/2015	-3.40%	-3.50%	-0.32%	8.00%	-10.1040%
88	4/1/2015	1.71%	8.59%	0.10%	7.50%	11.5635%
89	5/1/2015	-0.07%	8.95%	-0.12%	7.50%	-1.9960%
90	6/1/2015	-1.42%	-1.96%	0.07%	6.50%	4.0599%
91	7/1/2015	-4.40%	-11.26%	2.78%	6.50%	3.9032%
92	8/1/2015	-0.43%	-15.45%	-2.98%	6.50%	-2.8400%
93	9/1/2015	2.39%	3.13%	-0.62%	6.50%	-7.0240%
94	10/1/2015	3.19%	1.69%	0.19%	6.00%	6.1144%
95	11/1/2015	-5.60%	-7.37%	0.17%	6.00%	-5.8560%
96	12/1/2015	-2.36%	-4.20%	1.20%	6.00%	1.5583%

Exhibit 2: Data for Long-term Analysis

# of Obs	Time period	GOLD RETURNS X_1	OIL RETURNS X_2	FOREX RETURNS X_3	INTEREST RATES X_4	KSE- RETURNS Y
1	2008	2.44%	-3.00%	-12.976%	12.14%	10.77%
2	2009	3.38%	5.89%	-14.695%	13.32%	-41.72%
3	2010	1.91%	1.82%	-4.014%	12.56%	35.74%
4	2011	1.84%	1.69%	-1.295%	13.48%	28.53%
5	2012	0.97%	0.61%	-8.069%	10.60%	10.45%
6	2013	-1.80%	1.22%	-7.566%	9.46%	52.20%
7	2014	-0.61%	-4.74%	0.599%	9.49%	41.16%
8	2015	-0.62%	-2.03%	-1.757%	7.00%	16.01%

Data Sources:

(Bullion-rates.com, 2016)

(Finance.yahoo.com, 2016)

(Financehub.pk, 2016)

("Historical Chart of gold prices in Pakistan", 2012)

(Indexmundi.com, 2016)

(OANDA, 2016)

(Psx.com.pk, 2016)

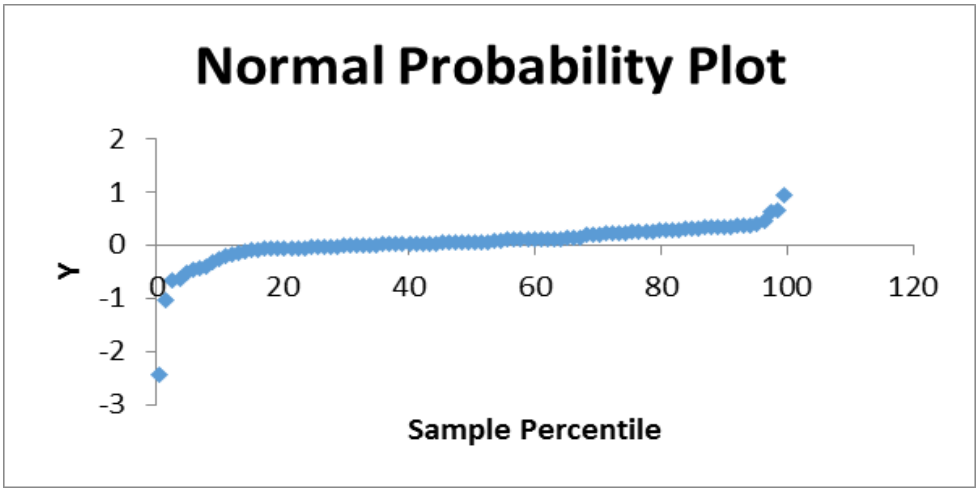
(Quandl.com, 2016)

(State Bank of Pakistan, 2016)

(Tradingeconomics.com, 2016)

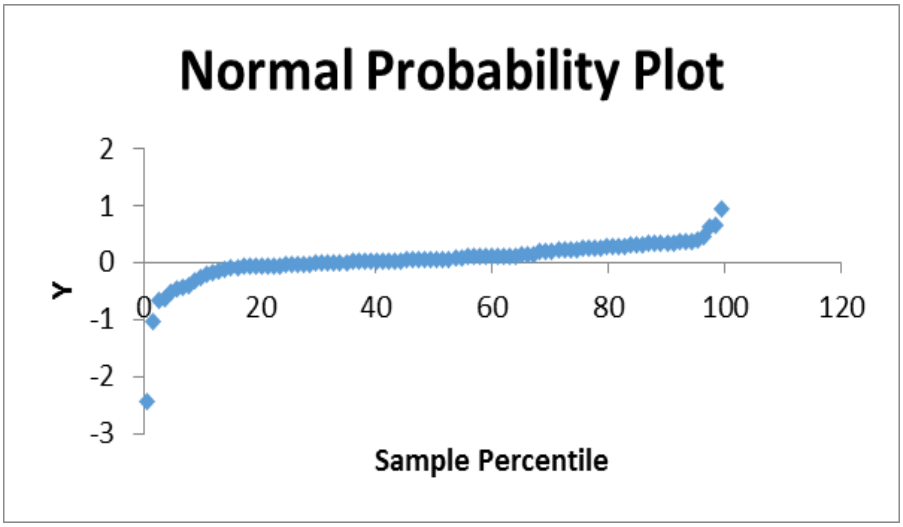
(Usforex.com, 2016)

Normal Probability Plot of Regression between Gold returns and Stock returns



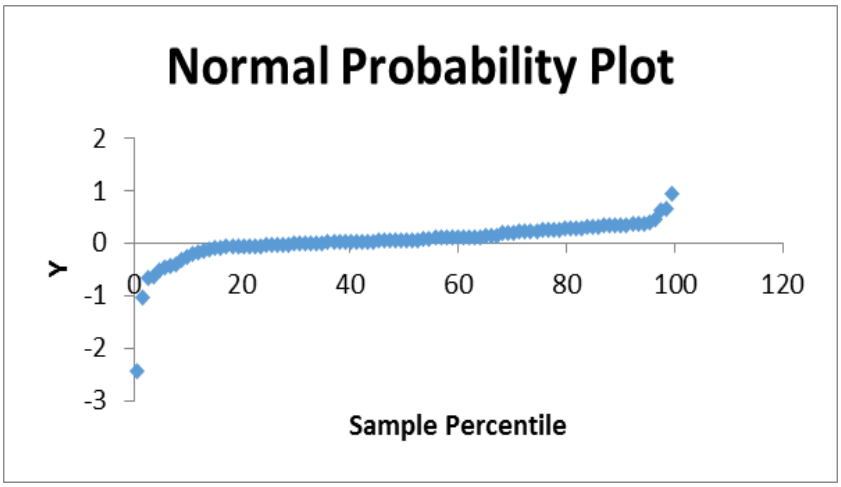
Obs.	*Predicted Y*	*Residuals*
1	-0.18285232	0.175940848
2	-0.02235403	0.360356942
3	-0.05681129	0.122046423
4	0.115248316	-0.15476097
5	-0.02779465	-1.00186045
6	0.073536896	0.026561118
7	-0.19101325	-0.43305732
8	0.198217772	-0.85682708
9	0.001902065	-0.01653093
10	0.039306328	-0.03720821
11	0.198671157	-0.19637363
12	-0.07562677	-2.37022359
13	-0.06247861	-0.3375577
14	-0.17197108	0.525583776
15	0.083511366	0.849449987
16	0.140864569	0.111616185
17	-0.04071613	0.098111989
18	0.006662608	-0.06984746
19	0.056988343	0.278254989
20	0.006209223	0.604414332
21	-0.05295752	0.432783887
22	-0.05522445	-0.02139257
23	-0.12867282	0.168247623
24	0.030011935	0.068270516
25	0.081017748	0.041488532
26	0.098019686	-0.07153875
27	0.038172865	0.204532745
28	0.001902065	0.110071077
29	-0.06202522	-0.46009604
30	-0.01782018	0.215933182
31	0.128623174	0.232890709
32	0.015503615	-0.32208319
33	-0.04683682	0.150440806
34	-0.06995946	0.342140259
35	0.0250247	0.302542337
36	0.022077698	0.30283005
37	0.117288549	0.018585818
38	0.043840178	-0.5139409
39	-0.02394088	0.235811639
40	-0.00784571	0.108643464
41	-0.00399194	0.031840225
42	0.020264158	0.119815916
43	-0.01011264	-0.10588918
44	-0.22320359	-0.22344012
45	0.02139762	0.289843879
46	0.210459167	-0.15720783
47	-0.0384492	-0.11035493
48	0.125902864	-0.20214512
49	0.02411793	0.188323531
50	-0.07426662	0.462622691
51	0.148572114	0.171708386
52	0.095752761	-0.01469745
53	0.128623174	-0.18980329
54	-0.02507434	0.033181335
55	0.069229738	0.181464393
56	0.001675373	0.30191353
57	-0.10101633	0.1204093
58	0.040213098	0.102274008
59	0.078297438	0.117292846
60	0.081697826	0.017918155
61	0.071950048	0.029107677
62	0.110261081	0.167791291
63	0.106634001	-0.13733609
64	0.205471932	0.027148707
65	0.172148134	0.467984107
66	0.169654516	-0.35395657
67	0.114114853	0.343176452
68	-0.11235096	-0.16241361
69	0.014370153	-0.07648397
70	0.096659531	0.13074767
71	0.106180616	0.239229993
72	0.166480821	0.019239768
73	0.053361263	0.21459866
74	-0.0323285	-0.16455525
75	0.114794931	0.136268446
76	0.173281596	0.115528887
77	0.053814648	-0.04108631
78	0.073526452	-0.07638645
79	0.004969703	0.017340297
80	0.061046238	-0.11865624
81	0.10677149	-0.06621349
82	0.084290985	-0.06241998
83	0.161656276	-0.13461428
84	0.044095013	-0.01418001
85	-0.03365853	0.105631525
86	0.088735489	-0.11230549
87	0.138248396	-0.2392884
88	0.022213296	0.093421704
89	0.062707781	-0.08266778
90	0.09328223	-0.05268323
91	0.1608284	-0.1217964
92	0.070815786	-0.09921579
93	0.006956183	-0.07719618
94	-0.0112069	0.072350895
95	0.187907975	-0.24646798
96	0.114546308	-0.09896331

Normal Probability Plot of Regression between Oil returns and Stock returns



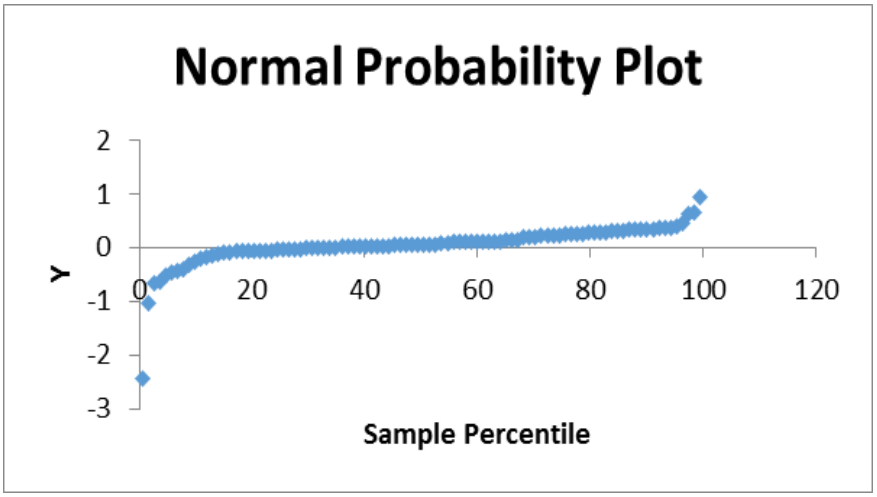
Obs	*Predicted Y*	*Residuals*
1	0.054201985	-0.06111346
2	0.071657522	0.266345388
3	0.129842647	-0.064607517
4	0.155194737	-0.194707391
5	0.243511444	-1.273166545
6	0.104906165	-0.004808151
7	0.100438378	-0.724508952
8	-0.05583024	-0.602779064
9	-0.06684386	0.052214991
10	-0.21074814	0.212846259
11	-0.23173634	0.234033866
12	-0.21157935	-2.234271007
13	0.10002277	-0.50005908
14	-0.00865873	0.362271423
15	0.179092199	0.753869154
16	0.113737835	0.138742918
17	0.201638935	-0.14424307
18	0.242160718	-0.305345574
19	-0.01551626	0.350759596
20	0.159246915	0.45137664
21	-0.00855483	0.388381196
22	0.129530941	-0.206147952
23	0.090255981	-0.050681174
24	0.009004611	0.089277841
25	0.0757097	0.04679658
26	0.009731925	0.016749011
27	0.094931572	0.147774038
28	0.095451082	0.01652206
29	-0.0637268	-0.458394463
30	0.039032291	0.159080708
31	0.037993271	0.323520612
32	0.058046359	-0.364625932
33	0.043500078	0.060103906
34	0.116647092	0.15553371
35	0.068748266	0.258818771
36	0.108438833	0.216468915
37	0.067709246	0.068165121
38	0.090152079	-0.5602528
39	0.154363521	0.057507239
40	0.10210081	-0.001303059
41	-0.02850401	0.056352299
42	0.023135284	0.11694479
43	0.061059517	-0.177061332
44	-0.02673768	-0.419906028
45	0.052020042	0.259221457
46	0.02188846	0.031362879
47	0.094723768	-0.243527898
48	0.056383927	-0.132626179
49	0.074878484	0.137562977
50	0.10002277	0.288333306
51	0.085788195	0.234492304
52	0.001523666	0.079531649
53	-0.04398541	-0.017194708
54	-0.06590874	0.07401573
55	0.109270049	0.141424082
56	0.130569961	0.173018942
57	0.049630296	-0.030237327
58	0.01773238	0.124754727
59	0.022719676	0.172870608
60	0.051188826	0.048427154
61	0.080904801	0.020152925
62	0.069267776	0.208784597
63	-0.00959385	-0.021108239
64	0.002562686	0.230057953
65	0.04412349	0.596008751
66	0.044539098	-0.228841152
67	0.11758221	0.339709096
68	0.091606708	-0.366371277
69	0.069059972	-0.131173792
70	0.014719221	0.212687979
71	0.021265048	0.324145561
72	0.063137557	0.122583032
73	-0.00886653	0.276826457
74	0.060955615	-0.257839369
75	-0.02164648	0.272709858
76	0.024070402	0.264740082
77	0.057111241	-0.044382904
78	0.061982692	-0.064842692
79	0.009884081	0.012425919
80	0.003096497	-0.060706497
81	0.016364681	0.024193319
82	-0.06443075	0.08630175
83	-0.08034643	0.107388426
84	-0.19184128	0.221756281
85	-0.18757799	0.259550989
86	0.210054997	-0.233624997
87	0.00173147	-0.10277147
88	0.127348999	-0.011713999
89	0.131089471	-0.151049471
90	0.01773238	0.02286662
91	-0.07889649	0.117928488
92	-0.12243143	0.09403143
93	0.070618502	-0.140858502
94	0.055656613	0.005487387
95	-0.03847861	-0.020081393
96	-0.00554167	0.02112467

Normal Probability Plot of Regression between Forex returns & Stock returns



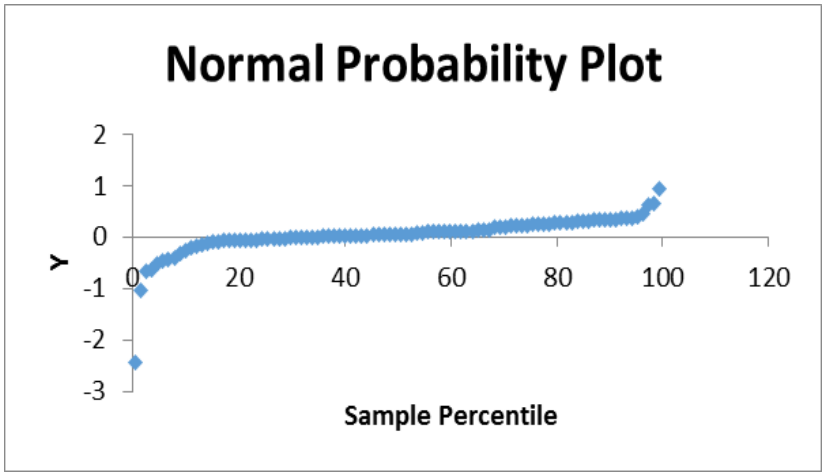
Obs	Predicted Y	Residuals
1	0.11536626	-0.122277733
2	0.04262981	0.295373098
3	0.05261607	0.012619056
4	-0.0022646	-0.037248066
5	-0.2469521	-0.782703049
6	0.0900729	0.010025115
7	-0.1814806	-0.442590023
8	-0.1950859	-0.463523396
9	-0.12973	0.115101103
10	-0.1471794	0.149277526
11	0.09653647	-0.094238949
12	0.12923144	-2.575081799
13	0.05287218	-0.452908487
14	0.03979272	0.313819975
15	0.01260402	0.920357334
16	0.05314982	0.199330937
17	0.05504841	0.002347458
18	0.03589499	-0.099079849
19	-0.0028575	0.338100835
20	0.01551745	0.595106105
21	0.05881804	0.321008331
22	0.04033818	-0.116955191
23	0.04878973	-0.009214917
24	0.02963939	0.068643057
25	0.03179948	0.090706795
26	0.04022789	-0.013746958
27	0.0972606	0.14544501
28	0.08891726	0.023055884
29	0.03930043	-0.561421684
30	0.00554465	0.192568354
31	0.05021956	0.31129432
32	0.05719195	-0.363771523
33	0.0541265	0.049477487
34	0.05263246	0.219548343
35	0.08760543	0.239961605
36	0.05361065	0.271297098
37	0.06526689	0.070607476
38	0.08560522	-0.555705939
39	0.0620346	0.149836155
40	0.10702561	-0.006227854
41	0.02791008	-6.17902E-05
42	0.02879847	0.111281608
43	0.04934559	-0.165347404
44	0.02751513	-0.474158838
45	0.01288017	0.298361328
46	0.09384921	-0.040597875
47	0.06551154	-0.214315673
48	-0.076371	0.000128785
49	0.0177048	0.194736665
50	0.03584416	0.352511917
51	0.05806033	0.262220173
52	0.06801244	0.013042879
53	0.02790416	-0.089084282
54	-0.0938585	0.101965529
55	0.04904418	0.201649952
56	0.05865015	0.244938749
57	0.05681258	-0.037419613
58	0.02208513	0.120401973
59	0.02869205	0.16689823
60	-0.0002672	0.099883208
61	0.04832281	0.052734911
62	0.0371874	0.240864968
63	0.05863135	-0.089333442
64	0.0502255	0.18239514
65	0.04140824	0.598724004
66	0.06348913	-0.247791187
67	-0.0286757	0.485967021
68	-0.0558363	-0.218928307
69	-0.0502956	-0.011818231
70	0.01417243	0.21323477
71	-0.0010991	0.346509681
72	0.09517386	0.090546731
73	0.13638778	0.131572145
74	0.07708864	-0.273972396
75	0.32381929	-0.072755911
76	0.195333	0.093477488
77	0.00772938	0.004998955
78	0.06356551	-0.066425513
79	0.06337775	-0.041067747
80	0.062619	-0.120229003
81	0.06244042	-0.02188242
82	0.06330551	-0.04143451
83	0.06399594	-0.036953937
84	0.06400433	-0.034089334
85	0.06352667	0.00844633
86	0.0631312	-0.0867012
87	0.06332196	-0.164361957
88	0.06353938	0.052095623
89	0.06342793	-0.083387934
90	0.06352376	-0.022924761
91	0.06493384	-0.025901836
92	0.06194278	-0.090342781
93	0.06316601	-0.133406015
94	0.06358593	-0.002441925
95	0.06357732	-0.122137324
96	0.06411166	-0.048528658

Normal Probability Plot of Regression between Interest rates & Stock returns



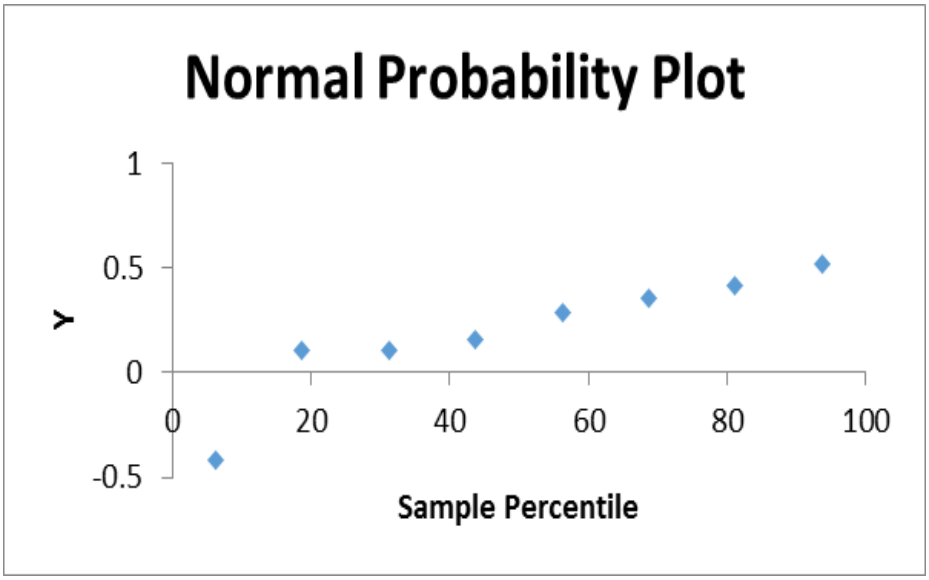
RESIDUAL OUTPUT		
Obs	*Predicted Y*	*Residuals*
1	0.056755697	-0.063667172
2	0.051446928	0.286555982
3	0.048429045	0.016806085
4	0.043314706	-0.08282736
5	0.034776719	-1.06443182
6	0.026745939	0.073352075
7	0.018715158	-0.642785733
8	0.011107051	-0.669716357
9	0.003498943	-0.018127807
10	-0.00410916	0.006207286
11	-0.015944	0.018241522
12	-0.02693349	-2.418916873
13	-0.01932538	-0.38071093
14	-0.01087193	0.36448462
15	-0.01087193	0.94383328
16	-0.01087193	0.26335268
17	-0.01087193	0.068267791
18	0.000117562	-0.063302418
19	0.006034979	0.329208353
20	0.006034979	0.604588576
21	0.006034979	0.373791388
22	0.014488432	-0.091105443
23	0.014488432	0.025086376
24	0.022941885	0.075340567
25	0.022941885	0.099564395
26	0.022941885	0.003539051
27	0.014488432	0.228217178
28	0.014488432	0.09748471
29	0.014488432	-0.53660969
30	0.014488432	0.183624568
31	0.014488432	0.347025451
32	0.007302997	-0.31388257
33	0.006034979	0.097569004
34	-0.00140406	0.273584861
35	0.00941636	0.318150677
36	0.022941885	0.301965863
37	-0.00749055	0.143364912
38	-0.00410916	-0.465991556
39	-0.00749055	0.219361305
40	-0.01087193	0.111669678
41	-0.01087193	0.038720212
42	-0.01087193	0.150952
43	-0.01087193	-0.105129888
44	-0.00241847	-0.444225234
45	-0.00241847	0.313659974
46	-0.00241847	0.055669812
47	0.022941885	-0.171746015
48	0.022941885	-0.099184138
49	0.029704647	0.182736814
50	0.027168611	0.361187465
51	0.027168611	0.293111888
52	0.031395338	0.049659978
53	0.039848791	-0.101028912
54	0.039848791	-0.031741799
55	0.048302244	0.202391887
56	0.048302244	0.255286659
57	0.056755697	-0.037362727
58	0.063518459	0.078968648
59	0.073662602	0.121927682
60	0.073662602	0.025953378
61	0.06520915	0.035848576
62	0.06520915	0.212843223
63	0.06520915	-0.095911237
64	0.06520915	0.167411489
65	0.06520915	0.574923091
66	0.06520915	-0.249511204
67	0.073662602	0.383628703
68	0.073662602	-0.348427172
69	0.073662602	-0.135776423
70	0.06520915	0.162198051
71	0.056755697	0.288654912
72	0.056755697	0.128964893
73	0.056755697	0.211204226
74	0.060137078	-0.257020832
75	0.060137078	0.190926299
76	0.060137078	0.228673406
77	0.061827768	-0.049099432
78	0.060137078	-0.062997078
79	0.063518459	-0.041208459
80	0.06689984	-0.12450984
81	0.073662602	-0.033104602
82	0.073662602	-0.051791602
83	0.073662602	-0.046620602
84	0.073662602	-0.043747602
85	0.073662602	-0.001689602
86	0.090569508	-0.114139508
87	0.090569508	-0.191609508
88	0.099022961	0.016612039
89	0.099022961	-0.118982961
90	0.115929867	-0.075330867
91	0.115929867	-0.076897867
92	0.115929867	-0.144329867
93	0.115929867	-0.186169867
94	0.12438332	-0.06323932
95	0.12438332	-0.18294332
96	0.12438332	-0.10880032

Normal Probability Plot of Combined Regression in Short term



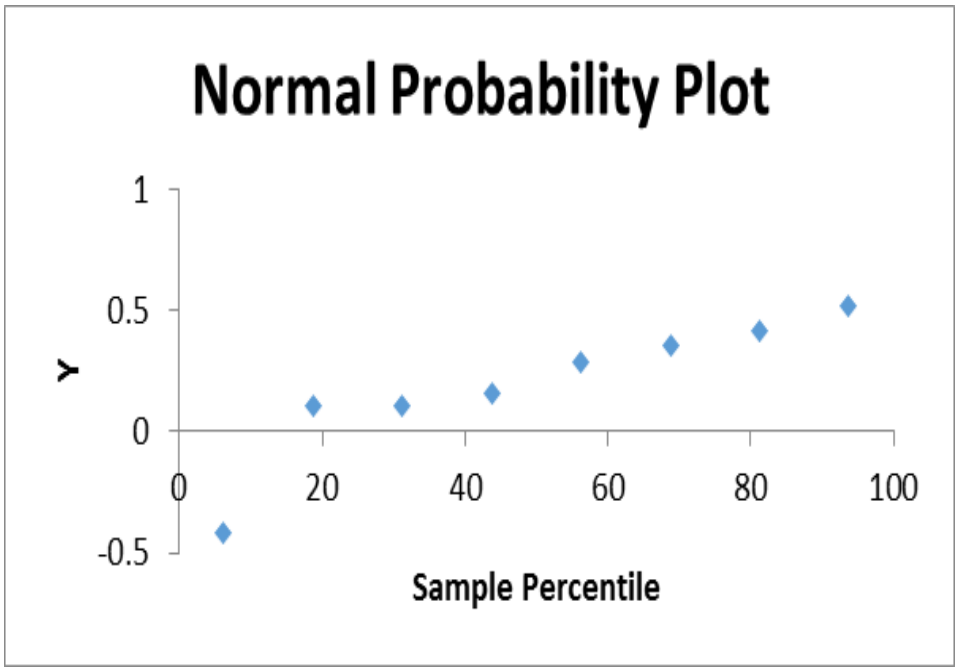
RESIDUAL OUTPUT		
Obs	*Predicted Y*	*Residuals*
1	-0.10747227	0.100560799
2	0.01918061	0.318822302
3	0.06259029	0.002644839
4	0.22716502	-0.266677676
5	-0.03414605	-0.995509053
6	0.19704207	-0.09694406
7	-0.3322188	-0.291851778
8	-0.12604143	-0.532567875
9	-0.29316731	0.278538451
10	-0.44947969	0.451577809
11	-0.09419582	0.096493345
12	-0.33550156	-2.110348798
13	-0.00026363	-0.399772676
14	-0.26061302	0.614225711
15	0.22010456	0.712856796
16	0.23589971	0.016581046
17	0.15333777	-0.095941906
18	0.24035318	-0.30353804
19	-0.05810386	0.393347197
20	0.12080665	0.489816906
21	-0.11201689	0.491843262
22	0.04299732	-0.119614329
23	-0.07641153	0.115986339
24	-0.02270032	0.120982775
25	0.11621129	0.006294992
26	0.05992847	-0.03344753
27	0.14975312	0.092952492
28	0.10442888	0.007544264
29	-0.20481766	-0.3173036
30	-0.06014846	0.258261455
31	0.13386442	0.22764946
32	0.04237471	-0.348954288
33	-0.04509206	0.148696041
34	0.01748751	0.254693287
35	0.09326173	0.234305303
36	0.11333308	0.211574668
37	0.16543022	-0.029555851
38	0.13405648	-0.604157205
39	0.11973469	0.092136065
40	0.11078026	-0.009982507
41	-0.11694615	0.144794433
42	-0.0263089	0.166388969
43	0.00653735	-0.12253917
44	-0.34589451	-0.100749197
45	-0.00083516	0.312076657
46	0.23450545	-0.181254108
47	0.04241884	-0.19122297
48	0.04449326	-0.120735511
49	0.04418212	0.168259336
50	-0.01407414	0.402430215
51	0.22504555	0.095234949
52	0.07437594	0.006679376
53	0.02000778	-0.081187903
54	-0.27827385	0.286380839
55	0.16802425	0.082669876
56	0.13102699	0.172561909
57	-0.07775459	0.097147556
58	0.00432746	0.13815965
59	0.05988211	0.135708173
60	0.0732332	0.026382783
61	0.14011408	-0.03905635
62	0.15662186	0.121430511
63	0.07390084	-0.10460293
64	0.1867408	0.045879837
65	0.19503012	0.445102123
66	0.21239035	-0.396692404
67	0.16498159	0.292309719
68	-0.13222928	-0.142535289
69	-0.02043524	-0.041678575
70	0.05417683	0.173230374
71	0.05643763	0.288972983
72	0.25755237	-0.071831778
73	0.08426706	0.183692859
74	0.02829687	-0.225180625
75	0.30031259	-0.049249211
76	0.30579002	-0.016979532
77	0.05445922	-0.041730881
78	0.13028404	-0.133144044
79	-0.00644911	0.028759111
80	0.04514401	-0.102754011
81	0.11210612	-0.071548119
82	-0.01124988	0.033120879
83	0.0519579	-0.024915901
84	-0.21141409	0.241329087
85	-0.28929742	0.361270416
86	0.33872664	-0.362296637
87	0.13324457	-0.234284571
88	0.16823079	-0.05259579
89	0.21586686	-0.235826856
90	0.11292254	-0.072323545
91	0.06622264	-0.027190639
92	-0.08620184	0.057801844
93	0.08631957	-0.156559572
94	0.05131	0.009834004
95	0.14647048	-0.205030483
96	0.1097133	-0.094130296

Normal Probability Plot of Regression between Gold returns and Stock returns



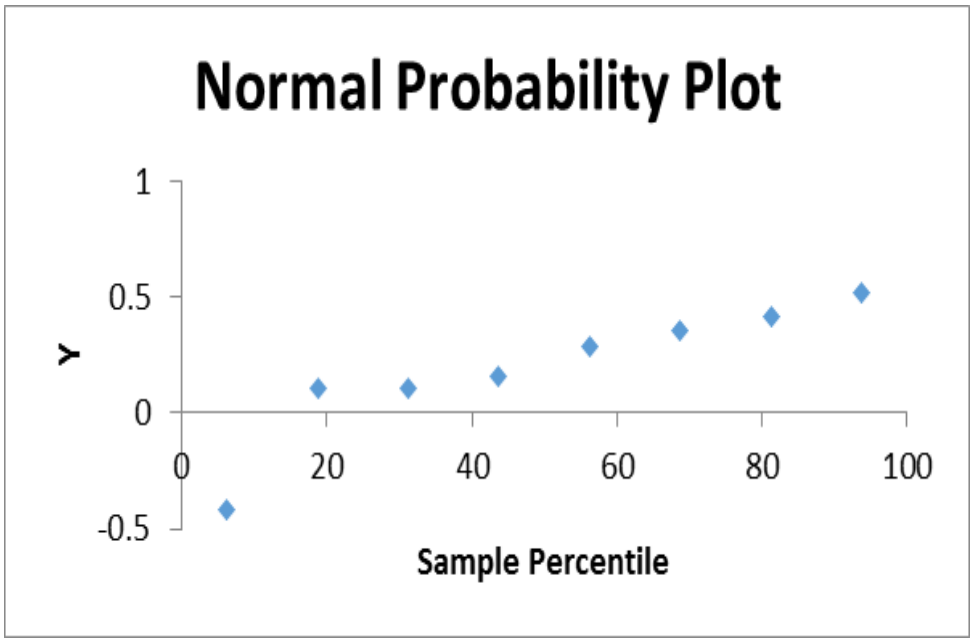
RESIDUAL OUTPUT		
Observation	*Predicted Y*	*Residuals*
1	0.019163442	0.088536558
2	-0.09016787	-0.327032126
3	0.079828403	0.277571597
4	0.087411524	0.197888476
5	0.187431919	-0.082931919
6	0.50659489	0.01540511
7	0.370125021	0.041474979
8	0.371012675	-0.210912675

Normal Probability Plot of Regression between Oil returns and Stock returns



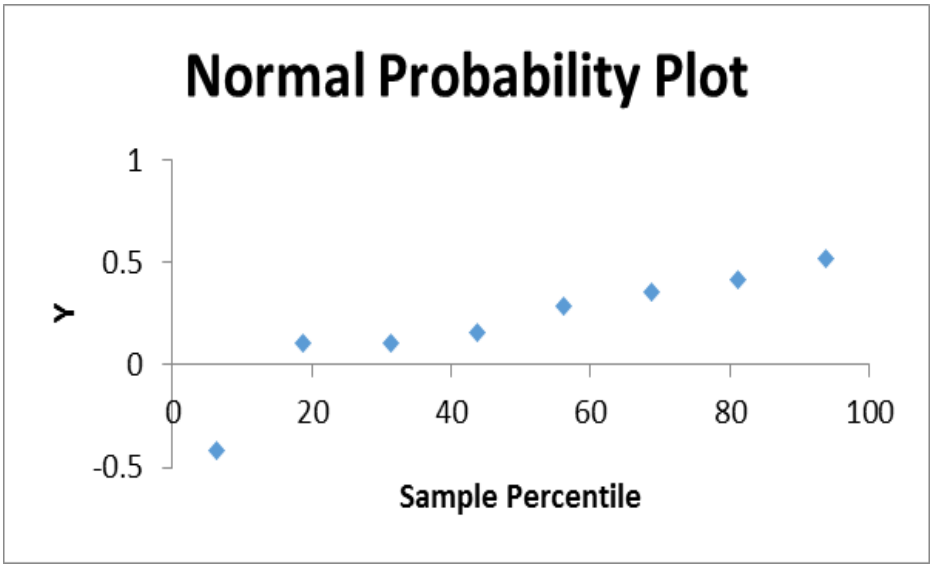
RESIDUAL OUTPUT		
Observation	*Predicted Y*	*Residuals*
1	0.334289042	-0.226589042
2	-0.064721513	-0.352478487
3	0.117867033	0.239532967
4	0.123699099	0.161600901
5	0.172224884	-0.067724884
6	0.144971188	0.377028812
7	0.412253233	-0.000653233
8	0.290817035	-0.130717035

Normal Probability Plot of Regression between Forex returns and Stock returns



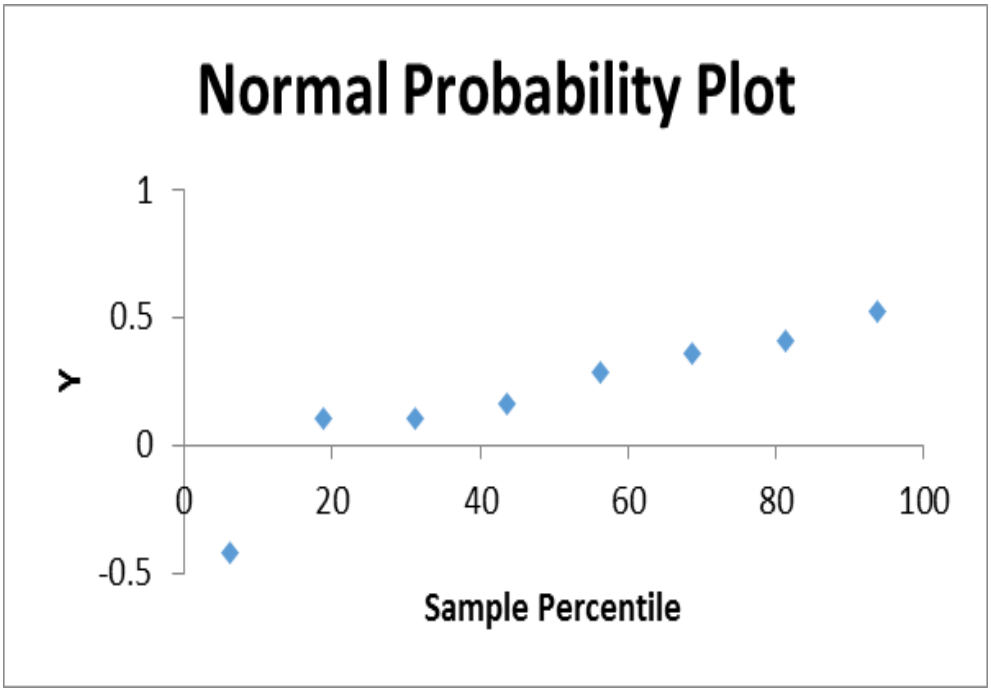
RESIDUAL OUTPUT		
Observation	*Predicted Y*	*Residuals*
1	-0.04470954	0.152409541
2	-0.10479369	-0.312406314
3	0.268583895	0.088816105
4	0.363657451	-0.078357451
5	0.126854639	-0.022354639
6	0.144429571	0.377570429
7	0.429863439	-0.018263439
8	0.347514234	-0.187414234

Normal Probability Plot of Regression between Interest rates and Stock returns

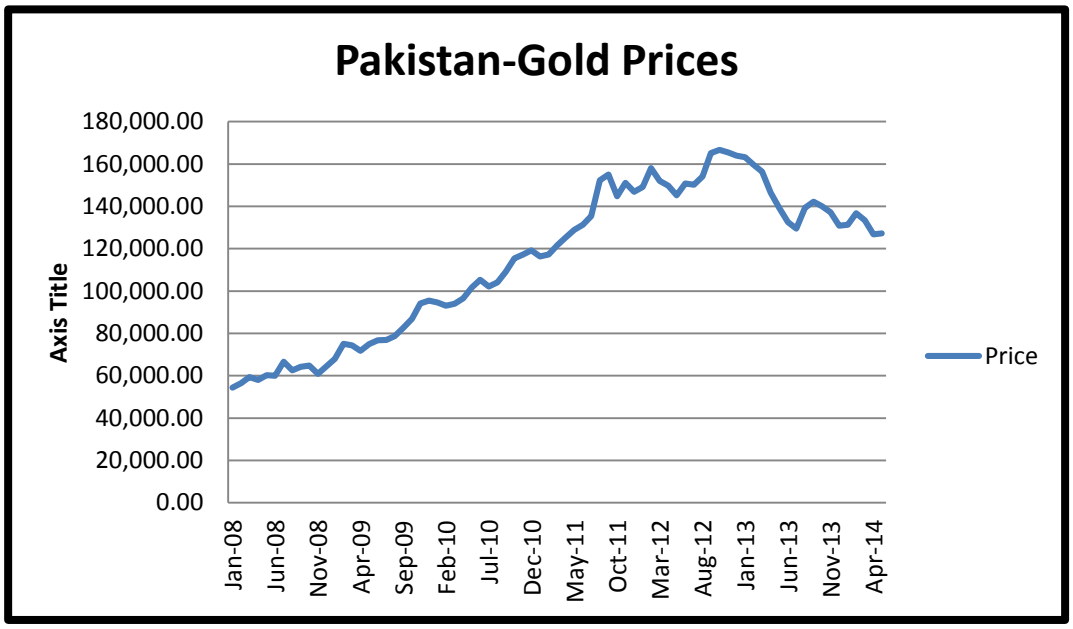


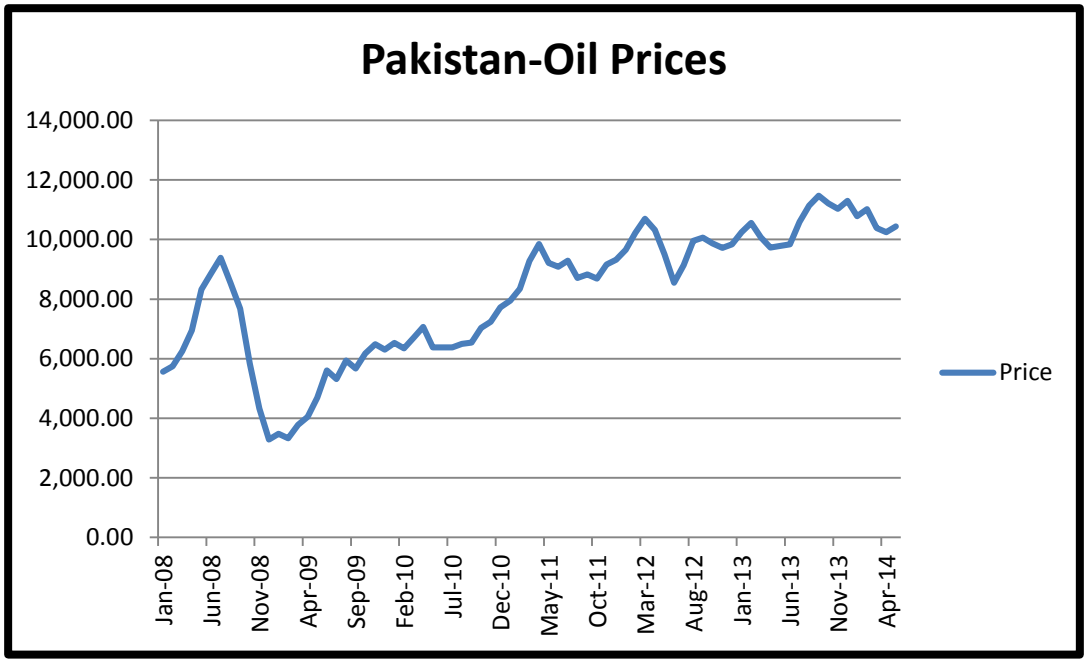
RESIDUAL OUTPUT		
Observation	*Predicted Y*	*Residuals*
1	0.138106384	-0.030406384
2	0.082225471	-0.499425471
3	0.118311258	0.239088742
4	0.07495724	0.21034276
5	0.210499933	-0.105999933
6	0.264324133	0.257675867
7	0.262752624	0.148847376
8	0.380222958	-0.220122958

Normal Probability Plot of Combined Regression in Long term



RESIDUAL OUTPUT		
Observation	*Predicted Y*	*Residuals*
1	0.051232292	0.056467708
2	-0.29028256	-0.126917438
3	0.167688742	0.189711258
4	0.331353457	-0.046053457
5	0.098458745	0.006041255
6	0.488795998	0.033204002
7	0.550812949	-0.139212949
8	0.133340379	0.026759621


Pakistan-Gold Prices
Axis Title
180,000.00
160,000.00
140,000.00
120,000.00
100,000.00
80,000.00
60,000.00
40,000.00
20,000.00
0.00
Jan-08
Jun-08
Nov-08
Apr-09
Sep-09
Feb-10
Jul-10
Dec-10
May-11
Oct-11
Mar-12
Aug-12
Jan-13
Jun-13
Nov-13
Apr-14
Price


Pakistan-Oil Prices
14,000.00
12,000.00
10,000.00
8,000.00
6,000.00
4,000.00
2,000.00
0.00
Jan-08
Jun-08
Nov-08
Apr-09
Sep-09
Feb-10
Jul-10
Dec-10
May-11
Oct-11
Mar-12
Aug-12
Jan-13
Jun-13
Nov-13
Apr-14
Price

PAKISTAN RUPEE

SOURCE: WWW.TRADINGECONOMICS.COM | OTC INTERBANK

PAKISTAN INTEREST RATE

SOURCE: WWW.TRADINGECONOMICS.COM | STATE BANK OF PAKISTAN

PAKISTAN STOCK MARKET (KSE100)