

## Oil Price Fluctuation and Stock Market Performance-The Case of Pakistan

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### Abstract

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*The level of development in any country is very much dependent upon the rate of investment in the economy. Stock market provides an effective platform for the diversion of funds from surplus to deficient units and their ultimate productive investment. The prevalence of optimistic and pessimistic approach in the stock market determines the rise and fall in the stock index. There are number of local and global macroeconomic variables that determine the stock market performance. In this study the objective of the researcher is to investigate the impact of international oil price fluctuation on the performance of stock markets in Pakistan and KSE-100 Index is taken as sample for analysis. In addition to oil price, other macroeconomic variables i.e. exchange rate and foreign private portfolio investment were also included in the model to strengthen its explanatory power. The study also analyzed the significance of political stability in the determination of stock market performance. The results revealed that the oil prices, exchange rate and foreign private portfolio investment have positive correlation with stock market performance while democratic set up is found to have a negative impact over stock market performance in Pakistan.*

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**Keywords:** KSE-100 Index, Oil Price, Exchange Rate, Foreign Private Portfolio Investment

### ***I. Introduction***

The level of development in an economy is very much dependent upon the rate of investment in the country. Stock markets provide a platform which diverts the funds from surplus to deficient units and results into their productive investment. The stock market movement is the result of fluctuation in demand and supply of the underlying assets, representing the equity holding of the company by the investors. Stock price represents the present value of the future cash flow streams of the company. In this regard the prevalence of optimism in the market would cause the rise in stock prices, while on the other hand the pessimistic considerations would lead to decline in the stock index. Hence, the mentioned is the cause that the stock market can be considered as the index of the economy.

The fluctuation in the stock prices is caused by the company's internal factors and the external widespread macroeconomic determinants. The company's earning pattern, profit margin, cash flow streams, new inventions, market share holding and the company's expansion with respect to the geographic and product portfolio diversification along with management reputation, are the major internal factors influencing the company's stock price. But the external macroeconomic determinants are proved to have a very strong bearing on the asset prices in the stock market and such determinants actually also indirectly affects the internal factors of the companies.

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Hence, the macroeconomic variables are very important to be considered in order to determine the expected fluctuation not only in the stock market index as a whole but also the price of an individual stock. The fluctuation in the macroeconomic variables represents the systematic or non-diversifiable risk. It is significant to observe that not only the country related factors like GDP, inflation, interest rate, money supply, exchange rate, industrial productivity affect the stock market index but the global factors also greatly influence the market performance. Such global determinants may include change in global interest rate, trade liberalization, fluctuation in USD value, gold prices and so forth. Oil price volatility has captured the interest of the researchers as an important determinant affecting the macroeconomic activities and ultimately the stock market indices in different patterns in different parts of the world especially since the experience of first oil crisis in 1973. According to Hamilton (1983), seven of the eight postwar recessions in the United States have been preceded by a dramatic increase in the price of crude. The mainstream empirical estimates suggested the doubling of oil price increases between 2003 and 2005 cumulatively lowered the global output at least by 1.5 % or about a 750 billion dollars till 2005 (Ragoff, 2006). Such conclusions and estimations have provided the base for the researchers to consider oil as an important determinant while evaluating the economic activities in any country.

Oil is an important component of production cost. In the absence of possibility of complete shift of the burden of oil price rise on to the consumers, the profits and dividends of companies are reduced which may result into decline in stock prices. The affect of oil price volatility would definitely be different in case of oil importing and exporting countries. The increase in oil prices increases the value of currency of the oil exporting countries and causes the value of currency in oil importing countries to weaken. Hence, the most profitable trade would be between the oil exporting country and the country with great dependence on oil import.

Developed economies are more energy efficient today than they were 20 years ago with oil consumption per dollar of GDP less than half of what it was in the 1970s (Basher and Sadorsky, 2006). Such efficiency is the result of using technologically advanced equipments and diversion towards other renewable energy resources. But the developing economies in this scenario are the major consumers of oil like India and China. This is so because their rapid growth is causing the demand for oil to rise.

In this regard the objective of this the paper is to uncover the impact of oil price movement on the stock market performance in Pakistan and Karachi Stock Exchange has been considered for analysis as true representative sample of the country's stock markets. In order to enhance the explanatory power of the model the researcher would also add the other macroeconomic variables which may have significant impact on the stock market movement.

The paper is organized into six sections. The next section would cover the review of theoretical literature. The third section would explain the empirical studies that provide linkage between oil price and the stock market performance, followed by the section covering the modeling framework and estimation of the results. The fifth section would conclude the results with policy implications followed by the section that would provide the direction for the future research.

## ***II. Review of Theoretical Literature***

Financial literature is quite rich with respect to theories covering different areas of the discipline including number of theories regarding valuation of the assets for example the stock of a company. Efficient Market Hypothesis (EMH) is considered to be a significant contribution in the literature by Prof. Eugene Fama in early 1960s. The hypothesis claims that the financial markets are as efficient with respect to information that no investor would be able to earn excess return over the average risk adjusted market return. There are three versions of the EMH regarding the informational efficiency of the market i.e. weak, semi-strong and strong form of EMH.

According to weak form EMH the price of assets, for example the stock price, reflect all past publicly available information whereas the semi-strong form EMH claims that the asset prices do not only reflect the publicly available information but are also instantly adjusted to the new information made available. According to strong form hypothesis the market is so efficient that the asset price does not reflect only the past publicly available information and quickly adjust to the new information but also incorporate the hidden information. If such form of hypothesis would practically exist no investor would be able to earn excess return over the average risk adjusted market return.

Harry Markowitz has a great contribution in literature of finance because of his work on diversification and modern portfolio theory. Capital asset pricing model (CAPM), an important asset valuation tool, was developed by Jack Treynor (1961, 1962), William Sharpe (1994), John Lintner (1965) and Jan Mossin (1966) independently on the work of Harry Markowitz. Such model determines the required rate of return on the asset. The model considers the sensitivity of the asset to systematic or non diversifiable risk, as well as the return on market portfolio and risk free return.

Stephen Ross made a great contribution in the field of finance by presenting Arbitrage Pricing Theory in 1976. This is the theory of asset pricing that describes how can the expected return and the asset value be calculated? According to the theory the expected return on any financial asset can be expressed as the linear function of various macroeconomic variables or theoretical market indices. The beta coefficient of each factor demonstrates the sensitivity in the expected return to a change in the factor. The asset value can be estimated by summing up all the future cash flows discounted at APT. Both the mentioned models have great importance in financial evaluations. The capital asset pricing model is considered as the demand side model while the arbitrage pricing model is said to be the supply side model.

### ***III. Review of Empirical Studies***

The financial literature is quite rich with respect to empirical studies that link the fluctuation in macroeconomic variables and the stock market performance. In Pakistan too, considerable number of studies have been conducted but with respect to impact of oil price fluctuations on stock market returns still there is a literature gap. Now we briefly review the empirical studies conducted in the mentioned area in different parts of the world:

Cobo-Reyes and Quirós (2005) examined the relationship between oil price shocks and industrial production and also between the oil price shocks and stock returns. The results of the study revealed that the raises in oil price negatively affects the stock returns and industrial production and such affects are also statistically significant but affect is stronger on stock returns than on industrial production.

Basher and Sadorsky (2006) found strong evidence that oil price risk impacts stock price returns in emerging markets although the exact relationship somewhat is dependent upon the data frequency being used. The conditional relationship is not, however, symmetrical. The study revealed that oil price increases have a positive impact on excess stock market returns for daily and monthly data, in emerging markets, whereas for weekly and monthly data, oil price decreases have positive and significant impacts on emerging market returns.

Liao and Chen (2008) evaluated the impact of oil and gold prices on individual industries rather than the whole market and found that both the electronic and rubber industrial sub-indices are influenced by the fluctuation in oil prices and the correlations among oil prices, electronic industrial sub- indices and rubber industrial sub-indices are concluded to be positive. According to Aloui, Jammazy and Dhakhlaoui (2008) in general, oil price volatility has a negative impact on stock market behavior.

Chen (2010) conducted a study to investigate whether the stock market is pushed by high oil price into bear territory considering the monthly returns on S&P 500 Price Index. The findings of the study suggest that there is high probability of a bear market emergence as a result of increase in oil prices.

Ramos and Veiga (2010) examined the asymmetric effects of oil price fluctuations in international stock markets and found that oil price spikes depress international stock markets but the drops in oil price do not necessarily increase stock market returns. The study further revealed that the volatility of oil price has a negative impact on international stock market returns. Both of these effects apply only to stock markets of developed countries and emerging market returns are not proved to be sensitive to oil price variations.

Ono (2011) examined the impact of oil prices on real stock returns for BRIC (Brazil, Russia, India, China). The study suggested that whereas real stock returns positively respond to some of the oil price indicators with statistical significance for China, India and Russia, those of Brazil do not show any significant responses. It also revealed statistically significant asymmetric effects of oil price increases and decreases in India. It further showed that the contribution of oil price shocks to volatility in real stock returns is relatively large and statistically significant for China and Russia.

Basher, Haug and Sadorsky (2012) concluded that positive shocks to oil prices tend to depress the emerging markets' stock prices and US dollar exchange rates in the short run. Adaramola (2012) examined the long-run and short-run dynamic effects of oil price on stock returns in Nigeria and found a significant positive stock return to oil price shock in the short-run and a significant negative stock return to oil price shock in the long-run.

Ansar and Asghar (2013) analyzed the impact of oil prices on the consumer price index and stock market (KSE-100 Index). The study revealed that there is a positive relationship among oil prices, CPI and KSE-100 Index but such relationship is not much stronger.

Abdalla (2013) examined the impact of oil price fluctuations on stock market returns in the Kingdom of Saudi Arabia. The empirical evidence from daily returns on the Saudi Stock market (Tadawul) Index and daily crude oil prices suggests that stock market returns volatility increased as a result of crude oil price fluctuations during the period of study.

#### ***IV. Model Estimations and Results***

Stock market is influenced by number of local and global economic factors. The economies of different countries are getting more integrated and there are certain factors which affect the economy of every country with different patterns and intensities. In this study the researcher has focused on the global factor i.e. the crude oil price fluctuation in international markets, which is affecting the economic activities, one way or the other, in every country in the world. In this manner oil price fluctuation is the main variable to be evaluated in this study with respect to its impact on stock market performance in Pakistan but in order to enhance the explanatory power of the model, the other macroeconomic variables i.e. exchange rate and foreign private portfolio investment have also been considered. In addition to that the model also includes a dummy variable representing the level of political stability in the country. Hence our proposed model is:

$$KSE = \beta_1 + \beta_2 (OP) + \beta_3 (ER) + \beta_4 (FPPI) + \beta_5 (PS) + \varepsilon$$

Where KSE represent KSE-100 Index, OP expresses the Crude Oil Prices per barrel in US dollar (West Texas Intermediate-Cushing), ER is the exchange rate (Pak rupee per US dollar), FPPI represents Foreign Private Portfolio Investment (in million US dollars).

PS is political stability, a dummy variable where if PS=1, it represents democratic government and if PS=0, it shows the dictatorial period. The annual time series data has been taken from 2003 to 2012 for analysis. The data of KSE-100 Index has been extracted from the website of Karachi Stock Exchange (where as the oil prices data has been taken from Wall Street Journal Exchange rate and foreign private portfolio investment data was drawn from the statistical publications of State Bank of Pakistan.

Table I shows the descriptive statistics of all the variables including KSE-100 Index, the dependent variable and oil price, exchange rate, foreign private portfolio investment and political stability, the independent variables

**Table I: Descriptive Statistics of All Variables**

	<b>KSE</b>	<b>OP</b>	<b>ER</b>	<b>FPPI</b>	<b>PS</b>
<b>Mean</b>	9536.42	73.43	71.14	272.04	0.50
<b>Median</b>	9855.66	72.34	64.30	87.35	0.50
<b>Maximum</b>	13801.41	140	94.42	1820.40	1.00
<b>Minimum</b>	3402.48	30.18	57.81	-510.30	0.00
<b>Std. Dev.</b>	3627.81	30.83	14.09	620.47	0.53
<b>Skewness</b>	-0.3188	0.6924	0.4664	1.5538	0.00
<b>Kurtosis</b>	1.8403	3.4472	1.5604	5.1318	1.00
<b>Jarque-Bera</b>	0.7298	0.8823	1.2260	5.9175	1.6667
<b>Probability</b>	0.6943	0.6433	0.5417	0.0519	0.4346
<b>Observation</b>	10	10	10	10	10

**Table II: Correlation Matrix**

	<b>KSE</b>	<b>OP</b>	<b>ER</b>	<b>FPPI</b>	<b>PS</b>
<b>KSE</b>	1.00	0.75	0.49	0.48	0.45
<b>OP</b>	0.75	1.00	0.42	0.03	0.68
<b>ER</b>	0.49	0.42	1.00	-0.23	0.89
<b>FPPI</b>	0.48	0.03	-0.23	1.00	-0.33
<b>PS</b>	0.45	0.68	0.89	-0.33	1.00

The above table shows the correlation between the variables. It can be observed that oil price has moderate positive correlation with KSE-100 Index, representing that an increase in oil price has had a positive impact on Karachi stock exchange. It is important to notice that the other variables also have positive correlation with KSE-100 Index but relationship is low at the scale.

**Table III: Determinants of KSE-100 Index**

<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
<b>C</b>	-17655.33	3594.79	-4.91	0.00
<b>OP</b>	122.87	15.68	7.84	0.00
<b>ER</b>	306.09	52.36	5.85	0.00
<b>FPPI</b>	1.95	0.52	3.72	0.01
<b>PS</b>	-8268.53	1872.61	-4.42	0.00
<b>Adj.R<sup>2</sup></b>	0.95	<b>F-statistic</b>		46.75
<b>DW Statistic</b>	2.49	<b>Prob. (F-statistic)</b>		0.00

The regression results indicate that the independent variables in the model explain approximately 95 percent variation in the dependent variable. The Durbin Watson Statistic is 2.49 which is indicating the absence of autocorrelation. The probability of F-Statistic shows that the model is overall significant at 5 percent level of significance.

The focused variable i.e. oil price has a positive sign which means that an increase in oil price would cause the stock market index to go up and vice versa and the results are also statistically significant. Such results reflect that the returns on Karachi Stock Exchange increases as the oil prices increase which is in line with study conducted by Asnsar and Asghar (2013). Exchange rate has also a positive sign and is statistically significant too which indicates that the devaluation of Pak rupee against dollar is causing the stock market index to rise. The reason behind such phenomenon may be that the exports of the companies would increase as the result of devaluation of the currency, resulting into their profits to rise. Hence, the stock prices and ultimately the stock index would go up.

Foreign private portfolio investment represents the investment in securities, which directly affects the stock market index. It is expected that an increase in foreign portfolio investment would have a positive impact on the market performance and returns. The regression results are in the line of the expectations as foreign private portfolio investment has a positive sign and such results are also statistically significant.

In this study the researcher also included a dummy variable i.e. political stability, a qualitative factor. The results show that the political stability has a negative sign which means that the stock market tends to go up during dictatorial tenures and it is negatively effected during democratic government control.

### ***V. Conclusion and Policy Implications***

Since the experience of oil crisis in 1973, the oil price fluctuations have captured the great interest of the researchers around the world to investigate its impacts on different economic activities. Stock markets have also been observed to reflect the oil price fluctuation in different manner in different parts of the world. In this regard this study is an effort to find how the stock markets in Pakistan are affected by oil price fluctuation. The study revealed that oil price rise does not dampen the stock returns rather it has a positive relationship with stock market index. Along with oil price the study also explains that the exchange rate and foreign private portfolio investment also has a positive and statistically significant relationship with stock market performance in Pakistan. It further shows that democratic tenures negatively but dictatorial periods positively influence the stock market performance. Hence the study guides the investors and the policy makers to estimate the expected inflow of foreign private portfolio investment, probable changes in oil price and exchange rate in order to forecast the movement in stock markets in Pakistan.

### ***VI. Direction for Further Research***

In this study the researcher has made effort to examine the influence of oil price movement on stock market performance along with other key macroeconomic variables on the basis of period ended, ten years data. Oil price is the factor which may generate rapid responses from the investors causing the movement in the stock market. Hence there is a ground for further research to find out the affects of oil price fluctuation on stock market index considering weekly or more objectively the daily data on oil price and stock index.

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