

OIL PRICE FLUCTUATION AND ITS IMPACT ON FOREX MARKET

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ABSTRACT

The foreign exchange market is the market in which currencies are bought and sold against each other. It is the largest market in the world. This paper investigated the long-term relationship between crude oil prices and exchange rate, the sample consists of crude oil prices in India and US Dollar Exchange rate in terms of Indian Rupee, especially real exchange rate. The study used annual data from 2013 to 2017. Descriptive statistics, Unit Root Test, Co- integration Test, Granger Causality Test, GARCH Model used for the study. The study confirmed the presence of normality and stationarity.

Keywords: Crude Oil Price, Oil Price Fluctuation, Foreign exchange Market.

INTRODUCTION

The foreign exchange market is the market in which currencies are bought and sold against each other. It is the largest market in the world. The daily turnover in the market was estimated to be over US\$ 1 trillion. Bulk of turnover in foreign exchange market is accounted for by a small number of currencies – the US dollar, Deutschmark (DM), Yen, Pound sterling, Swiss franc, Canadian dollar, Dutch guilder, Italian lira and the Belgian franc. The foreign exchange market is an over-the-counter market. A few giant multinational banks deal in the large number of currencies, in large amounts and often deal directly with each other without using brokers. Their transaction can have significant influence on the market. In the second tier are large banks that deal in a smaller number of currencies and use the services of brokers more often. Lastly there are small local institutions which make market in a very small number of major currencies against their home currencies. Globally, the price of oil has been a significant determinant of the level of economic performance. The real exchange rate is a significant factor in the development process of an economy as both its level and stability are important in increasing exports and private investment. The transmission mechanisms through which oil prices influence the Real Exchange Rate (RER) include both supply and demand channels. The supply side effects are related to the fact that crude oil is a basic input in production and consequently, an increase in oil price leads to a rise in the cost of production of non-tradable goods will thus increase leading to an appreciation of the RER. The RER is also indirectly affected through its relation with disposable income. A rise in oil price reduces the consumers spending power. This will reduce the demand for non-tradable and therefore to a fall in their prices. This will depreciate the RER. The presents study focus on the relationship between stock index return and crude oil price.

REVIEW OF LITERATURE

Robert A. Amano and Simon Van Norden (1998) explain that the real oil price captures exogenous terms-of-trade shocks and why such shocks could be the most important factor determining real exchange rates in the long run. **Agnes Benassy- Quere, Velarie Mignon and Alexis Penot (2005)** concluded that Oil price fluctuation in domestic currency may be quite different depending on the exchange rate regime. For instance during 2002-2004, rises in oil price was partly cushioned in the Euro Zone. **Hamisa Sadi Ali (2015)** emphasized therelevance of crude oil in the global economy can never be ignored considering its significance as a source of earnings to some countries and as a source of energy that roll various economic activities in the world. **Onoja, Joan Egbe (2015)** examines therelationship between oil prices fluctuations and economic activity since the early 1970s. Empirical studies show that these oil price shocks were immediately followed by worldwide recession and periods of inflation spurred considerable research. **Yasmina Safaa Salah (2015)** investigate the relationship between oil price and the black market exchange rate US Dollar/Algerian Dinar through an empirical analysis using an ECM Model. Results show that a co-integration relationship is detected between oil and black market exchange rate in Algeria, with unilateral trend causality in short and long run time horizon from oil prices to black market exchange rate.

The above studies on examining the relationship between crude oil price and exchange rate were mostly made on developed countries and hence the present study was made to examine the relationship in India.

STATEMENT OF THE PROBLEM

Oil imports represent a significant fraction of the trade balance for energy-dependent economies. In the case of small open economies with floating exchange rate, the variability in oil prices is expected to have a large impact on the relative value of the currency. This relationship between the price of oil and the exchange rate has been established by the literature for oil-producing countries but not for oil-importing countries.

NEED OF THE STUDY

The determination of causation linkage between crude oil and exchange rate has important policy implications. The fluctuations in exchange rate impair the economic growth. In these analyses, reducing price volatility of oil also proves exchange rate stability and hence economic growth. On the other hand, the information about possible relationship between oil prices and exchange rate plays crucial role in making long term energy policies. The determining of causation linkage, policy makers might tend to alternative energy sources in order to reduce oil dependency and oil demand. In the light of results, the study also provides information for global investors in investment decision. By monitoring oil prices, investors may forecast US dollar movements. Besides, financial market actors and speculators could be able to identify portfolio diversification options in exchange rate markets. Secondly, this study also attempts to compare time domain and causality which generates test statistics at different frequencies across spectra. The link between the oil price and US dollar exchange rate, which can be observed since the 1990s, is attracting the interest of many economists. The fact that commodity prices are mostly denominated in US dollar naturally leads to a question regarding the relationship between commodity prices and the dollar exchange rate.

OBJECTIVES OF THE STUDY

- To analyze the normality and stationarity of crude oil prices and exchange rate.
- To investigate the causality between crude oil prices and exchange rate data.
- To analyse the volatility of crude oil price and exchange rate.

HYPOTHESIS OF THE STUDY

- **H01:** There is normality and stationarity in the crude oil prices and exchange rate.
- **H02 :** There is no causal relationship between crude oil prices and exchange rates.
- **H03:** There is no volatility in the crude oil prices and exchange rate.

METHODOLOGY OF THE STUDY

PERIOD OF THE STUDY:

The present study covered the time period of the five years from 2013 to 2017.

SAMPLE SELECTION

The sample consists of crude oil prices in India and US Dollar Exchange rate in terms of Indian Rupee, especially real exchange rate. The real exchange rate is calculated using Nominal Exchange Rate data and inflation rates in India and USA.

SOURCES OF DATA

The study mainly depends on secondary data. The required secondary data for this study were collected from the websites namely [www.rbi and www.investing .com]. Further the other related information was collected from the various website, journals and Books.

TOOLS USED FOR THE STUDY

The tools to be used for the study is

1. Descriptive statistics
2. Unit Root Test
3. Granger causality test
4. GARCH model.

ANALYSIS AND INTERPRETATION

Table 1 Descriptive Statistics Result for the Crude Oil Prices and USD/INR Real Exchange Rate

	EXCHANGE RETURN	OILRETURN
Mean	0.00674	-0.01002
Median	0.00492	-0.01181
Maximum	0.06272	0.25273
Minimum	-0.04251	-0.20767
Std. Dev.	0.02182	0.08475

Skewness	0.40741	0.09520
Kurtosis	3.22392	3.95423
Jarque-Bera	1.72565	2.28811
Probability	0.42197	0.31853

Source: Data collected from [www.rbi](http://www.rbi.in) and www.investing.com and computed through E-views 7

Table 1 shows the results of descriptive statistics for crude oil prices and USD/INR exchange rate return during the study period from January 2013 to December 2017. It is to be noted that the summary statistics about sample return, namely mean, median, maximum, minimum, standard deviations (SD), skewness, and kurtosis were used to analyse the data. The mean and median value of exchange rate returns were positive whereas and crude oil prices recorded negative values. The maximum value of crude oil return is higher than the exchange rate revealing more changes in the crude oil price. The standard deviation of crude oil price is highest thus conforming wider fluctuations in crude oil prices. Jarque- Bera test supports the assumption of Normality.

Table 2 Unit Root Test result for the Exchange Rate and Crude Oil Price from 2013 to 2017

Null Hypothesis		t-Statistic	Prob.
Augmented Dickey-Fuller test statistic		-5.61888	0.00
Test critical values:	1% level	-3.5504	
	5% level	-2.91355	
	10% level	-2.59452	

Source: Data Collected from [www.rbi](http://www.rbi.in) and www.investing.com and computed by using E-views 7.

Table 2 shows the stationary test for crude oil price and exchange price returns during the study period. It can be observed from the table that the probability value of ADF-T statistics was found to be statistically significant. Further ignoring the sign the t-statistic value was greater than the test critical value at 1%, 5%, and 10% level. Hence we reject the null hypothesis **H01**: "There is no stationarity in the crude oil prices and exchange rate".

Table 3 Granger Causality Test Result for the monthly Oil Price and Exchange Rate Returns

Null Hypothesis:	F-Statistic	Prob.
Oil Return does not Granger Cause Exchange Rate Return	0.25726	0.7742
Exchange Rate Return does not Granger Cause Oil Return	0.31326	0.7325

Source: Data Collected from www.investing.com and www.rbi.in and computed by using E- views 7.

Table 3 presents the results of Granger Causality. From the table, it is clear that F-statistic of 0.25726 and 0.31326 with a probability of 0.7742 and 0.7325, indicating the no causality. Thus the null hypothesis **H02**: "There is no causal relationship between crude oil prices and exchange rates" is accepted.

Table 4 Showing the GARCH (1, 1) model Result for the Crude Oil Prices and Real Exchange Rate Return Price

Mean Equation				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.00672	0.003039	2.211416	0.027
Oil Return(-1)	0.005041	0.041678	0.12096	0.9037
Variance Equation				
C	0.000158	0.001386	0.113952	0.9093
GARCH(-1)	0.672492	2.900755	0.231834	0.8167

Source: Data Collected from www.rbi.in and computed by using E-Views

Table 4 explains the result of mean equation returns and variance equation of GARCH (1, 1) Model for crude oil during the study period. It indicates that in the mean equation the co-efficient was not found to be significant at 5% level (Oil Return (-1) is not significant). Further, the variance equation has the co-efficient of GARCH (1, 1) (0.672). It is to be noted that the co-efficient of GARCH (1,1) Parameters was less than one (0.672). It is found from the analysis that the volatility has higher persistent. Hence, the null hypothesis **H03** "There is no significant volatility crude oil prices and exchange rate" is accepted.

FINDINGS

- The descriptive statistics of this study shows that the most of the price index shows a distribution. The result using the rupee-dollar parallel exchange rates and the effective exchange Rate evidenced the effect of anticipated and unanticipated exchange rate movement.
- The result of standard deviation explains the level of risk about crude oil price and real exchange price.
- There was no significant volatility crude oil prices and exchange rate.

SUGGESTIONS

- The investors can invest in the crude oil price commodity as the mean return was high. However, market information need to be considered before investing. Since, oil price had its impact on exchange price the investors are suggested to carefully monitor the oil price.
- The investors are advised to calculate the basis (oil price-real price) before investing to ensure no losses are borne. The regulators must bring option contract in foreign exchange market so that the investors can take advantage of long and short positions.

CONCLUSION

The present study analyse the stationary of crude oil prices and exchange rate there is no stationary in the crude oil prices and exchange rate. The study found the role of crude oil prices in the information and price discovery of US Dollar in the Foreign Exchange Market. The study confirmed the presence of normality and stationarity.

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WEBSITES

- [www.investing.com/crude oil price index](http://www.investing.com/crude-oil-price-index)
- www.investopedia.com
- [www.forex market/definition.](http://www.forex-market.com/definition)