

CASUAL RELATIONSHIP BETWEEN FOREIGN EXCHANGE RATES ON GOLD AND CRUDE OIL PRICES IN INDIA

Dr. (Mrs).D.Vijayalakshmi¹, S.Monica²

¹Assistant professor , ²Ph.d Research scholar

Department of commerce (aided)

P.S.G.R.Krishnammal college for Women ,Coimbatore , India .

Abstract: The Exchange rates plays a pivotal role in international trade, foreign exchange transactions, balance of payment and enhances the economic health. The movement in exchange rate is affected by several macro economic variables, such as, interest rate, inflation rate, money supply and national income. In India, Rupee has experienced the trend of depreciation against foreign currencies due to rise in imports of petroluem products. The increase in imports of the goods has created a demand for the foreign currency in the country. India imports more of gold and crude oil products, where it has an impact on the current account deficit in the Indian economy. With this background this paper focuses on the casual relationship between exchange rate, gold prices and crude oil prices for the period of five years from 2013-14 to 2017-18. The tools, namely, Unit root test, Granger casuality test, Correlation and Regression analysis have been applied in the study to analyse the data. The study has concluded that an increase in imports have affected the movements of exchange rate .

Keywords: International trade, current account deficit, Indian economy.

I. Introduction

Gold is a precious metal with which mankind has a long and very intimate relation. It is considered as a symbol of purity and good fortune. The gold rate in the market depends on the demand and availability of the metal. The gold price has become unpredictable in commodities market (**Amutha rani and Vijayalakshmi, 2014**). "According to **GATA (Gold Anti Trust Action Committee)**, about 15,000 tonnes of gold has been loaned by the Central banks to the Bullion banks for which they paid about 1per cent per annum. Exchange rate is one of the most important policy variables, which determines the trade flows, capital flows and Foreign Direct Investment, inflation, international reserve and remittance of an economy. Many economies, specially Asian countries encountered crisis in 1990s due to imprudent application and bad choice of this policy (**Nusrate Aziz, 2008**). Exchange rate is the rate at which one currency can be exchanged with other currency between two countries. It is important to establish an exchange rate between two countries to facilitate the trade of goods and services priced in different currencies. The Indian production and exploration segment is dominated by public sector companies . Oil and Natural Gas Corporation (ONGC) has the highest market share followed by Oil Indian Limited (OIL). It is estimated that over 70 per cent of the total market and remaining 30per cent by private corporations. The prime participants of the industry are Indian Oil Corporation, Bharat Petroleum Corporation, Oil and Natural Gas

Commission, Hindustan Petroleum Corporation, Reliance Industries, Patronet LNG, Essar Oil, BP, Gas Authority of India, Bharat Petroleum Corporation and Adani Gas.

II. Review of literature

Divyang Joshi (2011) has analysed the effect of exchange rate volatility on gold and crude oil prices in India using correlation and regression. A sample of five years weekly data from 2005 to 2009 for the variables gold, crude oil and exchange rate INR/USD have been collected from financial websites. The results of the study have shown that there is an inverse relationship between dollar, crude oil and gold prices. **Sajal Ghosh** has examined the impact of oil price shocks on nominal exchange rate volatility by applying GARCH and EGARCH models. A daily observations for the time period from July 2, 2007 to November 28, 2008 have been taken for the study. Increase in crude oil prices have depreciated the Indian currency against US dollar to a large extent. The results have shown that oil price shocks have effect on the exchange rate volatility. **Hidayathullahi and Mahammad Rafee** (2014) have studied the effects of oil price and exchange rate of Indian rupee against US dollar using time series data from 1972-73 to 2012-13. The variables, such as, imports of crude oil, world crude oil prices and exchange rate of rupee / US dollar have been taken for the study. Multiple linear regression model has been used to state relationship between the variables and it has resulted that exchange rate is directly influenced by imports. They have concluded that if the import of crude oil continues to rise up then the crude oil future price also increases where it strengthens the dollar against rupee. So the rupee is kept continuously depreciating in the international market. **Kanika Khera and Inderpal Singh** (2015) have analysed the effect of macro economic factors influencing Indian rupee value against US dollar in post globalisation period by applying correlation and regression analysis. The variables, such as, inflation rate, lending interest rate, foreign direct investment, gross domestic product and current account deficit for 22 years covering the period of 1991-2013 have been collected from RBI bulletin and world bank website. They have found that GDP is positively correlated and the variables, such as, lending interest rate, inflation rates and current account deficit are negatively correlated with exchange rate. The regression results have shown that the exchange rate is 85.2 per cent dependent on independent variables

Objectives of the study

The study focuses on the following objectives

- To analyse the causal relationship between exchange rates, crude oil and gold prices.
- To examine the impact of exchange rates on gold and crude oil prices.

Hypotheses used in the study -The following null hypotheses are framed :

H₀₁: Exchange rate has no significant relationship between gold prices and crude oil prices.

III. Research Methodology

Source of data

The study is descriptive in nature and covers a period of five years from 2013-14 to 2017-18. Secondary data have been collected from Handbook of statistics on the Indian economy, RBI monthly bulletins, World Bank, journals and reports.

Period of study

The study covers a period of five years of monthly data from 2013-14 to 2017-18.

Tools used for the study

The data collected have been analysed with the statistical tools, such as, Percentage growth rate, mean, standard deviation, Coefficient of variation, Skewness, Kurtosis, Jarque bera test, Unit root test, Granger causality test and regression analysis

IV. Result and discussions: Data collected from secondary sources were analysed and presented

Table 6 Summary statistics of exchange rate of Indian rupee against US dollar, Pounds sterling, Gold prices and crude oil prices for the period 2013-14 to 2017-18.

	Mean	S.D	C.V	Skewness	Kurtosis	Jarque bera test	P-values
INR/USD	57.44	8.37	0.05	-0.43	-1.49	1.48	0.04
INR/ GBP	87.79	11.01	0.20	-0.55	-1.22	1.35	0.00
Gold prices	26444.54	7021.54	0.25	-0.35	1.72	0.25	0.01
Crude oil prices	84.54	24.54	0.08	0.17	1.64	0.70	0.23

Source: Computed.

Table 1 portrays the descriptive statistics of exchange rate of Indian rupee against US dollar, Pounds sterling, Gold prices and crude oil prices for the period 2013-14 to 2017-18. The Mean, Standard deviation, Covariation, Skewness, Kurtosis, Jarque bera test and Number of observation for the sample period 2014-2018 are presented. The mean value is Rs. 57.44 for US dollar and Rs. 87.79 for pound sterling. The mean of gold and crude oil prices stood at Rs.26444.54 and Rs.84.54 respectively. The standard deviation of dollar and pound sterling stood at 8.37 and 11.01 and the gold and crude oil prices stood at 7021.54 and 24.54. The CV of gold prices shown higher level of 0.25 per cent and it is followed by crude oil prices at 0.15 per cent. The exchange rates of Indian rupee against dollar, pound sterling and gold prices are negatively skewed and crude oil prices is positively skewed. There is presence of platykurtic among all the currencies taken for the study. Jarque bera test have shown there is presence of positive normal distribution and probability values among the currencies taken for the study.

Unit root test- Augmented Dickey Fuller test

To know the stationarity of the variables, Unit root test- Augmented Dickey Fuller test have been applied.

H_0 : There is no presence of unit root in the variables

Table 2 Unit root test

Variables	With trend		Without trend		Result
	t-statistic	p-values	t-statistic	p-value	
INR/USD	-9.041	0.0351	-8.987	0.0497	S
INR/GBP	-6.732	0.000	-6.975	0.0000	S
Gold prices	-5.936	0.000	-6.070	0.0000	S
Crude oil prices	-4.561	0.0251	-7.133	0.000	S

*Significant at 1 per cent level. S*stationary

Table 2 shows the results of Unit root test –Augmented Dickey Fuller test for the variables taken for the study. The results of t- statistic and p -values state that there is stationary among the exchange rate of Indian rupee against US dollar, Pound sterling, gold prices and crude oil prices. All the variables are found to be stationary at level itself. The p-values indicate that the variables are stationary at 1 per cent level of significance.

Granger causality test

To understand the causal relationship – unidirectional and bidirectional relationship between the exchange rates, Gold and crude oil prices granger casuality test have been applied.

Table 3 Granger casuality test

Null hypothesis	F-statistic	Probability
Crude oil does not Granger Cause Gold prices	0.54897	0.4613
Gold prices does not Granger Cause crude oil prices	1.24232	0.2690
USD does not Granger Cause Gold prices	2.81930	0.0879*
Gold prices does not Granger Cause USD	0.09221	0.0762*
GBP does not Granger Cause Gold prices	6.26945	0.0147*
Gold prices does not Granger Cause GBP	0.68118	0.4121
USD does not Granger Cause Crude oil prices	0.43948	0.5096
Crude oil prices does not Granger Cause USD	1.35861	0.0247*
GBP does not Granger Cause crude oil prices	0.61691	0.4350

Crude oil prices does not Granger Cause GBP	3.41890	0.0689*
GBP does not granger cause USD	1.29381	0.2594
USD does not granger cause GBP	2.49662	0.0118*

Source: computed, Significant at 0.05 level

Table 3 shows the results of Granger causality test, there is bidirectional relationship exist between Gold prices and USD which means that both variables are affected by each other respectively. GBP and gold prices, Crude oil prices and USD, Crude oil prices and GBP, USD and GBP have a unidirectional relationship between the variables, which implies that the variables are affected and found to be statistically significant at 0.05 per cent level.

Regression analysis

To study the impact of exchange rate on gold and crude oil prices regression analysis have been done

H₀: Gold prices have no significant relationship between the variables.

Table 4 Regression
Dependent variable - Gold prices

	Regression Coefficients	Std. Error	Beta	t	Sig.
(Constant)	239.641	13.478			
USD	-1.471	.784	-.367	-1.876	Ns
GBP	-1.894	.525	-.743	-3.604	**
Crude oil prices	.004	.001	.451	6.251	**

Source : Computed

Model summary

R	R Square	F	Sig.
.891	.795	10.62	**

Source : Computed

Table 4 shows the regression analysis between the exchange rates, gold and crude oil prices for the period 2013-14 to 2017-18. In the analysis Gold prices has been taken as dependent variable and the independent variables, namely, USD, GBP and Crude oil prices have been taken for the study. The results of regression analysis has shown that $R^2=0.795$ revealing that the gold prices are significant with the

independent variables. The calculated Fvalue 10.62 is higher and the null hypothesis is rejected. The above analysis resulted in the following multiple regression equation.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3$$

$$\text{Gold prices} = 239.641 + (-1.894)\text{GBP} + (.004)\text{Crude oil prices}$$

H₀: Crude oil prices have no significant relationship between the variables.

Table 5 Dependent variable - Crude oil prices

	Regression Coefficients	Std. Error	Beta	t	Sig.
(Constant)	-19787.31	5029.26			
USD	48.056	139.17	.093	.345	**
GBP	395.600	86.86	1.206	4.554	Ns
Gold prices	105.082	16.81	.817	6.251	**

Source: Computed

Model summary

R	R Square	F	Sig.
.793	.628	14.12	*

Source : Computed

In the analysis Crude oil prices has been taken as dependent variable and the independent variables namely USD, GBP and Gold prices have been taken for the study. The results of regression analysis has shown that R²=0.628 revealing that the crude oil prices are significant with the independent variables and influences the movements of exchange rate. The calculated Fvalue 14.12 is higher and the null hypothesis is rejected. The above analysis resulted in the following multiple regression equation.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3$$

$$\text{Crude oil prices} = -19787.31 + 48.056 \text{ USD} + 105.08 \text{ Gold prices.}$$

Conclusion

This paper has examined the effects of crude oil prices and Gold prices on exchange rate of Indian rupee against US dollar using monthly data from 2013-14 to 2017-18. The crude Oil prices and imports are rising continuously in the Indian economy. This increases the demand for the currency which strengthens the dollar against rupee and Indian rupee is continuously depreciating. This leads to purchasing power of

Indian currency in the international market. The production of domestic oil supply and control over the oil demanded products will be the policy measure to overcome exchange rate depreciation and its impact on the Indian economy.

Reference

- Amutha Rani and Vijayalakshmi, Importance of Gold in Indian Economy , Market survey, March 2014.
- Franchis cherunilam (2012) ,“International economics” Tata Mc Graw Hill education private limited,New Delhi,5th edition
- Nirupam Bajpai (2011) “Global financial crisis,its impact on India and the policy response” working paper no.5,Columbia global centers
- Robert J.Carbaugh (2000), ““International economics” South-Western college Publishing, United States,7th edition
- How does gold impact the economy, The Economic times, 2018
- As crude plays spoilsport, RBI likely extend pause on rate cut, The economic times, 2017, Retrived from <http://economictimes.indiatimes.com/articleshow/62241947.cms>.
- www.indiabudget.nic.in – Economic survey
- [www . rbi.org. in](http://www.rbi.org.in).