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## AN EFFECT OF EXCHANGE RATE ON GOLD AND CRUDE OIL PRICES

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### Abstract

*This paper analyses the impact of US Dollar exchange rate on gold and crude oil prices, using the data series for the period 1991-2014. The rapid rise in gold and crude oil prices has become a burden on the poor and developing countries, including India, who spend roughly half of their household incomes on their derivative products. In many countries and regions, gold and crude oil price inflation is higher than aggregate inflation and contributing to underlying inflationary pressures. The investors always look for the various investment avenues which increase their risk-adjusted returns and add diversification. Since ages, gold is preferred as the one of the major investment option especially by the Indian investors.*

*The prices of the gold are fluctuating and are affected by the various factors. In this paper we tried to know relationship of the US Dollar with gold and crude oil prices with the help of econometric regression model. The result indicated the significant impact of dollar fluctuation on gold and crude oil prices.*

**Key Words:** *Crude oil prices, exchange rate of USD and INR, Gold Prices*

### INTRODUCTION

There is a common belief that the price of commodities tends to move in harmony with common macroeconomic factors such as exchange rate, gross domestic product, economic output, the rate of employment, the rate of inflation, savings and investment, etc. Among this Oil and gold are the two strategic commodities which have received much attention recently, partly due to its prices and increase in their economic uses.

Gold has a critical position among the major precious metal class, even considered the leader of the precious metal pack as increases in its prices seem to lead to parallel movements in the prices of other precious metals. (Sari et al, 2010). Gold is not only an industrial commodity but also an investment asset which is commonly known as a “safe haven” to avoid the increasing risk in the financial markets. Gold can also be used as one of risk management tools in hedging and diversifying commodity portfolios. Greenspan (1994) cited gold as a “store of value measure which has shown a fairly consistent lead on inflation expectations and has been over the years a reasonably good indicator”. Investors in both advanced and emerging markets often switch between oil and gold or combine them to diversify their portfolios (Soytas et al, 2009).

Crude oil is the world’s most commonly traded commodity, whose price is the most unstable and may lead the price procession in the commodity market. The oil market, which is usually considered to be one of the major world markets, play a significant role in the foreign exchange market. The oil market is influenced by developments in currencies, especially dollars, and sometimes can cause developments in the world’s major currency markets. Factors that influence the price of oil are varied and include political issues, the balance of supply and demand, the status of alternative energy sources and the financial markets.

Gold and oil have a number of common factors that cause the prices of these goods to move in the same direction. For example, devaluation of the dollar normally causes an increase in oil prices and also an increase in gold prices, but a direct relationship between oil prices and gold prices does not exist. It is remarkable that rising global oil prices will increase inflation, causing investors to direct their investments to the investment tools resistant to inflation. Gold, as

a relatively stable reserve, can serve as the best choice. In this case, the demand for gold rises and it will become dearer. Yet increases or decreases in gold prices do not have an effect on oil prices.

When the value of the dollar increases, gold will be more expensive for buyers using other currencies, therefore reduced demand for gold which in turn reducing its price. Again, a decrease in the value of the dollar reduces the gold price and increases gold demand, and then rising demand will eventually increase prices. Overall, the value of the dollar and the gold price are inversely related.

In recent months, due to increasing international concern over government debt and the continued decline of the dollar, global demand for buying gold has increased drastically. While the growth of gold demand in India and China has in recent years had a significant impact on gold price developments, now the entire world's central banks are turning to the gold market, which is a major factor behind the increased gold price.

International gold prices have risen almost unabatedly in the last few years, though there was one large correction in 2008. From July 2011 the pace of increase in gold prices has, however, accelerated further and in the third quarter of 2011, gold prices rose much faster. The spurt in gold prices which occurred in 2011 took place in the background of worsening of financial and economic scenarios initially in the US, followed by the debt problems in the European Countries. As a result of these adverse global developments and "flight to quality", gold is emerging as a "safe" asset for investment purposes.

The impact of the rise in international gold prices reflects domestic prices as well. Despite the sharp recent price rise, in India, demand for gold has sustained, not only as a component of safe savings but also due to its social and cultural importance. Therefore, movements in gold prices in India are of keen interest to all segments of the society including investors. From the policy perspective, gold's price rise has raised a concern as to whether a future crash in gold prices would have financial stability implications.

India exports 70% ([www.commodityonline.com](http://www.commodityonline.com)) of its crude oil requirement from the OPEC countries. So, the oil price fluctuation affects the economy. The payment made for import is in foreign currency, hence, the appreciation or depreciation of rupee value affects the prices of oil. The RBI had reportedly estimated that every one dollar rise in the international price per barrel of crude oil adds \$600 million (around Rs2, 800 Cr) to the country's oil import bill. In this new era, it assumes that the crude oil price is the perfect example of macroeconomic factor which can affect the movements of stock market and also the economy of any country. Any variation in crude oil prices can have both direct and indirect pressure on the economy of the different countries. India fulfils its major crude oil requirements by importing it from oil producing nations Therefore; any upward and downward motion of prices is closely tracked in the domestic market place. Continuous instability in crude oil has its impact on the industrial segments also.

In the short term, price of crude oil is influenced by many factors like socio and political events, status of financial markets, whereas from medium to long run it is influenced by the fundamentals of demand and supply which thus results into self price correction mechanism.

**Relation between Gold and USD** -Talking about the dollar, it is the widely accepted currency as the means of both international & domestic payments. Due to rising & falling exchange rates & domestic barrier for foreign trade, the export-import related business face problem. In addition

to that, the importance of hard currencies in household's savings proportion and the government intervention in domestic currency valuation, has made public much more aware of the exchange rate issues. During the period of frequent USD reserve shortfall in 2003, government intervene and sold USD 20 million to commercial banks to import gold during the domestic 25% gold price hike over a year, for the safety of economic transaction.

**Relation Between Crude Oil and USD-** The general observation-like a weak dollar makes crude oil cheaper, which in turn, increases the demand from buyers with stronger currencies, thus escalating the price of crude oil or the fall in the rupee primarily being, attributed to the high crude oil prices. From 1974, dollar linked officially with oil and the most international oil trades were invoiced, delivered and settled in US dollar. The fluctuation of dollar exchange rate not only has a direct impact on the stability of world's economy and international oil price in petroleum industry, but also has an important impact on the oil policies in oil exporting countries and oil consumption countries.

Looking to the importance of USD in the international transaction as well as the Indian economy, we tried to know the USD exchange rate effect on the gold and crude oil prices in India. This is because the US Dollar has remained to be the most dominating foreign currency used for trading and investment throughout the period of this study.

#### **LITERATURE REVIEW**

Various studies have been conducted on this topic and many researchers have come up with different macroeconomic factors which are related with the gold and crude oil markets. And therefore we have tried to cover them in our literature review.

**Mu Lan et al. (2010)** using time series method tried to explore the impacts of fluctuations in crude oil price, gold price, and exchange rates of the US dollar vs. various currencies, on the stock price indices of the United States, Germany, Japan, Taiwan, and China respectively, as well as the long and short-term correlations among these variables. The results show that there exist co-integrations among fluctuations in oil price, gold price and exchange rates of the dollar vs. various currencies, and the stock markets in Germany, Japan, Taiwan and China.

**Narayan et al (2010)** opine that inflation channel is the best to explain the linkage between oil and gold markets. A rise in oil price leads to an increase in the general price level, which is the characteristic of Inflation. Several studies have established this link empirically (e.g. Hunt, 2006; Hooker, 2002) which came up with the results that when the general price level (or inflation) goes up, the price of gold, also increases. This gives rise to the role of gold as an instrument to hedge against inflation. On the other hand, when gold price fluctuates due to changes in demand for jewellery, being hoarded as a reserve currency and/or being used as an investment asset, it is unlikely to have anything related to oil return (Sari et al, 2010).

**Zang et al. (2010)** in his study analysed the co integration relationship and causality between gold and crude oil prices. The study concludes that consistent trends between the crude oil price and gold price with significant positive correlation. The study further suggests that long term equilibrium between the two markets.

**Ai Han et al. (2008)** in his study proposes an interval method to explore the relationship between the exchange rate of Australian dollar against US dollar and the gold price, using weekly, monthly and quarterly data. With the interval method, interval sample data are formed to

present the volatility of variables. The ILS approach is extended to multi-model estimation and the computational schemes are provided. The empirical evidence suggests that the ILS estimates well characterize how the exchange rate relates to the gold price, both in the long-run and short-run.

**Roach (2008)** in his study tried to answer the question of how oil prices are determined & what factors have the biggest effect on them knowing the fact, that oil price fluctuations can have such a large impact on the world. He explained that the trend, for the most recent period of economic activity (1992-2008) and in economic models, is for the dollar to lead the price of oil. Higher oil prices were correlated with a stronger dollar from the beginning of this period until roughly 2003. This was the trend because for the most part, petrodollars were recycled back into the US economy and it was dominant in terms of attractiveness of exports and assets. However, this correlation was non-existent in 2004 and turned negative in 2006.

**Sari, Hammoudeh, and Soytas (2008)** made a comparison of the daily prices of gold, silver, platinum, palladium, & oil against each other & the USD/EUR exchange rate. They found that there does tend to be relatively strong correlation within the precious metals prices. Among the precious metals examined, platinum shared the highest positive correlation to oil price movement. Their result further showed that oil price was not strongly correlated with the exchange rate or any of the precious metals & they went on to speculate that this may be due to the way that the oil price is regularly managed by OPEC & manipulated by the speculated markets. This is different than the four other commodities studied that all showed a close relationship with the US/Euro exchange rate. It appears that oil is a commodity that does not follow the norm.

**Eric et al. (2006)** by using co-integration techniques suggests that there is a long- term relationship between the price of gold and the US price level. Second, the US price level and the price of gold move together in a statistically significant long-run relationship supporting the view that a one percent increase in the general US price level leads to a one percent increase in the price of gold. There was a positive relationship between gold price movements and changes in US inflation, US inflation volatility and credit risk. The study also found a negative relationship between changes in the gold price and changes in the US dollar trade-weighted exchange rate and the gold lease rate.

## OBJECTIVE

- To analyse the effects of Rs/\$ exchange rate on the price of gold.
- To analyse the effects of Rs/\$ exchange rate on the price of crude oil.

## RESEARCH METHODOLOGY

This research study is based on secondary data which is gathered from time span of 9 years and 2 month from January 2005 to February 2014 month wise to portray a larger view of impact of dollar fluctuation on crude oil & gold prices. The analysis is attempted at two level, firstly analysed gold price and Rs/\$ exchange rate value interrelation whereas secondly, analysed the relationship between crude oil prices and Rs/\$ exchange rate value with the help of Regression econometric model in SPSS 17.0.

## ANALYSIS

*Analysing the effects of Rs/\$ exchange rate on price of gold.*

In a floating currency system where the dollar is only priced relative to other floating currencies, it is increasingly difficult to use currency movements as a measure of the economy. Still, gold is a very popular hedge for large institutions against devaluation in the US dollar. As the value of the dollar goes down relative to other major currencies, the price of gold tends to move higher. The movements in the dollar, however, can be as much attributable to changes in other national economies as in the US itself.

**Regression Analysis:**

The above Econometric Regression table reflects that R<sup>2</sup> value is .548 from which it is evident

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>	R Square
<b>Intercept</b>	-1.4111	0.488	-2.893	0.004622927	-2.38	-0.44	-2.38	-0.4	0.548994
<b>log exchange</b>	3.3379	0.291	11.47	0.0000000000	2.761	3.915	2.761	3.91	

that 54.8% of the variation in the dependent variable (Gold price) are explained by the variation in the independent variable (Exchange rate). It shows that gold price is having more influence of Rs/\$ Exchange rate. And remaining 45.2% of the variation is because of other variables.  $\beta_1$  value is 3.33 measures the elasticity of Y (dependent variable-Gold Price) with respect to X (Independent variable- Rs/\$ Exchange rate). Gold price is elastic with respect to Exchange rate as  $\beta_1$  is greater than 1 & shows that exchange rate is more responsive to change in gold price as compared to other variables. In simple words that if the exchange rate goes up by 1 percentage point, the gold price goes up by 3.33 percentage point.

**Analysing the effects of Rs/\$ exchange rate on price of Crude Oil**

Generally, it is seen that weak dollar makes the crude oil cheap, which in turn increases the demand from buyers with stronger currencies, thus escalating the price of crude oil or the fall in the rupee primarily being attributed to the high crude oil prices.

**Regression Analysis:**

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>	R Square
<b>Intercept</b>	0.512	0.3772	1.3574	0.177478212	-0.2356	1.2596	-0.2356	1.26	0.37934
<b>log exchange</b>	1.829	0.2251	8.1246	0.0000000008	1.38246	2.2747	1.3825	2.275	

Above, Econometric Regression table reflects that R<sup>2</sup> value is .379 that means 37.9% of the variation in the dependent variable (Crude oil price) is explained by the variation in the

independent variable ( $Rs/\$$  Exchange rate). It shows that crude oil is having less influence of  $Rs/\$$  Exchange rate and remaining 62.1% of the variation is because of other variables. Whereas  $\beta_1$  measures the elasticity of Y (dependent variable-Crude oil price) with respect to X (independent variable-  $Rs/\$$  Exchange rate). From the interpretation of the table, it is founded that Crude oil price is elastic with respect to  $Rs/\$$  Exchange rate as  $\beta_1$  is 1.82, that is greater than 1 which means that  $Rs/\$$  Exchange rate is more responsive to change in crude oil price. In other words we can say that if the  $Rs/\$$  exchange rate goes up by 1 percentage point, the crude oil prices goes up by 1.82 percentage point.

## CONCLUSION

The study performed necessary analysis to answer the research question of whether Dollar fluctuation can influence the gold & crude oil prices. The variables are represented by the  $Rs/\$$  exchange rate, gold & crude oil prices. The results are remarkable and useful in understanding the impact of Dollar fluctuation on gold & crude oil prices & their relationship. On the basis of overall analysis it can be concluded that the variables (Gold prices and Crude oil prices) taken are significant and likely to influence by dollar fluctuation. There exists positive relationship between  $Rs/\$$  Exchange rate and gold prices and  $Rs/\$$  Exchange rate & crude oil prices. This study give results that the gold & crude oil prices are elastic with respect to  $Rs/\$$  Exchange rate, indicating that the Gold prices & crude oil prices are driven by dollar fluctuations. But this study is limited to the dependent variables taken in the study, whereas there are many more macroeconomic variables of world as well as domestic level which affect the gold and crude oil prices. Hence this study opens the platform for the researchers to know more in this area and explore the results.

## REFERENCES

- Ai Han, Shanying Xu, Shouyang Wang (2008), Australian Dollars Exchange rate and Gold Prices : An Interval Method Analysis , 7th International Symposium on Operations Research and its Applications (ISORA'08) , Lijiang China, Oct 31-November 3
- Bénassy-Quéré, A., Mignon, V. & Penot, A (2005). China and the relationship between the oil price and the dollar. CEPII Working Paper.
- Chua; J & Woodward, R (1982), Gold as an inflation hedge: A comparative study of six major industrial countries, Journal of business finance & accounting 9, 191-197.
- CAI, J., Cheung, Y & Wong, M (2001), what moves the gold market? The journal of future markets, vol21, NO-3, 257-278.
- Feldstein M. (1980), The effect of inflation on the prices of land & gold. Journal of public economics, 14, 309-317.
- Gujrati, D.N. (2003). Basic Econometrics, McGraw Hill, India.
- Ganesh Mani & Srivyal Vuyyuri, gold pricing in India: An econometric Analysis 2005.
- Perry R. Hinton, Charlotte Brownlow (2012), SPSS Explained, McGraw hill, India.
- Hammoudeh, S., Sari R. and B.T. Ewing (2008). Relationships among strategic commodities and with financial variables: A new look. Contemporary Economic Policy, 27(2), pp. 251-264