GOLD AND OIL PRICE NEXUS USING OLS APPROACH: THE CASE OF OMAN

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ABSTRACT

To investigate the impact of the price of international crude oil on gold price movement in Oman market, this empirical paper has been written. The current study made a new effort to test the reliability and the validity of the model, adopting the very popular Ordinary Least Square (OLS) model, with random shock and past price as independent variable sin relation to the Oman gold market. Simple Regression Model has been used to analyze the relationship having taking care of the normality distribution of residuals, serial correlation and heteroskesticity issues in OLS. Daily international gold and oil price from January 2011 to September 2015 has been used for this study. Results showed that the residuals are suffering from heteroskesticity and serial correlation, and not normally suggested and distributed that there is no influence of the international oil price shock on the gold price movement in Oman market.

KEYWORDS: OLS, Serial Correlation & Heteroskesticity

INTRODUCTION

The gold with distinctive density is defined as the natural trading asset, which could be molten easily, reshaped and measured. In the world economy, there is a trend of market interconnectivity, which is also noticeable in the commodity field, with the most significant representatives being oil and gold. Oil is the most traded raw material, and gold is the very highly traded valuable metal, and these two play a very important role in shaping economy. The connectivity between the oil and gold takes us back to history, when the producers in Middle East exchanged gold for crude oil. The year 1933 had an important milestone, when Saudi Arabia traded the original oil concession only in gold. Many historical events resulted in the huge development of oil and gold markets and there was an important relationship between these two commodities, which was no longer determined only at the payment level.
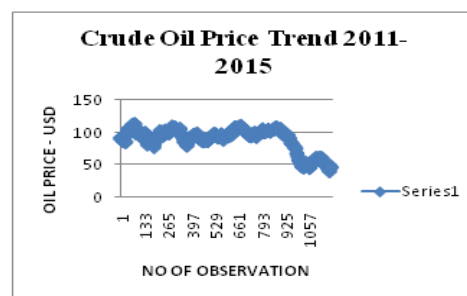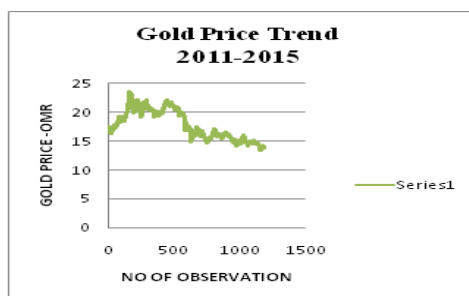
Maximum and minimum gold price per gram and international oil price in Oman market is shown in table-I. The change of minimum oil and gold price during the study period between 2011 and 2012 is 3.07%and17.31%. In 2012-13, the negative change of -22.74% is observed in the gold price on contrary to the previous years, whereas there oil price has seen a positive change of 11.48%. Both oil and gold price has witnessed negative effects during 2013-14 and 2014-15, i.e.,

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-4.74% on gold price and -38.31%, -2849% on oil price, respectively. The maximum gold and oil price were also found to be negative except 2012-13-3.52%, 1.12%, -2.41%, -and 43.15% (oil price) and -5.86%, -5.50%, -18.19%, and -5.95% (gold price).

Table 1: Comparison between Gold and Oil Price Movements 2011-2015

	GOLD PRICE - OMR				OIL PRICE-USD			
	MINIMUM	% of Change	MAXIMUM	% of Change	MINIMUM	% of Change	MAXIMUM	% of Change
2011	16.23	-	23.54	-	75.4	-	113.39	-
2012	19.04	17.31	22.16	-5.86	77.72	3.07	109.39	-3.52
2013	14.71	-22.74	20.94	-5.50	86.65	11.48	110.62	1.12
2014	14.11	-4.08	17.13	-18.19	53.45	-38.31	107.95	-2.41
2015	13.44	-4.74	16.11	-5.95	38.22	-28.49	61.36	-43.15

Source: Data Analysis

REVIEWS OF LITERATURE

Jana Simakova(2011), found using Granger causality test, Vector Error Correction model and Johansen co integration test that there is a long-term relationship between gold and oil prices. **Sujit (2011)** provided that, the change in other variables affects the exchange rate highly. However, the stock market has only minimal role, in affecting the exchange rate. **Young Chang (2011)** has found that, the impact on the gold price by the oil price is non-linear and not asymmetric. Further results reveal a long-run relationship between the oil and gold prices. The observations show that, the gold price can be predicted using the oil price. **Amalendu Bhunia** (2013) showed that, there is a long-term relationship existing between the selected variables. The results of Granger causality test proved that, there should be either no or bidirectional causality among the variables. **Mohd Hussin (2013)** revealed that, the Islamic stock return is affected only by the oil price in Malaysia in short run. It was also proven that, for predicting the Islamic share prices Kijang Gold Price is not a valid variable. **Sindhu (2013)** showed that, there is an inverse relationship between gold prices and US dollars. It is well known that, the gold prices are impact by the crude oil price. Repo rates and gold prices are interdependent. Inflation rates and gold prices are positively correlated and dependent. **Mehmet Balcilar (2014)** showed that, under the low growth regime, the oil price has predictive content for actual output development. Results also revealed that, comparatively with higher growth rate, the low growth state is shorter-lived. **Norasyikin (2014)** found that, there are correlations between the financial variables and commodities among Southeast Asia countries. He also showed the existence of feedback relationship, for exchange rate nexus and stock index.

Poonambassi (2014)

Verified the relationship between the exchange rate of USD, gold price and crude oil price and found the inverse relationship between the gold prices and the exchange rate of USD. On the gold prices, the crude oil prices have shown positive impact.

Statement of Problem

In 2013, due to higher import fees in India and regaining of share markets, in most world nations, the gold prices suffered 28% of its value. Therefore, the attention of the gold investors was shifted, to the securities markets for making faster profits. The theory and the literature demonstrated above, and show the need for the current study in the Oman market. It also provides the economic variables, that need to be tested using econometric models. The literature review shows that most of the studies concentrated, on finding the relationship between the indices return and commodity price.

Some of the studies were performed, to investigate the gold price that is impacted by the oil prices. But, none of the study was conducted relating to the economy of Middle East, Oman in particular, with similar objectives. As per the census in 2014, Oman is the hub of emigrants constituting 43.7% of total population, among which 2.3 million people belong to India, which is the largest emigrant community. Indians buy jewels bars, gold coins and other items intuitively as gold plays a very important role culturally. Raw price data shows that there is a positive linear relationship between gold price and oil price. Therefore, this empirical study focuses to find, whether there is any positive linearity between the oil and gold prices. It also aims to test whether, there is any false regression persisting in outsized samples, with non-stationary time series as provided by Yule in 1926.

METHODOLOGY

The empirical study is based on the research design, using secondary data which includes daily gold price (OMR) and international crude oil price (USD), which was retrieved for the period of 5 years between January2011 and September 2015 from and USA energy information, www.bullion-rates.com/gold/OMR and administration website. This test has been conducted using e-views, to find the reliability and the validity of the variables, such as random shock and oil price by following the 3-step process such as estimation, model specification, and diagnostic checking. The model is stated as $y = \alpha + \beta x + \varepsilon$ Where $y and x$ is called endogenous and exogenous variables, respectively. The α, β and ε are known as intercept, slope and random shock. The estimation of the parameters is done, by adopting the model and the results are shown and discussed and the model fitness is diagnosed, applying Breusch-Pagan-and God frey Heteroskedasticity test, Breusch-Godfrey Serial Correlation LM Test and Jarque-Bera Residuals Normality Distribution Test.

Hypothesis

The below testable hypothesis were outlined, in order to test the importance and model validity.

H_0 = the dependent variable gold price in Oman is not significantly influenced, by the independent variable international crude oil price.

H_a = the dependent variable gold price in Oman is significantly influenced, by the independent variable international crude oil price.

H_{01} = The data series is not suffering from heteroskedasticity.

H_{a1} = The data series is suffering from heteroskedasticity.

H_{02} = The residuals of the data series are normally distributed.

H_{a2} = The residuals of the data series are not normally distributed.

H_{03} = The data series is not suffering from serial correlation.

H_{a3} = The data series is suffering from serial correlation.

RESULTS AND DISCUSSIONS

The best regression model is confirmed, with some features like non-existence of autocorrelation, higher estimated co-efficient of determination, and the existence of normal distribution, in the residuals and heteroskedasticity in the residuals. In diagnosing testing, the calculated p-values should be more than 5%. F- Statistic is estimated to be less than 5%, besides the estimated probability values of independent variable. In the current study, the parameters estimated shown in Table – II, the valid assumptions of the OLS method are completely violated. The model will be considered as a valid one, when the p-values of Breusch-Pagan-Godfrey –heteroskedasticity test, Breusch-Godfrey serial correlation LM test , and Jarque-Bera residuals normality distribution test are more than 5%. On contrary, all the p-values are found to be lesser than 5%. Therefore, it is considered that, the OLS model is not good to predict the relationship, even though the p-values of F-statistic and independent variable are important, with p-values less than 5%. Thus, according to Yule (1926), the regression should be considered to be spurious.

Table 2: Statistical Test Results

Dependent Variable: GOLD_PRICE_GRAM				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
CONSTANT	12.17861	0.336399	36.20289	0.00000
OILPRICE - BETA	0.063281	0.003722	17.00201	0.00000
R-squared	0.19677	Adjusted R-squared	0.19608	
F-statistic	289.0683	Prob(F-statistic)	0.00000	
Breusch-Godfrey Serial Correlation Lm Test:				
F-statistic	62686.64	Prob. F(2,1178)		0.00000
Obs*R-squared	1170.997	Prob. Chi-Square(2)		0.00000
Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	80.43231	Prob. F(1,1180)		0.00000
Obs*R-squared	75.42729	Prob. Chi-Square(1)		0.00000
Scaled explained SS	33.79387	Prob. Chi-Square(1)		0.00000
Jarque-Bera Residuals Normality Distribution Test				
Jarque-Bera	84.20042	Probability		0.000000

Source: Data Analysis

CONCLUSIONS

The observations of the study, conducted during the test period show that, the impact on the gold price by the international oil price, shock in Oman market could not be adequately described, using Ordinary Least Square Model (OLS). It also proves that, the gold price is not influenced by the oil price volatility. While, taking decision on the purchase of gold and investment in Oman, the retail buyers and the investors can ignore the fluctuation in the international oil price. To conclude, this study gives a wider guidance, not to invest in the Oman market, based on the oil price. Rather, they should consider inflation and other economic and, financial factors while formulating the strategies for investment.

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