



ANALYZING THE DETERMINANTS OF GOLD PRICE IN INDIA

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Abstract

India is the largest consumer of gold in the form of jewellery in the world and largest importer after crude oil. Gold is a hybrid commodity which acts both as investment and saving. India is an unique country where both urban and rural investors will invest on gold as risk free asset in their portfolio, this create demand for gold and hence India import more and more gold meanwhile unique designs and skills of Indian jewellery created demand of Indian jewellery worldwide, hence India exports gold jewellery too. Above this gold is used as reserve. According to IMF 58% of countries hold gold as reserve which in-turn acts as driver for currency exchange rate. Due to these dynamic characteristics of gold, the gold price depends upon various factors which drives the gold price fluctuation.

This paper concentrates on the determinants which effects the gold price in India. For this determinants such as currency exchange rate , global gold price in united states(USD), united kingdom(GBP), China(CNY) where the demand for gold is more and the Index of Indian secondary market (Sensex) are taken as dependent variables for the fluctuation of gold price in India. A correlation and regression analysis is done to see the extent of dependency of these determinants on gold price in India.

Introduction

Since the ancient times, gold has been used by mankind. The basic reason for this being its physical properties. Gold act as commodity, as a currency, as a investment and saving. According to history only gold has retained its value during world war, crisis and change of government. Despite the attention gold has to investors, it still is not completely clear what drives the price of gold exactly. To date, no theory exists which shows how inflation and exchange rates and other variables affect the price of gold. This paper seeks to give a review of papers about the structure of the gold market and the determinants of the gold price.

The gold price can be affected by several factors such as US or global inflation, world GDP growth, currency fluctuations, risk aversion, flight to safety, gold leasing rates, interest rates, rate of extraction, sales by central banks, stock prices, and possibly many others. There is an extensive literature that examines jointly several of these factors or focuses on one deemed to be predominant (e.g. currency fluctuations). The empirical analyses tend to find to a various degree statistical linkages between the gold price and various macroeconomic variables, over different periods and through different techniques.

Literature Review

Sherman (1983) has studied on a gold pricing model and the results concludes that gold price has a significant relationship with inflation. Similar a study carried out by Moore (1990) that the gold price movements can be predicted by a leading indicator of inflation. A study by Larson & McQueen (1995) concludes that there is coefficient of unexpected inflation for gold price is significant. Ratanapakorn and Sharma (2007) studied the short term and long-term relationships among the US stock index(S&P 500) and economic variables during the study period from Q1 of 1975 to Q4 of 1998. Blöse (2010) has made an study on unexpected changes in CPI. The result of the study says that gold spot prices do not affect unexpected changes in CPI. Johnson and Soenen (1997) studied about investing in gold will beneficiary for Canada, France, and other countries, during the period of 1978 and 1995.

Research Methodology

Objectives

1. To study the gold price moment in India and its relationship with global gold price.
2. To study the relationship with gold price and the secondary market.
3. To study the effects of change in foreign exchange rate on gold price.

Hypothesis

1. H_0 = There is no correlation between gold price in India and global gold price.
 H_a = There is significant correlation between gold price in India and global gold price.
2. H_0 = Gold price do not increase with increase in INR/USD exchange rate.
 H_a = Gold price increase with increase in INR/USD exchange rate.
3. H_0 = There is no significance difference between gold price in India and Sensex movement.
 H_a = There is significance difference between gold price in India and Sensex movement



Research Method

This study examines various determinants which drives the gold price in India. For this international gold market, foreign exchange rate and Indian Secondary market has been analyzed. In International global market United States of America (USA) and china are taken for the study because of prime demanding players of gold. In foreign exchange rate the Great Britain Pound to the US Dollar(GBP/USD) representative as a world exchange rate. Also the Indian Rupee to the US Dollar (INR/USD) and the Chinese Yuan to the US Dollar (CNY/USD) exchange rates are used, as the Indian and Chinese gold jewellery markets are the prime demanding players in the gold world market are taken for the study. And Indian secondary market index (sensex) has been taken for study to represent the Indian market. A regression and correlation analysis is done to examine the dependency of these determinants to drive the gold price in India.

Sample Selection

The sample data consist of 10 years weekly (2006-2016) close of gold price in India, USA and China, 10 years weekly (2006-2016) close of foreign exchange rate USD/INR,USD/GBP and USD/CNY & 10 years weekly (2006-2016) close of Sensex are taken for study. The sample consists of 523 observations. The collected data are secondary and are collected for financial websites.

Regression and Correlation

This research used descriptive analysis, regression and correlation coefficient. Regression analysis involves identifying the relationship between a dependent variable and one or more independent variables. Correlation and regression analysis are related in the sense that both deal with relationships among variables. The correlation coefficient is a measure of linear association between two variables. Values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense; a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables.

Empirical analysis and Interpretations

1) Correlation Coefficient Matrix Using the Observation From 2/01/2006 to 4/01/2016 (523 Observations)

Table No1: Correlation Coefficient Matrix

	US\$/oz	CNY/oz	rs/10gm	INR/USD	INR/CNY	INR/GBP	Sensex
US\$/oz	1.00						
CNY/oz	0.99	1.00					
rs/10gm	0.97	0.95	1.00				
INR/USD	-0.58	-0.52	-0.74	1.00			
INR/CNY	-0.84	-0.79	-0.92	0.90	1.00		
INR/GBP	0.02	0.07	-0.17	0.48	0.27	1.00	
Sensex	0.81	0.81	0.78	-0.37	-0.67	-0.06	1.00

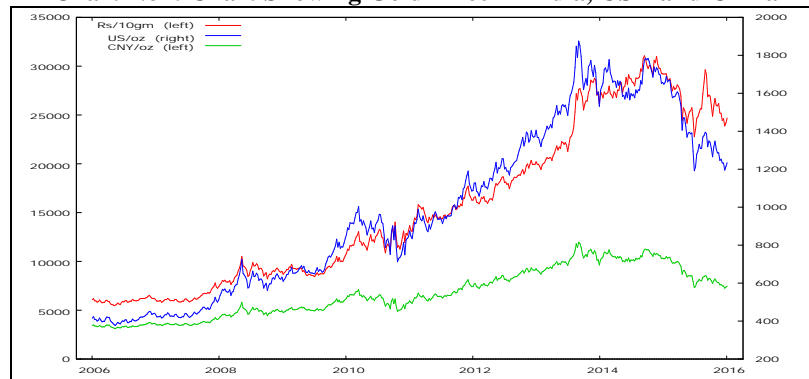
Source: Author computed using secondary data

Interpretation

The result of table no 1 shows that there is high degree of positive correlation between gold price in India, china and USA. It also shows high degree of negative correlation between gold price in India and the exchange rate. This say gold price and exchange rate are inversely related.

2) Gold Price Moment in India and its Relationship with Global Gold Price

Chart No1: Chart Showing Gold Price in India, USA and China



Correlation and t-ratio of gold price in India and in global market



Table No 2: Showing Correlation Coefficient and T-Ratio

Relation between	Correlation Coefficient	t-Ratio	Null hypothesis Accept/Reject
India-USA	0.971345	94.36	reject
India-China	0.949749	69.56	reject
USA-China	0.995836	251.34	reject

Interpretation

The results of table 2 indicate that there is high degree of correlation between the gold price in India and the Global gold market. The critical value for two-tailed and large sample (N=523) $t_{crit}=1.96$, all the t-ratios in the above table is more than the critical value which say we should reject null hypothesis and accept alternative hypothesis, therefore there is correlation between gold price in India and global market.

3) The Relationship with Gold Price and the Secondary Market

Table No 3: Showing Results of ANOVA for Sensex and Gold Price in India

Groups	Count	Sum	Average	Variance
Sensex	523	7672707.77	14314.75	24150207
rs/10gm of Gold	523	8398629.488	15669.08	66217591

ANOVA

Source of Variation	SS	df	MS	F	P-Value	F Crit
Between Groups	4.92E+08	1	4.92E+08	10.8793	0.001004	3.850164
Within Groups	4.83E+10	1044	45183899			
Total	4.88E+10	1044				

Source: ANOVA results using Excel

Interpretations

Since the calculated value of the static $F=10.8793$ which is more than the Critical Value at 5% significance level. Hence it falls in Rejection Region. So we reject Null hypothesis (H_0). And thereby we conclude that there is significant difference between gold price in India and Sensex.

4)The Effects of Change in Foreign Exchange Rate on Gold Price

Table No 4: Correlation Coefficient Matrix of Foreign Exchange Rate on Gold Price

	INR/USD	INR/CNY	INR/GBP	rs/10gm
INR/USD	1.00			
INR/CNY	0.90	1.00		
INR/GBP	0.48	0.27	1.00	
rs/10gm	-0.74	-0.92	-0.17	1.00

Source: Author computed using secondary data

Interpretations

From the results table 04 indicates that there is negative correlation between the gold price in India and the foreign exchange rates, i.e., the correlation between INR/USD to gold price is -0.74 which indicates the rupee will appreciate against dollar with increase in the price of gold. The correlation between INR/CNY to gold price is -0.92 which indicates high degree of negative correlation in turn the rupee will appreciate against Chinese yaun with increase in the price of gold price in India. The correlation between INR/GBP to gold price is -0.17 which indicates low degree of negative correlation in-turn the rupee will appreciate slithly against Great Britain pound with increase in the price of gold price in India.

5)Regression Analysis

Table No 5: Showing Regression Results Aganists INR/USD Exchange Rate (Independent Variable to Gold Price (Dependent Variable)

	Coefficients	Standard Error	t Stat
Constant	3336.55	142.42	23.42
INR/USD	-110407	6677.68	-16.53



Multiple R	R Square	Adjusted R Square	Standard Error	Observations
0.582242901	0.3390	0.3377	360.02	523

Source: Author computed using secondary data in Excel

Interpretation

The results of table 5 indicate that negative relationship between exchange rate and gold price. The standard error are under affordable level when compared to coefficients this means the error in linear relation is not high. In-turn it support the prediction of gold price. Hence we reject null hypothesis and accept alternative hypothesis which says “Gold price increase with increase in INR/USD exchange rate”.

Conclusion

Most of the examined variables within this study turn out to have a significant impact on the price movements of gold in India over the last Ten years. These variables are: Global gold rate such as gold price in USA and China, Indian secondary market, foreign Exchanges such as INR/USD, INR/CNY and we found that conversely, the INR/GBP did not statistically affect gold price movements within the last ten years.

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