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TO STUDY THE INTERRELATIONSHIP BETWEEN GOLD, US DOLLAR AND S&P SENSEX

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ABSTRACT

Gold is increasingly considered as an investment whose value appreciates with the passage of time. Any surplus money with the individual can be invested in security market and gold, main purpose to make investment in gold and securities is to increase the wealth and to take tax concessions under IT Act 1961. In India demand for gold will increase during marriage & festive season. Main purpose of this study is to determine the interrelationship between gold USD & Sensex for a period ranges from 2000 to May 2017. Techniques like time series, correlation & regression has been used to find moment in prices of gold, Sensex and USD. With the help of analysis, we can say that there is a positive correlation between USD, gold prices & S&P Sensex in long run but there is a minimum interdependence between gold price a USD and S&P Sensex. Investor or Analyst can predict value of Gold & Sensex more accurately through US Dollar as interpreted by value of Multiple R.

KEYWORDS

gold prices, USD value, sensex, trend analysis, multiple R and R square.

1. INTRODUCTION

In India, Individuals are highly possessive about the investment in gold especially gold jewellery. Gold is increasingly considered as an investment whose value appreciates with the passage of time. Demand for gold will increase during festival season and during period of marriages in India as people buy more and more of gold and consider it as a safe investment avenue. Gold is also considered as a hedging tool against inflation and can be pledged in order to take loan during financial emergency.

India is one of the fastest growing economies in 2016-17 and comprises of almost 250 million middle class populations and 45% percent population is under 25 years of age and even young individual has a great affinity with the gold. Apart from this even people living in rural areas are very fond of making investment in gold especially jewellery. In the year 2015 rural demand for gold jewellery is 88% and urban demand is 57%. Demand for precious gem is 37% in urban India. 33% of People aged between 18-33 would prefer gold jewellery instead of bars and coins. With 1% increase in income demand for gold also rise by 1%. Demand for gold in India is high because of security feature, Liquidity and to build a diversified portfolio. People usually spent 35-50% of money in buying gold during marriages. Gold contributes 17% to Indian GDP. India is one of the largest importer of gold in the world i.e. USD 39.7 billion. The annual consumption of gold is 500 tonnes about 80% is for jewellery, 15% for investor demand & 5% for industrial use. With increase in imports CAD will deteriorate and this leads to reduction in foreign exchange reserve. With 1% increase in price of gold, demand falls by 0.5%. With increase in imports and high prices the trade deficit of India will increase. Value of gold has been used as the standard for many currencies during gold standard for trade purpose and to determine value of currencies in terms of gold. Gold can be used as a hedging tool against US dollar. The gold prices will move in opposite direction to dollar. Through the analysis of historical data, it can be interpreted that in the year 2011 there was a highest % change in gold prices in comparison to other years. In the initial years there was a positive relation between gold and Sensex as both are increasing but % change in Sensex is more than gold. Gold is traded on a dollar dominated basis. Investment in gold will increase when there was an appreciation in value of dollar against the rupee. Whenever stock market crashes or dollar weaken against rupee, investor prefers gold as a safe haven for investment due to increase in prices of gold against stock prices.

2. REVIEW OF LITERATURE

Dr. Sindhu (2013) Paper focused on the factors which had a positive or negative impact on prices of gold. Factors include US dollar, INR, crude oil prices, repo rate and inflation. Inverse relation between gold prices & US dollar, Positive correlation between gold prices and crude oil prices, Gold prices & repo rates are interdependent on each other and are negatively related with each other. There was a positive relation between inflation and gold prices.

S. Subhashini (2014) Researcher found that gold is a safe investment avenue for investors those who had surplus money and invest for speculative purpose. Currency had a positive relation with dollar; an increase in value of dollar would increase the value of gold prices. Prices of gold are dependent on the value of dollar and dollar would tend to strengthen the prices of gold in long term.

Dr. Poonam Bassi & Bhavna Sharma (2014) Paper explores the association between crude oil prices, gold prices and US Dollar. There is a negative correlation between gold prices and US dollar in short run and positive correlation between gold and dollar in long run. In short run when demand for US dollar fall, investor around the world invest more in gold. There is a positive relation between gold prices and crude oil prices. Gold prices increase in India because gold is a safe investment haven in form of jewellery.

S Nirmala & Deepthy K (2015) Paper attempts to analyze the relationship between gold and crude oil prices. Gold and crude oil have a positive correlation. Both gold and crude oil prices are quoted in dollar, so if dollar weakens against rupee than oil and gold will cost more dollars. Gold oil ratio depicts that more barrels of oil are needed to buy 10 grams of gold. When ratio is falling, oil is becoming more expensive to gold.

Mongi Arfaoui & Aymen Ben Rejeb (2016) Paper highlights that gold prices were impacted by changes in USD. US dollar is negatively affected by gold prices. The trade weighted USD exchange is significantly affected by gold and oil price. Gold can be used as a financial asset for speculation and hedging. Paper also focuses on the concept that there was a significant impact of gold on oil prices.

SP Narang & Raman Preet Singh Researcher tries to find out the existence of unidirectional or bidirectional relationship between gold prices & Sensex. There is an inverse relationship between gold price and dollar. There is positive correlation between stock return and gold prices. According to Granger causality test return on Sensex index does not lead to increase in gold price and rise in gold prices does not lead to increase in Sensex.

3. OBJECTIVES

1. To find the moment of Dollar, Gold Prices & S&P Sensex in last 5 years.

2. To study the casual relationship between dollar and gold prices.
3. To study the impact of dollar on gold prices and Sensex.

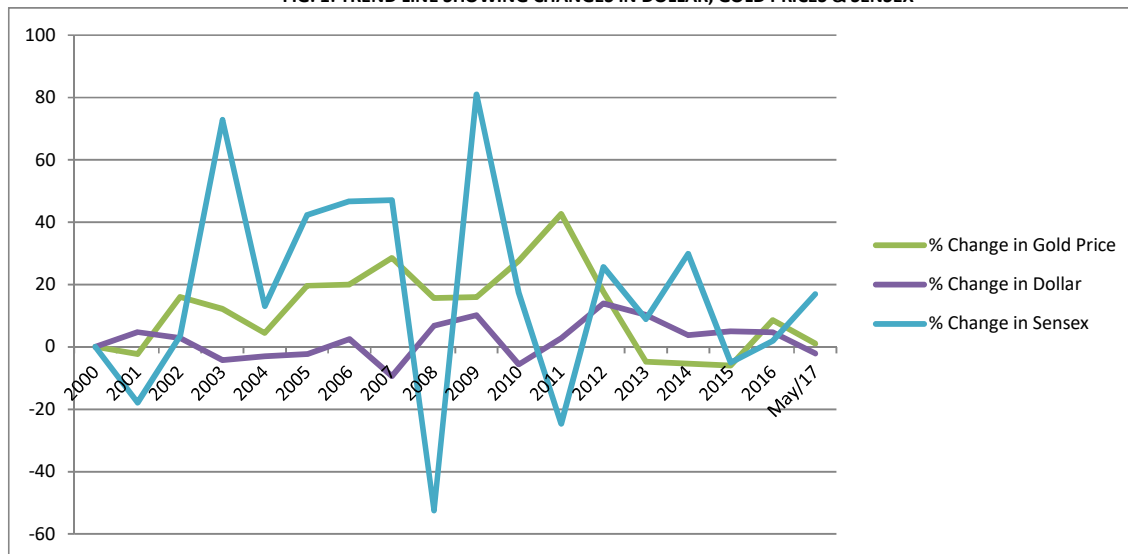
4. RESEARCH METHODOLOGY

- a) Data Collection: Study is based on secondary data which were collected from RBI & MCX website, Books, Journals etc.
- b) Data Analysis: Trend Analysis, Correlation and regression method was used to analyse the data related to prices of gold and USD.

5. DATA ANALYSIS & INTERPRETATION

a) Trend Analysis

FIG. 1: TREND LINE SHOWING CHANGES IN DOLLAR, GOLD PRICES & SENSEX



Interpretation: From above figure one can analyse that in the year 2000 and 2001 there is a fall in gold price by 2.3%, but during the same period value of dollar increase by 4.8%. In the year 2011 prices of gold rise by 42% which is highest since 2000 whereas dollar rise by 2.8%. Value of dollar in percentage form was highest in the year 2012. According to data gold prices rise by 1.1% whereas dollar value falls by 2.1% till May 2017 in comparison to previous year. In the initial years there was a positive relation between gold and Sensex as both are increasing but % change in Sensex is more than gold. After 2008 there was both negative and positive relation as there are other factors which also impact the demand for securities and gold such as oil prices and subprime crises of 2008. In the year 2017 Gold and Sensex is moving in same direction and % change in Sensex i.e. 16% is more than gold i.e. 1%, this indicates that returns from Sensex is more than gold.

b) Correlation Analysis

Karl Pearson's correlation has been calculated to find out relationship between USD & Gold. The correlation has been calculated through:

$$r = \frac{N\sum XY - \sum X \sum Y}{\sqrt{\sum X^2 - (\sum X)^2} \sqrt{\sum Y^2 - (\sum Y)^2}}$$

b.1) Correlation between Gold Price and US Dollar

TABLE 1: CORRELATION OF GOLD PRICE & DOLLAR

	Gold Price	Dollar
Gold Price	1	
Dollar	0.77341	1

Interpretation: The above table indicates that there is a positive correlation between gold price & dollar i.e. 0.77. This indicates that with increase in value of dollar, gold prices also increase in the long run but in the short run there was both positive and negative correlation between dollar and gold prices.

b.2) Correlation between Gold Price and S & P Sensex

TABLE 2: CORRELATION OF GOLD PRICE & S&P SENSEX

	Gold Price	S&P Sensex
Gold Price	1	
Sensex	0.865177	1

Interpretation: The above table indicates that both gold price & Sensex are highly correlated i.e. +ve 0.86% which is more than significant level of 0.5%. This indicates that with 1 Percent change in price of Gold, S&P Sensex will also change by 0.86% in the long run. Both gold and dollar move in same direction. In certain years like 2001, 2008, and 2011 and in the year 2013-14 gold prices and value of S&P Sensex is showing negative relation.

c) Regression Analysis

c.1 Regression between USD & Gold Prices

TABLE 3: REGRESSION BETWEEN US DOLLAR & GOLD PRICES

	Coefficients	Standard Error
Intercept	40.737341	2.476551079
X Variable 1	0.000624305	0.000127924
Multiple R	0.773409928	
R Square	0.598162916	
Adjusted R Square	0.573048098	

Interpretation: Above Table indicates that with 1% increase in value of dollar leads to 0.00062 % increase in price of gold. Standard error is 0.00012 i.e. error in linear relation is minimal and sample is a true representative of population. So it was clear from regression analysis that with the increase in value of currency, prices of gold start rising as people invest money in gold in order to hedge against the risk of increase in value of dollar. From above table it can be interpreted that value of gold can be predicted accurately from USD as multiple R is approaching near 1. R Square is 59% which indicates that a gold price does not act in accordance with the movement of US Dollar.

TABLE 4: REGRESSION BETWEEN US DOLLAR & S&P SENSEX

	Coefficients	Standard Error
Intercept	40.01896243	2.783380763
X Variable 1	0.000701786	0.000154985
Multiple R	0.749458261	
R Square	0.561687685	
Adjusted R Square	0.534293165	

Interpretation: Above Table indicates that with 1% increase in value of dollar leads to 0.00071 % increase in price of gold. Standard error is 0.00015 i.e. error in linear relation is minimal which states that dispersion between sample mean and population mean is minimum and sample is the true representative of population. It can be interpreted that value of Sensex can be predicted correctly from USD as multiple R is 0.74 which is very close to 1 and there was a linear combination of the independent variable (USD) and dependent variable (Sensex). R Square is 56% i.e. below 70% which indicates that a movement in S&P Sensex does not act in accordance with the movement of US Dollar.

6. CONCLUSION

From the above analysis, it may be concluded that percentage increase in gold prices is more than percentage increase in value of dollar, % change in Sensex is more than gold. In certain years' gold & dollar is showing inverse relation in terms of percentage value. Both gold and dollar are positively related in the long run. In the initial years there was a positive relation between gold and Sensex as both are increasing but after 2008 there was both negative and positive relation. In the year 2017 Gold and Sensex is moving in same direction and % change in Sensex i.e. 16% is more than gold i.e. 1%, this indicates that returns from Sensex is more than gold.

On the basis of correlation & regression analysis it may be concluded that there is a positive relation between USD, Gold Prices & S&P Sensex. All the three instruments will move in same direction until or unless other economic factors lead to any inverse situation. There is a minimum interdependence between values of dollar, gold prices & S&P Sensex. Standard error is minimal which shows that deviation between sample mean and population mean is very less. From Multiple R one can predict value of Gold & Sensex more accurately through US Dollar, but movement of both gold and Sensex cannot be explained from movement of USD.

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