



Study on Impact of Currency Fluctuation on the Investment Pattern of Gold

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Abstract:

The link between the Gold price and the US dollar exchange rate, which can be observed since the 1990s, is attracting the interest of many economists. The fact that commodity prices are mostly denominated in US dollars naturally leads to a question regarding the relationship between commodity prices and the dollar exchange rate. There are essentially two approaches examining the links between the gold price and exchange rates in the literature. The first approach examines the real effective exchange rates of specific currencies and uses the real price of oil as a proxy for changes in the terms of trade. Gold is a precious metal which is used both as a property and as a financial asset. Importance of gold has come until today increasing its value and the area of usage. Gold was the fundamental of the money system in the past and then became a reserve tool pegged to Dollar following the Bretton Woods Agreement. In the recent years, demand of gold has expanded with the widespread use of gold both in the industrial goods and in the jewelry sector. However, developments in the financial sector and the alternative financial instruments have decreased the importance of gold as a store of value. Afterwards, demand of gold tends to increase in the recent years, after the financial crises and individuals need for more secure investment tools. In today's world with a rapidly increasing global economy and constantly changing international trade laws and technology, the exchange rate plays a role in valuing farm production and equipment. The liberalization of foreign capital controls and adoption of floating exchange rate regime. Liberalization of foreign capital controls has opened the possibility of international investment and the adoption of floating exchange rate regime has increased the volatility of foreign exchange market. Thus detecting the association between stock prices and exchange rates has become crucial for the academicians, practitioners and policy makers. The return of gold is independent from the return of stocks, these two factors, combined in a portfolio, will diversify the risk of each other. Gold is a very unique asset, which has a static purchasing power to goods and services in the long term. Governments and central banks store gold as a backup for the paper currency. From a long term perspective, adding gold into a portfolio can enhance the ability of the portfolio to bear the risk in the crisis. The effect becomes significant when the risk of inflation and government default is an underlying issue.

I. INTRODUCTION

This paper looks into properties of two other financial assets that are popular in economy, the **United State Dollar** (USD) as a major, liquid, and familiar foreign currency; and **Gold**, a traditional saving vehicle. These financial assets have been so popular that people usually buy them for the purposes of savings, payments, and sometimes hedging against the depreciation of the local currency value. The trades of these assets are also natural and happen as part of daily economic life, therefore have grown up to be liquid markets.

Gold

Gold has long been a symbol of wealth since ancient civilization of Egypt or Iraq. In Asia, large countries such as India and China have also been major importers of gold. This part of study is about gold and the gold market.

Gold futures are hedging tools for producers and users of gold. They provide several amenities: global price discovery, portfolio diversification, continuous trading opportunities, and are alternatives to gold bullion, coins, and mining stocks.

Functions of gold:

The basic uses of gold are: (i) Jewelry fabrication; (ii) Central bank's reserve; (iii) Private investment; and (iv) Industrial applications. Besides these, I consider a number of economic functions of gold that are widely accepted. Some of these functions are related to the low level of economic development in the closed door times, and have still been retained due to the

public habits. Some are related to new concepts of financial assets. The main functions are:

1. Payment currency for commercial deals, such as real estates, automobiles, and commercial settlement among individuals;
2. Savings in kind, including interest-bearing gold certificate of deposit.
3. Commercial calculations for financing and obligations, although real-world transactions are not realized by gold itself;
4. A hedge against other financial assets depreciation in value; and
5. A notion of guarantee.

Dollar

The U.S. dollar is the fiat currency most used in international transactions and is one of the world's most dominant reserve currencies. The U.S. dollar is the world's foremost reserve currency. In addition to holdings by central banks and other institutions, there are many private holdings, which are believed to be mostly in one-hundred-dollar banknotes (indeed, most American banknotes actually are held outside the United States). All holdings of U.S.-dollar bank deposits held by non-residents of the United States are known as "Euro Dollars" (not to be confused with the euro), regardless of the location of the bank holding the deposit (which may be inside or outside the U.S.). The U.S. dollar is an important international reserve currency along with the euro. The euro inherited this status from the German mark, and since its introduction, has

increased its standing considerably, mostly at the expense of the dollar. Despite the dollar's recent losses to the euro, it is still by far the major international reserve currency; with an accumulation more than double that of the euro.

Gold vs. Dollar

Gold continues to be a popular investment. Many investment advisors routinely suggest that investors keep from 10% to 25% of their long term investment portfolio in gold bullion and gold related investments. Like other commodities, the price of gold is ultimately driven by supply and demand. The price of gold can be affected by many factors, such as the US dollar, oil price, interest, inflation, and a variety of politic or economic shock. Historically, the price of gold has been closely linked to exchange rate. There is a negative correlation was observed between the return on gold investments (in U.S. dollars) and the return of the U.S. dollar in the foreign exchange market. Since the euro came into existence as the single currency of 11 of 15 member countries of the EMU on January 1, 1999, it has gradually become as important as the U.S. dollar as an international vehicle currency. Therefore, the relationship between the price of gold and the euro is considered as an interesting topic as well. Inflation is one factor, among others, contributing to the depreciation of a domestic currency, which in turns reduces the nominal price of domestic assets. In such a case, as gold price can rapidly adjust to the inflation rate, gold has the value-preserving ability. However, under special economic conditions, gold price may not always do this, specifically due to unique market competition, transaction costs or country-specific characteristics. The U.S. dollar depreciation has at least two impacts on the prices of gold and silver. First, the dollar depreciation will lower the gold and silver prices for investors outside of the USA to increase their demand for gold and silver, which will raise the gold and silver prices in the U.S. dollar. Second, the dollar depreciation will likely to raise the U.S. inflation rate. As a result, gold and silver, as inflation hedges, attract more investors in the USA. Finally the price of itself goes high in the U.S. dollar. The prices of gold and silver will increase when the U.S. dollar gets weak, and vice versa. The U.S. dollar index is a common measurement of the relative value of the U.S. dollar against other currencies, or a measurement of the relative purchasing power of U.S. dollar. In general, when the U.S. dollar gets weak, the U.S. dollar index goes down. But that is not always the case because the U.S. dollar index reflects RELATIVE purchasing power rather than REAL purchasing power. Something interesting might be found through the test of the relationship between silver and the U.S. dollar index. The goal of this paper is to examine the relationship between price returns of Gold and Dollar. Particularly, I attempt to address following questions: Is there a causal and directional relationship between gold and oil prices? Is the relationship between their price returns weak or strong, symmetric or asymmetric, linear or nonlinear?

The Gold Standard

It is worthwhile spending some time considering the history of the relationship between gold and the US dollar in order to understand why they still hold such a pull over each other today. The association developed from the use of gold and silver standards to set the values of currencies in the past. In these monetary systems, the value of a unit of currency was tied to the value of a specific amount of gold or silver. The US dollar was originally tied to a bimetallic standard, based on both gold and silver, but it moved to a gold standard after 1900, which it remained on until 1971. The gold stabilized the

value of the currency, but it had to be abandoned whenever the currency faltered, in order to protect the gold reserves. The ties were temporarily cut during the Civil War, the First World War and the Great Depression. Once the separation was made permanent, a new kind of relationship between the currency and the commodity arose, in which both were freed to play new roles in the global economy. The US dollar became a true fiat currency, traded on foreign markets and used as a reserve currency without risking the US gold reserves, while the price of gold was freed from the restraints that had been imposed on it by financial policies designed to keep currencies under control.

An inverse relationship

The freeing of the US dollar from the gold standard has enabled it to fluctuate more widely, while the value of the gold remains stable, making it a safe harbour for investors in times of uncertainty, as a hedge against inflation and recession. The value of the gold remains stable in comparison to currencies, but its price in any given currency can fluctuate as the perceived value of that currency changes. The fluctuations in its price in US dollars reflects confidence in the currency, as the dollar revalues itself in relation to gold. Thus, the price of gold tends to move in opposite directions to the value of the US dollar. It is in understanding the subtleties of this relationship that an appreciation of the history of the US dollar's association with gold can be useful, in order to predict when the inverse correlation is most likely to be triggered and how this can be used to one's own advantage when investing.

Confidence in Currencies and When It Fails

The historical association of the gold standard still holds a strong psychological sway over investors today and shapes the policies of many global banks. When the US dollar is in trouble, investors and global banks stocking their reserves tend to abandon it in favour of gold. Conversely, if the US dollar is appreciating, banks can begin to shift their reserves from gold into currency, raising the value of the dollar relative to gold. However, this inverse relationship is not as precise as the link between a currency and a gold standard. Fluctuations in the US dollar do not always show a negative correlation with the price of gold. For example, a crisis in another currency while the dollar remains stable can drive you the prices of both gold and the US dollar as foreign investors use both as a safe harbor. The history of the currency's relationship with gold, and particularly the manner in which the gold standard had to be temporarily abandoned during wars and depression in the past, can indicate the types of situations that will trigger the instinct to turn to gold and bring the inverse relationship into play, thus opening up investment opportunities.

The Economic Crisis

One such opportunity arose with the onset of the global economic crisis in 2007-8, which triggered renewed interest in gold as a safe harbor investment. The example of the Great Depression enabled many investors and policymakers to predict this shift towards gold. Economic uncertainty during the 1930s drove up demand for gold so much that the government was forced to suspend the gold standard in order to prevent overseas banks from emptying the country's reserves as they abandoned their reserves of US dollars in favor of the more reliable option. Another important factor that influenced the increase in the value of gold was the fact that it was at least in part, the abandonment of the gold standard that had enabled the wild fluctuations in the markets that gave rise to the crisis in the first place. Freeing the currency from the

value of gold had destabilized the dollar in a manner that allowed enormous economic growth, but which also allowed bubbles of an unprecedented scale to swell and burst. Both the instinct to turn to gold in troubled times and the influence of an unfettered dollar on the crisis caused the demand for gold to grow. The flocking of investor the safe harbors occurred early in the crisis, with money.co.uk noting increased interest in the reliability of gold and fixed rate bonds, and reporting that 31% of investors were predicting that gold prices would continue to rise even as record highs were reached in 2009. These predictions proved true, as confidence in gold continued to grow, and new issues raised even greater doubts about the security of the US dollar, to the extent that some commentators have called for a return to the gold standard in order to protect the currency.

Trouble Economies Highlight Stability of Gold

Any looming economic trouble that is expected to affect the value of currencies such as the US dollar will create a shift towards gold. The approach of the US debt ceiling is no exception to this rule, and it has the potential to create another climb in the value of gold as confidence in the US dollar is shaken once more. Even if a solution is reached in time, many investors will remain cautious about the US dollar. Meanwhile, the price of gold has been demonstrating its inverse relationship to confidence in the currency particularly clearly as opinions about the course of negotiations has shifted between optimism and pessimism over the course of the crisis. Whenever optimism that a solution is near peaks, the price of gold drops a little. Gold futures fell to a three month low early on October 15 as expectations of a solution appearing drew investors away from safe harbor options. However, any indication that negotiations are stalling or that the deadline for a solution may be missed, results in a move in the opposite direction. Indications that disagreements were arising once again in the house, causing the effort to find a solution to the debt ceiling crisis to stall once more, resulted in a rise in the price of gold during afternoon trading on the same day. Gold looks set to remain an important safe haven in the near future, even if an agreement can be made to raise the debt ceiling and shift this problem forwards into the future. The fluctuations that have occurred as a result of the debt crisis only serve to emphasize the importance of gold as a safe haven from the troubles that plague the economy.

II. REVIEW OF LITERATURE:

Long run & Short run relationship

Koutsoyiannis (1983) The author utilizes adaptive expectation as a model to price the gold in short-run. The daily gold price data run from 1979 through 1981. Meanwhile, this research also investigates the factors influencing gold demand and driving the demand and supply curve shift. He concludes five factors such as *Economic factor*, *Geopolitical factors*, *Precautionary factors*, *Commercial factors*, *Non-speculative supply of gold*. **Ciner (2001)** Gold and silver have historically been seen as close substitutes for each other, and are usually considered as tools to reduce risks in investment portfolio. It means a long-run interdependency and stable relationship exists between the price of gold and silver. , **Ciner** thinks that these two commodities have different important uses respectively. Therefore, it can be argued that separate fundamentals determine the prices of gold and silver and the prices should move independently, implying that the co integration should be rejected. **Escribano and Granger** have tested whether the co integration exists in spot and futures market. They argue that

the dependency between gold and silver becomes less after 1990. Base on their remark, **Ciner** examine the interactions between gold and silver futures prices between 1992 and 1998, and find the co integration tests do not support a stable long-run relationship between gold and silver pieces in futures market. **Lucey and Tully(2006)** Gold and silver both of these commodities are precious metals that can be used to back currency and used as currency. In general, I expect the gold and silver price would be affected by the same factors. However, the diversification benefits will tend to decline as the correlations become increasingly positive and strong. Thus, to assess the diversification benefits of gold and silver , an examination of co integration is required. This study re-examines the results of **Ciner**, who claims that the historically stable relationship between gold and silver has broken down in the 1990s, and indicate that in the long run the stable relationship historically observed between gold and silver has been maintained. However, in the short run, there are significant periods when it is weakened or broken. **Yue-Jun (2008)** have analyzed different aspects of this interdependence among the macroeconomic variables over the recent years. Most of the studies have used co-integration and error correction modeling techniques to isolate and identify the long-run equilibrium relationships among these variables. These studies are an important addition to our understanding of the co-movements of these variables and allow us to make appropriate prediction about the future co-movements. **Diebold and Yilmaz (2009)** have used a simple but different technique to capture the so-called spillover effects or the interdependence among the economic variables using the forecast error variance decomposition methodology. They have noted that spillover effects are time varying and the nature of the spillover indices depend on the measurement standards used. Spill over mechanism developed by **Diebold and Yilmaz** to analyze the interdependence of returns and volatilities of four important macro-variables: These are gold prices, exchange rates for dollar as dollar is the international reserve currency, price of oil, and the stock prices as measured by **Dow Jones Industrial Average**. **VuongQuan Hoang (2004)**: the paper focuses on time series properties, mainly returns at different frequencies, and tests the weak-form efficient market hypothesis. The entire test rejects the efficiency of both gold and foreign exchange markets. All time series exhibit strong serial correlations. **Thai-Ha Le, YounghoChang(2011)** This study employs the bounds testing approach to co integration to investigate the relationships between the prices of two strategic commodities: gold and oil and the financial variables (interest rate, exchange rate and stock price) of Japan – a major oil-consuming and gold-holding country. In the short run, only gold price impacts the interest rate in Japan. Overall the findings of this study could benefit both the Japanese monetary authority and investors who hold the Japanese yen in their portfolios.

Relationship between Exchange Rate and Gold Price

Baker and Van Tassel (1985) indicate the value of the dollar is likely to be important for two reasons. One is dollar denominated assets are an alternative investment for investors and changes in the value of the dollar are an important part of the opportunity cost of holding gold, another one is a rise in the value of the dollar will lead to a fall in the dollar gold price, if the price of gold is stable in foreign currency. **Shouyang Wang (2008)** examine the 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. They introduce ILS and the OLS approach estimates is increasing from weekly data to quarterly data, since the lowest frequency point data lost the most information of volatility. **Sjaastad and Scacciavillani (1996)** identify the effect of major currency exchange rates on the prices of internationally traded commodities. In this research, the authors select gold as a representative of commodities. A highly homogeneous commodity, gold is traded almost continuously in well organized spot and future markets. He concludes the European currency bloc, real appreciations or depreciations of the European currencies have great effects on the price of gold in all other currencies. **Wang Zenan (2012)** analyzes the relationship between silver price, gold price and U.S. dollar index and its change before and after the U.S. subprime mortgage crisis, especially focusing on the dynamics of silver price. The data used covers a period from January 2, 1986 to January 31, 2012. The methodology in this study includes cointegrated VAR model and Granger causality test. **Dooley(1995)** The hypothesis that exchange rate movements reflect country-specific shocks is indirectly supported by reasoning that country-specific shocks should also be reflected systematically in the price of gold and by confirming that gold price movements have explanatory power with respect to exchange rate movements. **Bahmani and Sohrabian (1992)** studied the causal relationship between U.S. stock market (S&P 500 index) and effective exchange rate of dollar in the short period of time. Their theory established bidirectional causality between the two for the time period taken. However, co integration analysis failed to identify any long run relationship between the two variables.

III. OBJECTIVES OF THE STUDY:

- To examine the relationship between gold and dollar
- To observe the investment pattern in gold due to currency fluctuations (dollar).

A. Need of the study:

As all the research papers I went through were conducted in foreign countries mainly in U.S. and Japan. Thus, there is a need to see the relevance of their findings in India.

B. Limitation of the study:

Time factor is the major constraints in doing this research project as there are various other macroeconomic factors that revolves around this concept and I have taken only **Gold price in INR, Gold price in Dollar and USD/INR exchange rate.**

IV. RESEARCH METHODOLOGY:

This chapter presents a description of the research design, research objectives, scope of the study, sample design, research instruments, data collection sources and the tools that I have used in my research for analysis. Research methodology is way to systematically solve research problem. In it I study various steps that are generally adopted by researcher in studying research problem along with the logic behind them. It is necessary for a researcher to know not only the research methods/ techniques but also the methodology. It may be noted, in the context of planning & development that significance of research lies in its quality and not in quantity. Researchers should know how to particular research techniques, but they also need to know which of these methods

or techniques are relevant and which are not and what would they mean and indicate and why?

A. Research objective:-

I have reviewed some literature and research. The majority of researches intend to examine the relationship between the U.S. dollar and gold price. The euro, however, is getting more important and expected to affect the price of gold. In research, I also consider the euro as an important factor influencing the price of gold and try to investigate the relationship between the euro and the price of gold. Once I find out the relationship between exchange rate and the price of gold during opposite currency period, I will be able to give investors some suggestions.

B. Scope of the study:

This study is mainly focus on the Gold and dollar relationship in **US** and **India**. The prices of gold and the US dollar share different relationships in different circumstances. Here's throwing light on some of them. Gold is considered to be a hedge against inflation, recession, and other times of uncertainties, especially due to its high demand and finite supply. This precious metal was, for a long time in history, used as currency, and is still a safe haven for investors. Gold is one of the most widely discussed metals due to its prominent role in both the investment and consumer world. Even though gold is no longer used as a primary form of currency in developed nations, it continues to have a strong impact on the value of those currencies. The currency price of one country gets stronger and/or weaker against another country's currency on a daily basis, but what exactly does that mean for those who don't trade in the forex market? Currency exchange rates affect travel, exports, imports and the economy.

C. Data Collection:

I have taken secondary data in my research. This data I have collected from several websites.

D. Research instruments:

MS Excel, E-views

E. Research/ Analytical Tool:

The tests, tools and techniques used in my study are as follows:

- Correlation statistics
- Unit Root Test
- Granger Causality Test

F. Hypothesis

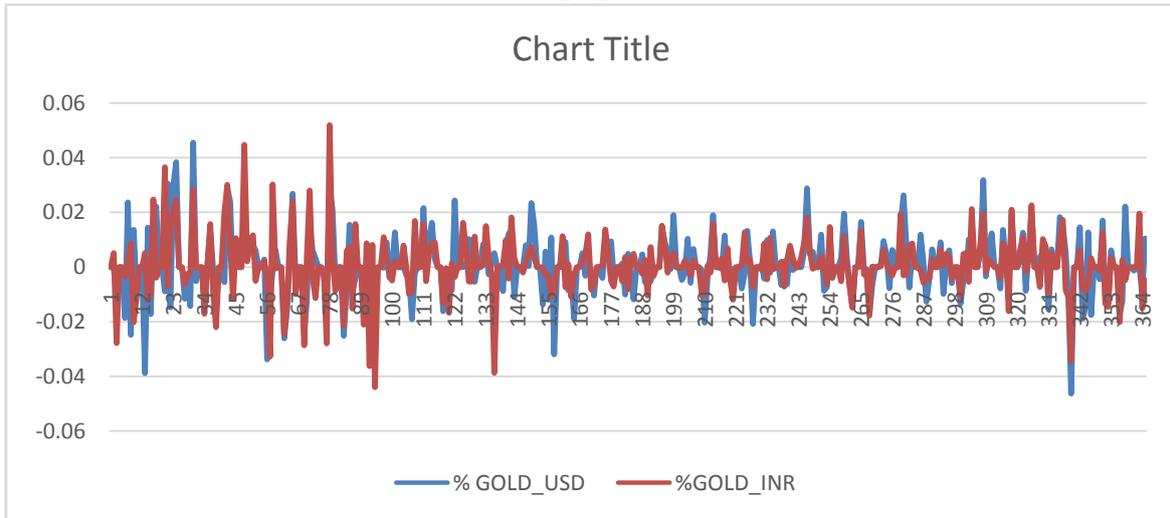
- Null Hypothesis (H0):
- Exchange root has Unit root
- Gold INR has Unit root
- Gold USD has Unit root
- Gold INR does not cause Exchange Rate
- Exchange rate does not cause Gold INR
- Gold USD does not cause Exchange Rate
- Exchange rate does not cause Gold USD

V. DATA ANALYSIS & INTERPRETATION:

To ascertain the relationship among Gold and Dollar with the exchange rate fluctuations, I have first applied the correlation statistics followed by Unit Root Test which is preliminary for applying Granger Causality Test to meet the objectives of my study.

A. GOLD PRICE IN USD and INR RELATION :

2012:

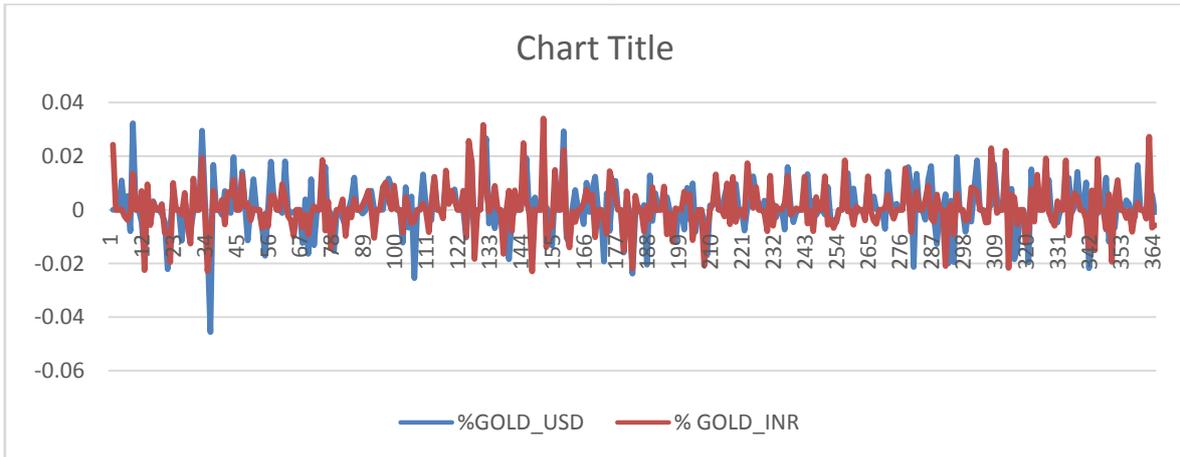


Interpretation:

On 2012, the data is (0.528779165) which shows that there was a positive correlation between Gold prices in USD and

INR. Which implies that as one security moves, either up or down, the other security will move in the same direction.

2013:

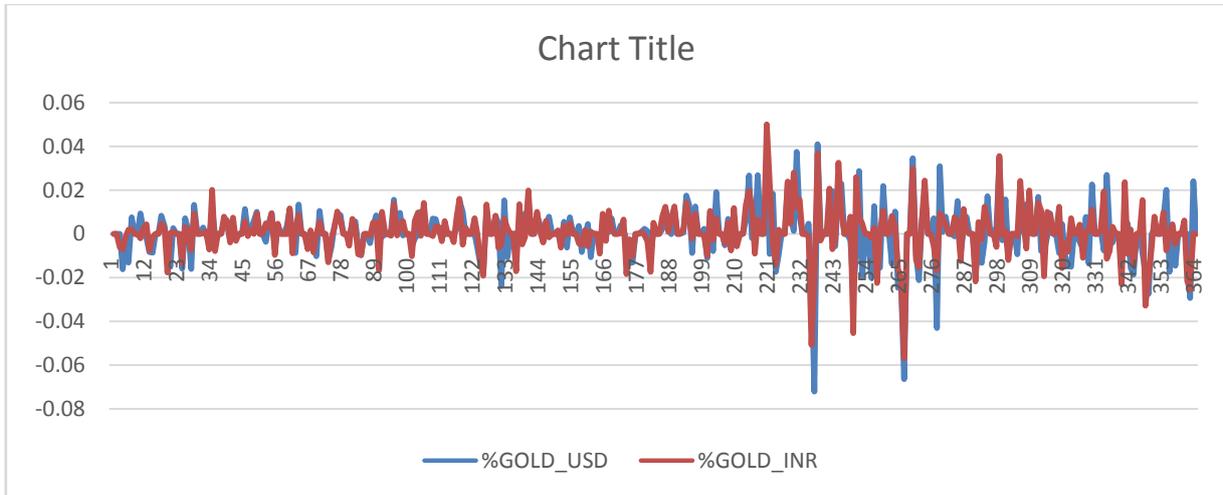


Interpretation:

On 2013, the data is (0.416466475) which shows that there was a positive correlation between Gold prices in USD and

INR. Which implies that as one security moves, either up or down, the other security will move in the same direction.

2014:

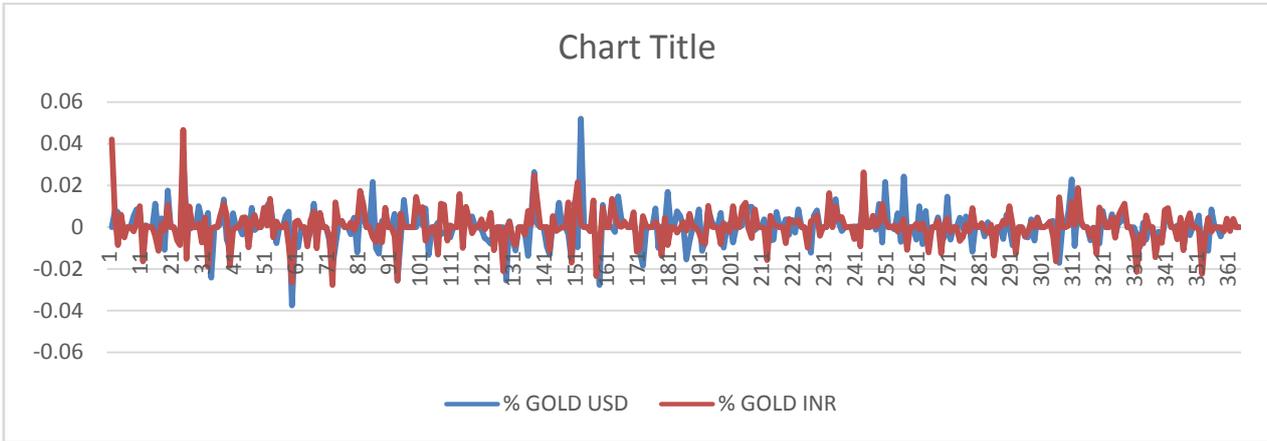


Interpretation:

On 2014, the data is (0.630002281) which shows that there was a positive correlation between Gold prices in USD and

INR. Which implies that as one security moves, either up or down, the other security will move in the same direction.

2015:

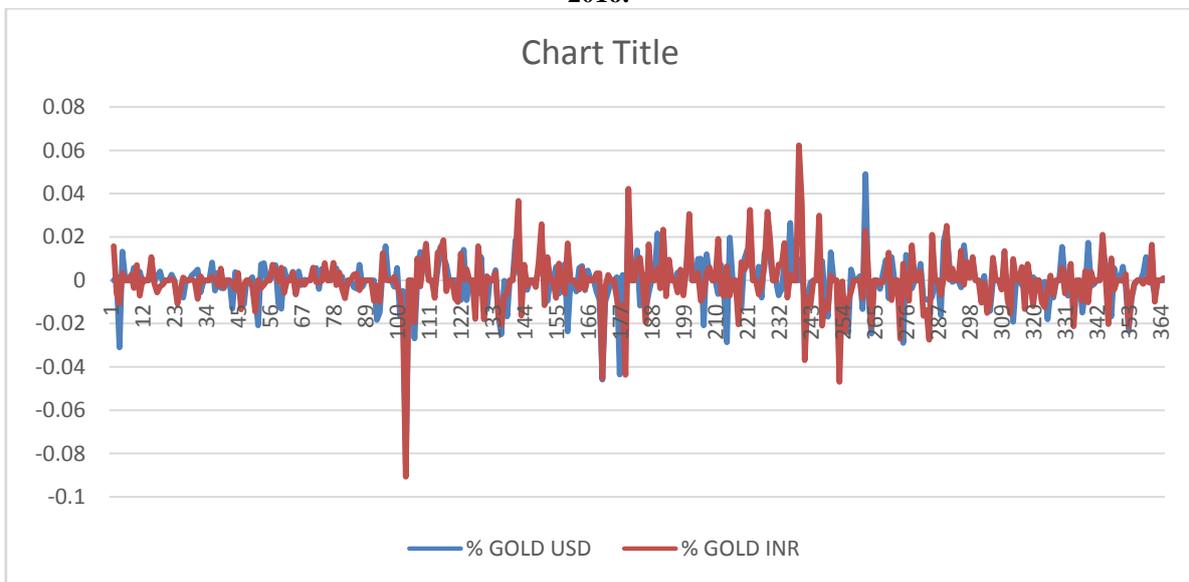


Interpretation:

On 2015, the data is (0.370818074) which shows that there was a positive correlation between Gold prices in USD and

INR, which implies that as one security moves, either up or down, the other security will move in the same direction.

2016:



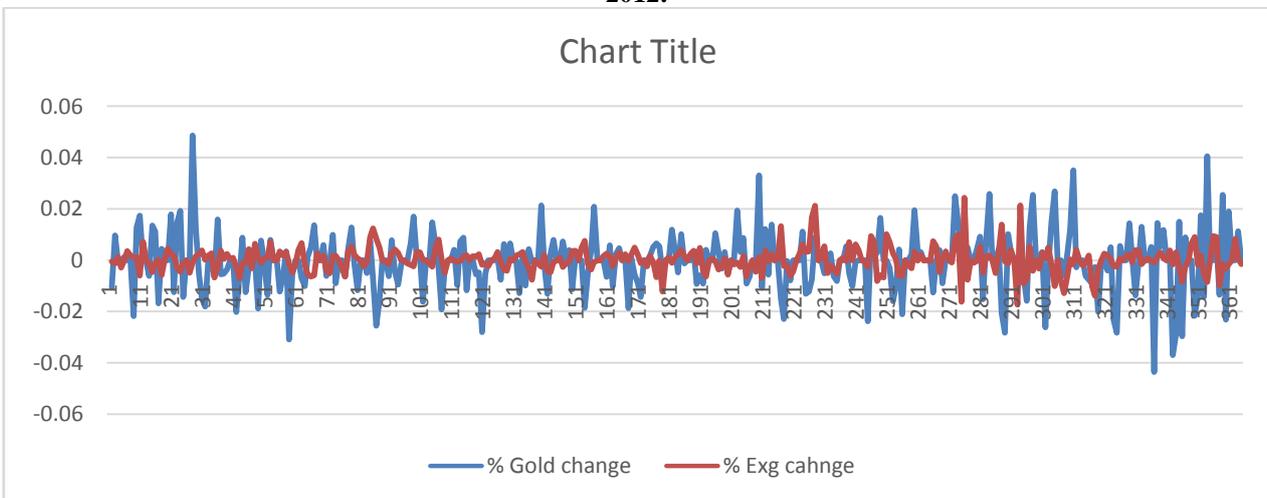
Interpretation:

On 2016, the data is (0.547479983) which shows that there was a positive correlation between Gold prices in USD and

INR. Which implies that as one security moves, either up or down, the other security will move in the same direction.

B. Relationship with Gold price in USD and Exchange rate for the period 2012-2016

2012:

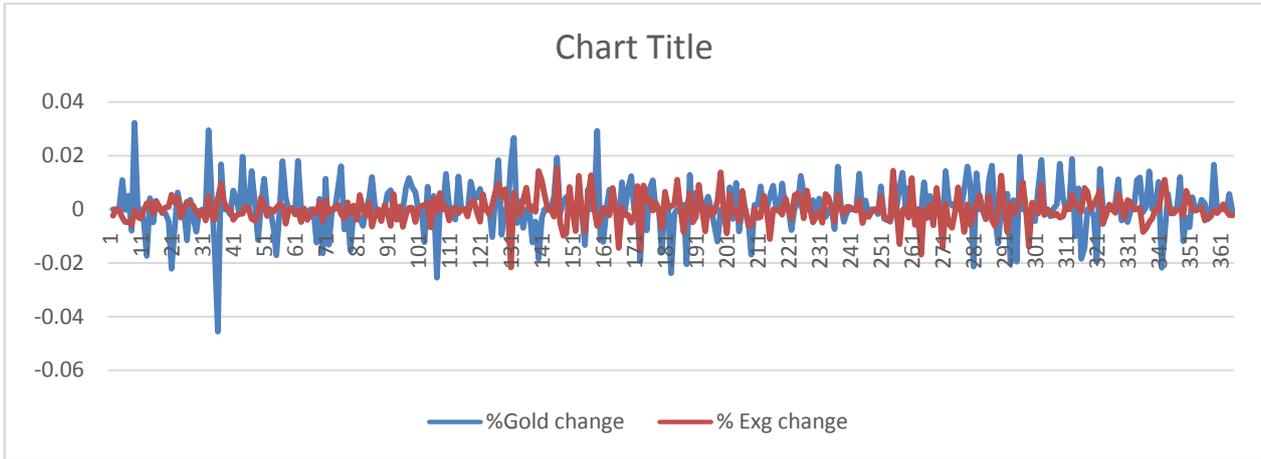


Interpretation:

The correlation for the period 2012 is -0.0211213, which indicates that there is inverse relationship between Gold price in USD with exchange rate. This states that due to some

economic factors it will effect the exchange rate i.e. the exchange rate will decreases with the increase in price of Gold in USD.

2013:

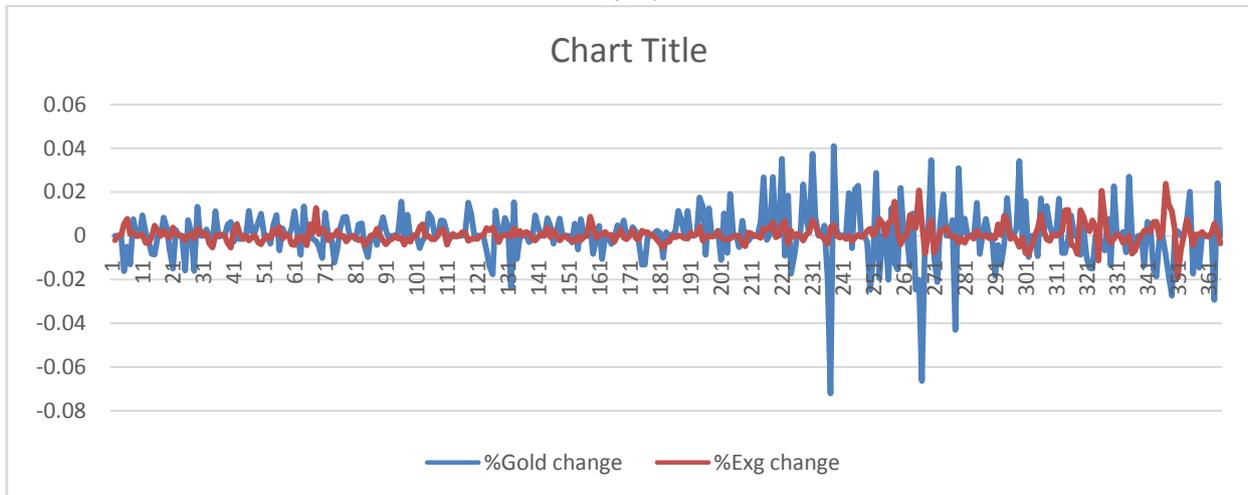


Interpretation:

In the year 2013, the correlation between Gold price in USD and exchange rate is 0.04773, which indicates that there is a positive relationship between them. Due to political as well as

inflation rate is high which leads to decrease in price of Gold in USD. The major reason for the fluctuation in this year is due to economic global crises happened which had crashed the market as a whole.

2014:

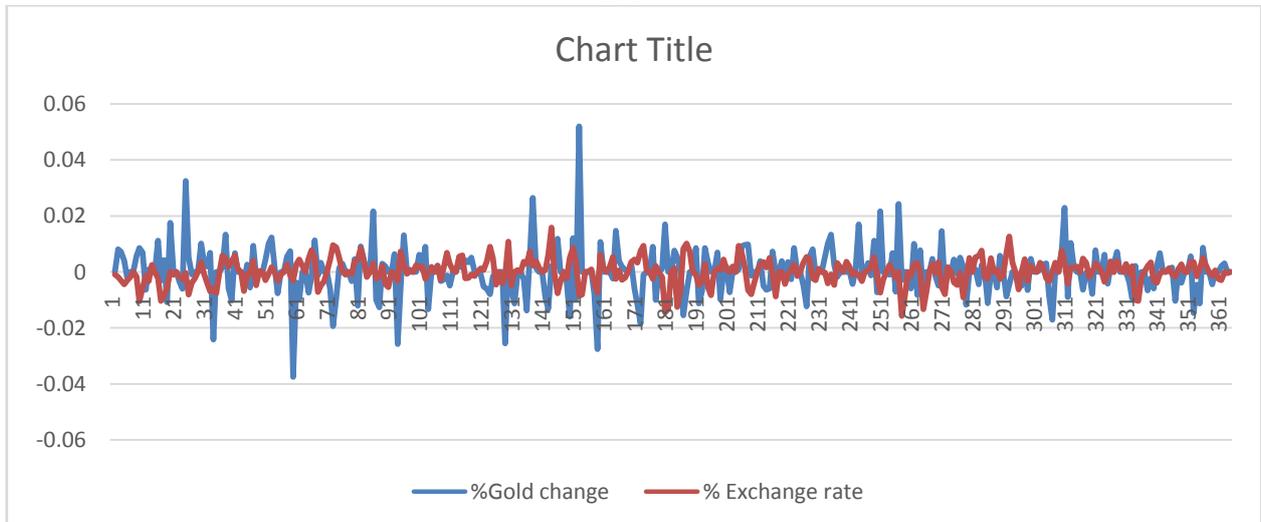


Interpretation:

In the year 2014 the correlation between the Gold price in USD and exchange rate is -0.15824, which is nearest to 1, indicates that there is an inverse relationship between them as

exchange rate fluctuates more than the Gold price in USD. Here the US debt crisis was somewhat resolved, investors then fled the euro in response to a flare-up of the Greece debt crisis.

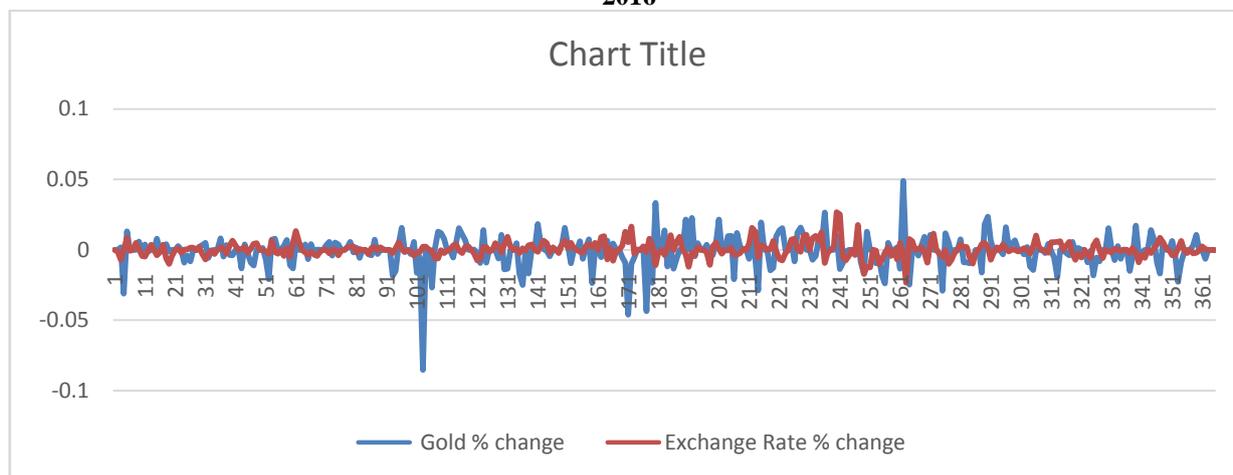
2015:



Interpretation:

In the year 2015, the correlation between Gold price in USD and Exchange rate is -0.05891. During this year there is an inverse

relationship between them as due to change in economic condition and mere improvement after the US debt crisis, with the sudden improvement and rise in USD of Gold price, exchange rate might fall.



Interpretation:

In the year 2016, the correlation is -0.064695613 as due to rapid change in economic condition, the market becomes

B. Correlation and Granger Causality Test

Interpretation: (Yearly basis)

□ Gold Price in INR and USD/INR Exchange Rate

In year 2012, there is a moderate **negative correlation** (-0.51386) between gold price in INR and the Exchange Rate (USD/INR) i.e. while the Gold Price in India has increased the USD/INR exchange rate has decreased in this particular year.

While applying the **Granger causality** test at different lag levels I can infer from the values computed that the Gold price in INR does not Cause Exchange Rate and nor does Exchange Rate Cause Gold Price in INR and i.e. I accept the null hypothesis **In year 2013**, there is low negative **correlation** (-0.03925) between gold price in INR and Exchange Rate (USD/INR) i.e. while Gold Price in India has increased the USD/INR exchange rate has been volatile but has decreased ultimately in the year. (While applying **Granger causality** test at different lag levels I can infer from the values computed that the Gold price in INR does not Cause Exchange Rate and nor does Exchange Rate Cause Gold Price in INR and i.e. I accept the null hypothesis.

In year 2014, there is a high positive **correlation** (0.745451) between gold price in INR and Exchange Rate (USD/INR) i.e. while Gold Price in India has increased the USD/INR exchange rate has also increased. While applying **Granger causality test** at different lag levels I can infer from the values computed that the Gold price in INR does not Cause Exchange Rate but Exchange Rate Causes Gold Price in INR and i.e. I accept the null hypothesis for the first but I am rejecting the null hypothesis for the second. **In year 2015**, there is moderate positive **correlation** (0.520476) between gold price in INR and Exchange Rate (USD/INR) i.e. while Gold Price in India has increased the USD/INR exchange rate has also increased. While applying **Granger causality test** at different lag levels I can infer from the values computed that at a lag of 2 and 6 Gold price in INR does not cause USD/INR exchange rate and also USD/INR exchange rate does not cause Gold price in INR, whereas, at the lag of 4, 8 and 10 Gold price in INR is causing USD/INR exchange rate. **In year 2016**, there is very low negative **correlation** (-0.19278) as the percentage of fluctuations in the price of gold in INR and USD/INR exchange rate is very less in comparison. While applying **Granger Causality Test** at different lag levels I can infer from the values computed that at a lag of 2, 6, 8 and 10 the Gold price in INR is causing USD/INR Exchange Rate while USD/INR Exchange Rate does not cause Gold price in INR. But at a lag of 4 there is a bilateral cause (both causing

each other). **Gold price in USD and USD/INR Exchange Rate:**

In year 2012, there is a high negative **correlation** (-0.73097) between Gold price in USD and the USD/INR exchange rate i.e. as Gold price in USD is increasing the exchange rate USD/INR is decreasing, which means value of dollar is decreasing. While applying **Granger Causality Test** at different lag levels I can infer from the values computed that Gold price in USD is causing USD/INR exchange rate while USD/INR Exchange Rate does not cause Gold Price in USD. I can also infer from this that the F-Statistics (8.53704) is much more significant at a lag of 2. **In year 2013**, there is a very low negative **correlation** (-0.26674) between Gold price in USD and USD/INR exchange rate. The Exchange Rate has been extremely volatile but the % change is low. While applying **Granger Causality Test** at different lag levels I can infer from the values computed that there is a bilateral cause between the both factors. i.e. Gold price in USD is causing USD/INR exchange rate and also USD/INR exchange rate is causing Gold Price in USD. **In year 2014**, there is a moderate positive **correlation** (0.423314) between Gold price in USD and USD/INR exchange rate. i.e. as the gold price in USD has increased the USD/INR exchange rate has also increased. While applying **Granger Causality Test** at different lag levels I can infer from the values computed that at a lag of 4, 8 and 10 Gold price in USD does not cause USD/INR exchange rate while USD/INR Exchange Rate is causing Gold Price in USD. Whereas at a lag of 2 there is a bilateral cause and at a lag of 6 Gold price in USD is causing exchange rate while Exchangerate does not cause Gold price. I can also infer that none of the F-statistics value is significant i.e. I cannot rely blindly on what is causing what. **In year 2015**, there is a moderate negative **correlation** (-0.50635) between Gold price in USD and USD/INR exchange rate. i.e. in year most of the time when gold prices have fallen so has the exchange rate. In this particular year the gold price in USD has been extremely volatile and so has the exchange rate also. While applying **Granger Causality Test** at different lag levels I can infer from the values computed that Gold price in USD is causing USD/INR exchange rate with a high significant level while USD/INR exchange rate does not cause gold price in USD. **In year 2016**, there is a high negative **correlation** (-0.765323334) between Gold Price in USD and USD/INR exchange rate. i.e. I can see that while Gold price in USD has fallen the USD/INR exchange rate has rose. While applying **Granger Causality**

stable and then sudden increase in prices leads to create an inflationary situation which results in increase in Dollar of Gold price and hence decrease in value of exchange rate.

each other). **Gold price in USD and USD/INR Exchange Rate:**

In year 2012, there is a high negative **correlation** (-0.73097) between Gold price in USD and the USD/INR exchange rate i.e. as Gold price in USD is increasing the exchange rate USD/INR is decreasing, which means value of dollar is decreasing. While applying **Granger Causality Test** at different lag levels I can infer from the values computed that Gold price in USD is causing USD/INR exchange rate while USD/INR Exchange Rate does not cause Gold Price in USD. I can also infer from this that the F-Statistics (8.53704) is much more significant at a lag of 2. **In year 2013**, there is a very low negative **correlation** (-0.26674) between Gold price in USD and USD/INR exchange rate. The Exchange Rate has been extremely volatile but the % change is low. While applying **Granger Causality Test** at different lag levels I can infer from the values computed that there is a bilateral cause between the both factors. i.e. Gold price in USD is causing USD/INR exchange rate and also USD/INR exchange rate is causing Gold Price in USD. **In year 2014**, there is a moderate positive **correlation** (0.423314) between Gold price in USD and USD/INR exchange rate. i.e. as the gold price in USD has increased the USD/INR exchange rate has also increased. While applying **Granger Causality Test** at different lag levels I can infer from the values computed that at a lag of 4, 8 and 10 Gold price in USD does not cause USD/INR exchange rate while USD/INR Exchange Rate is causing Gold Price in USD. Whereas at a lag of 2 there is a bilateral cause and at a lag of 6 Gold price in USD is causing exchange rate while Exchangerate does not cause Gold price. I can also infer that none of the F-statistics value is significant i.e. I cannot rely blindly on what is causing what. **In year 2015**, there is a moderate negative **correlation** (-0.50635) between Gold price in USD and USD/INR exchange rate. i.e. in year most of the time when gold prices have fallen so has the exchange rate. In this particular year the gold price in USD has been extremely volatile and so has the exchange rate also. While applying **Granger Causality Test** at different lag levels I can infer from the values computed that Gold price in USD is causing USD/INR exchange rate with a high significant level while USD/INR exchange rate does not cause gold price in USD. **In year 2016**, there is a high negative **correlation** (-0.765323334) between Gold Price in USD and USD/INR exchange rate. i.e. I can see that while Gold price in USD has fallen the USD/INR exchange rate has rose. While applying **Granger Causality**

stable and then sudden increase in prices leads to create an inflationary situation which results in increase in Dollar of Gold price and hence decrease in value of exchange rate.

Test at different lag levels I can infer from the values computed that Gold price in USD is causing USD/INR exchange rate with a high significant level at a lag of 2 while USD/INR exchange rate does not cause gold price in USD.

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