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A DYNAMIC CAUSALITY ANALYSIS BETWEEN THE GOLD PRICE FLUCTUATIONS AND STOCK MARKET PRICES EVIDENCE FROM NEW YORK STOCK EXCHANGE

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Abstract

This study is very significant as the study is carried out with an objective of identifying the type of relationship of gold prices and New York Stock Exchange and to guide the investors on stock exchanges to better understand the gold price impact on their money invested and keep an eye on gold price trends. The study has applied several statistical tools like Augmented Dickey Fuller Test to test Unit Root, Phillips-person test to test Unit Root, VAR lag length selection criteria, Johansen Cointegration Test, Error correction mode, determination of serial correlation, and test of normality to get to a conclusion relating to the type of relationship between gold prices and New York Stock Exchanges. The study has found that the data has no long run relationship and there was a short run relationship between the two variables considered for the study. In addition, the results proved that there is serial correlation and residuals have not been normality distributed. The study recommends investors and policy makers to consider the results to invest their portfolios in stocks or gold prices, it is also advised that investors to go for investments in both the portfolios namely stock prices and gold prices to reduce the risk factor.

Keywords: Gold, New York, Stock Exchange, Investing, Policy Making.

1. Introduction

This study focuses on very important variables such as gold and Stock market indicators that are significant types of investment for the people around the world in the financial market. Gold is a valuable metal presumed as a commodity and it act as a basis of prosperity, an element of worth and medium of exchange. In precise, the gold is holding the walls of the stock market, which protect many investors from risks, arising from counterparts. There is no doubt that stock market plays a significant role for investors and also for the economic development of any country and it is difficult to imagine a world without stock market. Analysis of the shock on the prices of precious commodity such as gold on stock market indices has become an important to understand the causal relationship of the Gold and stock market indices of New York Stock which is one of the largest stock exchanges in the world. In this study, the research scholars have investigated the relationship between the gold prices and the New York Stock exchange indices.

2. Rationale of the Study

Previous studies have proved that stock markets have collapsed in some countries, and one of the reasons behind that was fall is gold trends. This study has covered the gold price impact on New York Stock Exchange for a time span of 20 years from 1999 to 2019. Therefore, it gives a clear picture of the results and accordingly conclude the results achieved properly with enough

supported evidence using several methods to test the short-term and long-term relationship of gold price and New York Stock Exchanges, like Unit root test, Granger Causality and Vector Auto Regression test. This study helps to identify the type of relationship of gold prices and New York Stock Exchange and will hopefully guide the investors of this big Stock Exchange to better understand the gold price impact on their money invested and keep an eye on gold price trends.

3. Statement of Problem

The study would answer the questions like do the gold prices fluctuations have an impact on Stock Exchanges Specifically New York Stock Exchange? Is there a long-term causal relationship between the gold prices and New York Stock Exchanges? Is there a short-term causal relationship between the gold prices and New York Stock Exchanges? Does the data collected in different time series have stationary or not? Do the gold price fluctuations have positive or negative influence on New York Stock Exchange? This study is more significant in general for everyone who is in practice of regular investment portfolios and those who are willing to invest in gold and stock markets. One of the safest among the portfolios is the gold and the investors have to focus the fluctuations in the gold prices that have impact on stock market. This study is apt as the study would be considered by taking into account by analyzing the relationship between gold and stock market indices.

4. Research Gap

Gold is one of the precious minerals that is extracted in limited quantity, which cannot be found easily as compared to other minerals. There are hundreds of researches about the effect of gold price on stock markets around the world, but this study would help the research scholars to find a gap of studies on the impact of gold prices on New York Stock Exchanges. Gold is one variable that has been said to have an influence of stock prices and stock markets around the world according to past studies. New York Stock Exchange is one the biggest and strongest Stock Exchanges in the world. It is necessary to find whether there is a long-term or short-term relationship between gold prices and New York Stock Exchange, and that is to provide guidance to those willing to invest in this huge Stock Exchange.

5. Review of Previous Literature

Significant financial studies have been carried out by the most of the research scholars by considering the very important macro-economic variables like GDP, Old Prices, Exchange rates, and Gold prices and vast literary work has been explored to find the relationship among the each macroeconomic variable. It is also found that there are very little research work carried out around the world to test the relationship between the Gold prices and its influence on the stock exchange indices and this chapter explains some of the research work carried out to find the impact of the gold price fluctuations on the stock exchanges indices. Bhuyan and Dash (2018) have analyzed in a study carried out by considering the monthly data of the gold prices and Indian stock exchange indices with Johansen co-integration test. The study also concluded from the analysis that there is a strong relationship between the two variables taken into account to test the gold prices and stock exchange returns in the long run.

Smith (2001) have carried out an important evaluation from the developed country namely United States of America taking variables for ten years from the American stock exchange to compare the relationship between the gold prices and the stock exchange returns. Initially, they have carried out the stationarity test and they found that the data is non stationary and results at the end showed that there is no relationship between the selected macro-economic variables in the Long run and the study found negative relationship between the variables in the short run. Gayatri and Dhanabhakyam (2014) evaluated the two variables namely stock market returns and the gold prices for the selected period of 2003 to 2013 and the results found that the gold prices and stock market returns differs and fluctuating regularly and there is a requirement to

validate the association among the variables selected for the study. Kumar (2014) has analysed the gold prices and stock returns gives different diversified incentives than the stock investments.

Sumner et al (2010) and Lawrence et al (2003) have explored an important study to understand how the gold price influence the stock market returns and they have concluded that the investments in the form of gold is a safe against the investment in the form of stock market fluctuations. They have underlined that there is not much correlations between the other variables such as financial assets. The less correlation leads them to conclude that the gold is a significant and diversified investment than other investments. Bhunia et al (2013) tested the influence of the data extracted from the Gold prices and stock returns taking into account the data collected for the period of 1991 to 2012 by using familiar econometrics tools namely Augmented Dickey Fuller Test and Phillips Perronunit root test and another most important tool namely Granger test to understand the causal relationship between variables. The authors finally determined that the variables taken for the study using co-integration test demonstrated that there is high presence of the bond between the gold prices and Stock market indices. Wang et al (2011), assessed with few macro economic variables such as gold price, exchange rates of few countries USA, China, Taiwan, Germany, and Japan has resulted that there is a long run relationship among the countries considered for the study other than USA.

6. Research Methodology and Data Analysis

This part of our study spotlight on selected two variables to understand the relationship namely God prices and the New York Stock Exchange Indexes for the period 1999 to 2019. The study aimed at analyzing the causal impact of gold prices on the stock exchange indices during the short run and long run in New York Stock Exchange context. In this study, the data for a time span of 20 years for a period of 1999 to 2019 has been chosen to understand the following: To determine the descriptive statistics, To find the Augmented Dickey Fuller Test to test Unit Root, To find the Philipps-Perron Test to test Unit Root, To identify the VAR lag length selection Criteria, To understand Johansen cointegration Test, To understand error correction model, To find serial correlation and To find the test of normality.

Descriptive Statistics

Table No.1

Statistics	Gold Prices	New York Stock prices
Mean	3.102697	8.992015
Median	2.982140	8.977265
Maximum	4.018723	9.520543
Minimum	1.781709	8.349085
Std. Dev.	0.466148	0.255597
Skewness	0.059045	0.037713
Kurtosis	2.407924	2.124811
Jarque-Bera	76.43853	161.8203

Source: Secondary Data

It is found positive skewness for the gold prices and New York Stock indexes 0.059 and 0.037 respectively. Kurtosis of gold prices is 2.40 and 2.12 for New York Stock indices and positive

kurtosis shows the tails are heavier in the data set. JarqueBera values shows 76.43 for gold prices and 161.82 for New York Stock prices shows that the data do not have a normal distribution.

Unit Root Test -Augmented Dickey – Fuller Test

Table No. 2

Model	ADF Level	ADF 1st Difference	ADF Level	ADF 1st Difference
	Intercept		Trend and Intercept	
	t-Stat (p – Value)	t-Stat (p – Value)	t-Stat (p – Value)	t-Stat (p – Value)
Gold Prices	-1.904344 (0.3306)	-72.89503 (0.0001)***	-1.973414 (0.5161)	-72.89271 (0.0001)***
US stock Prices	-1.181678 (0.6846)	-53.83743 (0.0001)***	-2.587839 (0.2860)	-53.83462 (0.0000)***

Source: Secondary Data

Unit Root Test- Phillips – Perron Test

Table No. 3

Model	PP Level	PP 1st Difference	PP Level	PP 1st Difference
	Intercept		Trend and Intercept	
	t-Stat (p – Value)	t-Stat (p – Value)	t-Stat (p – Value)	t-Stat (p – Value)
Gold Prices	-1.857728 (0.3527)	-72.89703 (0.0001)***	-1.927127 (0.6400)	-72.90154 (0.0001)***
New York Stock Prices	-1.116305 (0.7116)	-75.23336 (0.0001)***	-2.533315 (0.3118)	-75.23058 (0.0001)***

Source: Secondary Data

From the above table Augmented Dickey fuller Test at intercept shows, Gold Prices with the P values (0.001), and New York Stock indices (0.001) which are less that 5% level of significance Hence reject the null hypothesis and accept the alternative hypothesis that there is Stationary or No Unit Root. From the above table of Augmented Dickey Fuller Test at Trend and Intercept shows, Gold Prices with the P values (0.0001) and New York Stock indices (0.0000) which are less than 5% and 10% level significance hence reject the null hypothesis and accept the alternative hypothesis that there is stationary or No unit Root. From the above Phillips-Perron Test at Trend and intercept shows, Gold Prices with the P values (0.0001), and New York Stock indices (0.0001) which are less that 5% and 10% level of significance hence reject the null hypothesis and accept the alternative hypothesis that there is Stationary or No Unit Root.

Johansen Co integration Test

Table No. 4

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.001190	6.843457	15.49471	0.5959
At most 1	0.000170	0.854402	3.841466	0.3553
Trace test indicates no cointegration at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.001190	5.989055	14.26460	0.6146
At most 1	0.000170	0.854402	3.841466	0.3553
Max-eigenvalue test indicates no cointegration at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Secondary Data

Johansen cointegration test shows that there is no relationship between gold prices and stock price index in the long run. According to error correction model, it is concluded that there is short run relationship between gold prices and stock prices.

Error Correlation

Table No. 5

Dependent Variable: STOCK_PRICES				
STOCK_PRICES = C(1)*STOCK_PRICES(-1) + C(2)*STOCK_PRICES(-2) + C(3)*GOLD(-1) + C(4)*GOLD(-2) + C(5)				
	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.954252	0.014399	66.26999	0.0000
C(2)	0.044822	0.014404	3.111873	0.0019
C(3)	-0.010442	0.006374	-1.638188	0.1014
C(4)	0.010245	0.006374	1.607339	0.1080
C(5)	0.009075	0.006402	1.417502	0.1564
R-squared	0.997850	Mean dependent var		8.992112
Adjusted R-squared	0.997849	S.D. dependent var		0.255601
S.E. of regression	0.011856	Akaike info criterion		-6.031009
Sum squared resid	0.706452	Schwarz criterion		-6.024526
Log likelihood	15176.00	Hannan-Quinn criter.		-6.028738
F-statistic	583228.9	Durbin-Watson stat		2.003397
Prob(F-statistic)	0.000000			

Source: Secondary data

From the above table it shows the C(1) coefficient 1 0.954252 and p values are 0.0000, if the C(1) is in negative and p values are less than 5% level of significance then it can be interpreted that there is long run relationship between the variables.

Table No.6

Wald Test: Equation: Untitled			
Test Statistic	Value	df	Probability
F-statistic	1.460235	(2, 5026)	0.2323
Chi-square	2.920471	2	0.2322
Null Hypothesis: C(3)=C(4)=0 Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(3)		-0.010442	0.006374
C(4)		0.010245	0.006374
Restrictions are linear in coefficients.			

Source: Secondary data

From the above table , it is observed that C(3)=C(4)=0 which is null hypothesis, p values as per Chi-square table is 0.2322 which shows more than 5% level of significance and it fails to reject the null hypothesis or accept the null hypothesis. There is short run relationship between the variables taken for the study.

7. Discussion

It is very well known in this world that the gold is valuable metal and it is very popular among all investments. The gold would be one of the important investments for the diversification and gives a pride in the society. The study results would be useful for the investors and decision makers. Integration of gold with the stock market prices is very important to understand and decide. Higher integration refers to the vast opportunities for the investors to decide their portfolios according to their time period. There are various macroeconomic variables in the globe that one variable affect the other or movement of one variable have fluctuations in other variable. It is true that that any change in the one variable cause a change in the related variable. Security market is a place where shares are bought and sold and it plays in an important role in any country and it would have a very big impact if it not properly monitored. The previous literature reviews have given an idea to understand the gap of knowledge in the topic chosen for the study and the relationship has not been studied earlier for the period taken. Researchers have not taken efforts to do the same research in the past with the similar kind of econometric tools.

8. Recommendations

The study is one of the kind of explanatory in nature and it is suggested to carry out the similar kind of studies in other parts of the world. It is suggested to carry out the study in different time period with different historical data in other parts of the world. It is important to understand and study the relationship of the different stock price in the different stock exchanges with the gold prices to have a clear picture on the study considered. It is also important to suggest studying the relationship between different macro-economic variables in the long run and short run. It is suggested for the investors and policy makers to consider the results to invest their portfolios in stocks or gold prices. It is also suggested to the investors to go for investments in both the portfolios namely stock prices and gold prices to reduce the risk factor.

9. Conclusion

The study entitled on A dynamic causality analysis between the gold price fluctuations and stock market index: Evidence from New York Stock Exchange. The researchers have taken twenty years daily data of two variables namely gold prices and stock prices. This study has been carried out with various important statistical and econometric tools like descriptive statistics, Augmented Unit Root Test, Phillips-perron Test, Johansen cointegration test, Vector autoregressive models, Error Correction Model, Breusch-Godfrey Serial Correlation LM Test and Test of Heteroscedasticity. The study has concluded that the data has no long run relationship and there was short run relationship between the two variables considered for the study. Moreover, the results proved that there is serial correlation and residuals have not had normality distributed.

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