

Impact Of Gold Price On Stock Market Return on NSE: An Empirical Analysis

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Abstract

The financial system of a country is an important tool for economic development of the country as it helps in the creation of wealth by linking savings with investments. It facilitates the flow of funds from the households (savers) to business firms (investors) to aid in wealth creation and development of both the parties. In our stock broking industry there are many investors who are investing money in various investment options, but large amount of investment is done in equity market and gold market. This study analyse the impact of gold price variation affect the stock market returns in India. Unit root test indicates that the time series data are not stationary at levels and stationary at 1st difference. Johansen's Co-integration maximum likelihood method is employed to test the long run relationship between gold price and stock market return in India. Vector Error Correction Model (VECM) was employed to describe the dynamic interrelationship among the variables of the model. On the basis of the empirical result gold price is negatively statistically significant for influencing the domestic stock market return.

Keywords: ANR, Gold Price, VECM, ADF, AIC.

Introduction

A sound and healthy financial system is directly related to economic growth and development. Economy cannot grow and improve living standards of its population in the absence of a well- functioning and efficient financial sector development. In the current scenario, the activities of financial markets and

their relationships with the real sector have assumed significant importance. The rise in geopolitical risk, low interest rates, volatility of exchange rate and stock market contribute to shift to gold as an alternative investment and useful hedge.

Gold is considered as a good asset protection

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for most assets. Gold is different from other assets since gold is highly liquid and it responds to price changes (Ranson and Wainwright, 2005). Gold is a favoured choice of investors all across the globe due to its high liquidity and universal acceptance. It can be cashed easily and is accepted as a mode of payment and security world wide. Even though gold is considered to be the best alternatives source of investment. Investors have tendency to switch to gold investment, with other market instruments are too risky. Theoretically there is an inverse relationship between the stock market and gold price. Generally speaking stock market is up when the gold price are down and vice versa. In addition there are two different theories on the relationship between gold demand and income. The classical theory argue that there exist a positive relationship between gold price and real income. While Keynesian theory argues that more demand means more economic backwardness hence low income which indicate an inverse relationship.

As gold is not produced in India, it is imported from other countries like US, South Africa, it increases fiscal deficit, decreasing the power of rupees with respect to dollar or depreciation of Indian rupee. The value of rupee goes down which increases the inflation in the country as the price of other commodities imported like petroleum etc. gets high and due to this the price of vegetables, fruit, electricity etc.

Review of Literature

A considerable economic literature has been devoted to explore the long-term impact of gold prices on macroeconomic variables like inflation, crude oil price, exchange rate, trade deficit, growth rate and monetary policy. However, there is very little research on how

gold price volatility affect the performance of stock market return of emerging economics. In other words, how strong the relation is between gold price and stock price indices.

Gayathri and Dhanabhakym (2014) made an attempt to analyse the impact of gold prices on NSE-Nifty for a period of ten years. The result of the study indicated that there is a long run co-integration relationship between the variables of the model. Furthermore, the study showed a unidirectional causality relationship between Gold prices and NSE-Nifty index. Narang and Singh (2013) aimed at investigating the dynamic relationship between gold prices and stock market returns in India. The empirical result shows that the existence of unidirectional or bidirectional relationship between gold price and Sensex return for the period 2002-2012. Bhuyan and Dash (2018) assessed the dynamic causality relationship between Indian gold price movements and Indian stock market returns by using secondary monthly time series data with Granger Causality and Johansen co-integration test. The empirical result showed that there is a long run relationship between gold price and stock returns in India.

Srivastava and Hari Babu (2016) examined the causal relation of daily prices of gold and stock returns in India and the result shows that there is a long run relationship between the stock market return and gold price, but as per causality relationship model it shows only bidirectional impact of variables.

Bhunia and Mukhuti (2013) examined the impact of the domestic gold price on stock price indices in India for the period for the period from 1991 to 2012. ADF test confirmed that the time series data were not stationary at level but stationary at 1st difference. Granger causality test pointed out that there is no causality exists between Nifty and gold price. Gilmore et al. (2009) described the dynamics

of gold prices, gold mining stock prices and stock market prices co-movements. This study reveals that gold helps to diversify the investors portfolio as it moves inversely with stock. Gold rates are generally rise during the inflationary period as it remains more stable than cash or any other assets.

Afsal and Haque (2016) examined the gold price and stock markets in Saudi Arabia. They mainly pointed out the non-linear dependencies with stock market in the Saudi Arabian perspective by the help of univariate and multivariate models of generalized autoregressive conditional heteroskedasticity (GARCH) analysis. The result shows that there is no dynamic relationship between gold price and stock market. Mukhuti and Bhunia (2013) analyse that gold is popularly considered as a hedge against inflation. It has a direct relationship with inflation. During the period of inflation investor's fear stock and debt funds could under performed. But gold has historically performed well during inflation.

Large number of research works has been carried out the impact of gold price on stock market mainly based on international scenario. A very small number of studies have so far been carried out the relationship between gold and stock market performance in India. Therefore the main aim of this present study is to analyse the impact of positive or negative short and long run relationship between gold price and stock market performance of India.

Research Problem

Gold is an important saving instrument in India and is very often used as a protection against inflation, it is expected that gold may be looked upon as alternative asset for those holding idle money. Even though gold is considered to be the best alternative source of

investment. Investors have tendency to switch to gold investment when other market instruments are too risky. The relationship between gold and equity market are uncertain. The standard view is that these two market are negatively linked. Some studies found that there is no long run relationship between stock market return and gold price in India. Therefore this study is mainly focused on what type of relationship between gold price and stock market return in India.

Objective of the Study

- To analyse the relationship between gold prices and stock market performance in India.
- To investigate the long run and short run impact of gold prices on Indian stock market return represented by NSE-Nifty.

Research Methodology

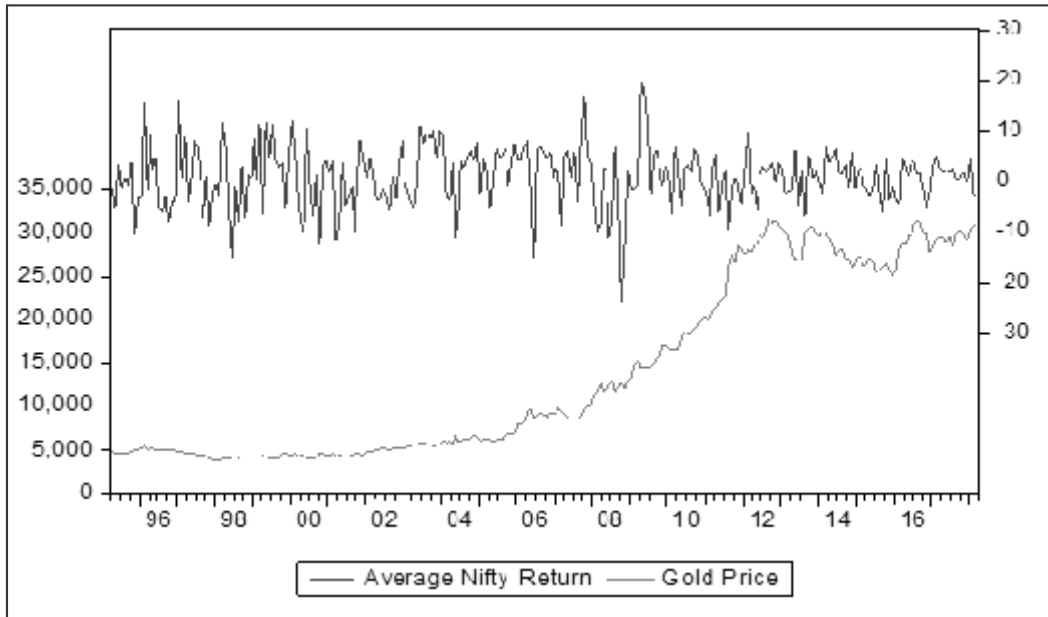
Data Collection

This study is mainly based on secondary data collected from 1995 to 2019. The data related to Nifty return and gold prices are collected from the RBI data base, SEBI Annual Report, Handbook of Statistics of Indian Economy etc.

Data Analysis

The stock market return is taken as dependent variable while volatility in gold price as an independent variable. Correlation analysis can be used for determining the relationship between gold price and stock market return in India. Vector Error Correction Model (VECM) is used for analysing the exact impact of gold price variation on stock market return in India. Augment Dickey Fuller (ADF) is used for testing the stationary properties of the data and Akaike Information criteria (AIC) is

Figure 1: Relationship between Gold Price and Stock Return in India



applied for determining the optimal lag length of the model.

Figure 1 shows the gold price and NSE Nifty return from 1995 to 2019, there was negative correlation or inverse relationship between these two markets. Gold and stock market correlation cannot be established directly. But the historical performance of gold and stock market can understand with the help of Correlation Analysis. The exact impact of gold price on stock return can be analysed with the help of modern econometrics analysis.

Model Specification

$$ANR = f(GP)$$

$$ANR = \beta_0 + \beta_1 (GP) + \epsilon$$

ANR= Average Nifty Return

GP= Gold price

β_0 = Intercept

β_1 = The Coefficient of Independent Variable Gold Price.

ϵ =Error Term

The above empirical analysis shows the relationship between gold price, which is independent variable and Nifty return as the dependent variable in this model.

Unit Root Test

It is necessary to test for stationarity of time series before proceeding the co-integration and long run relationship of the model. The results of both the Augment Dickey Fuller (ADF) test and Phillips Perron (PP) test (refer Table 1) shows that gold price and Nifty return are integrated of order one as the null hypothesis that the series are not stationary is accepted at level but rejected at first difference. In other words, the variables are stationary at first difference or I (1).

Table 1: Unit Root Test Results

Variables	Stationary
NR	I (1)
GP	I (1)

Table 2: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3713.697	NA	3.78e+09	27.72908	27.75588	27.73985
1	-2941.514	1527.078*	12244930*	21.99637*	22.07677*	22.02867*
2	-2940.965	1.078828	12564401	22.02212	22.15612	22.07594
3	-2939.800	2.269038	12833254	22.04328	22.23087	22.11863
4	-2939.222	1.116236	13165601	22.06882	22.31001	22.16569
5	-2938.454	1.472626	13487589	22.09294	22.38772	22.21134
6	-2936.447	3.819677	13690493	22.10781	22.45619	22.24774
7	-2933.914	4.782674	13842317	22.11876	22.52074	22.28021
8	-2933.074	1.573469	14174141	22.14234	22.59792	22.32532

* indicates lag order selected by the criterion
 LR: sequential modified LR test statistic (each test at 5% level)
 FPE: Final prediction error
 AIC: Akaike information criterion
 SC: Schwarz information criterion

VAR Model

The next step is to select the optimum lag length of the model by using VAR model and checking the correlogram of its residuals (to avoid the problem of autocorrelation), the

optimum lag length is selected. Using this method, the results suggest that lag 1 (refer Table 2) is the optimum lag for the model on the basis of Akaike Information Criterion.

The Table 3 explain the Trace Statistic and

Table 3: Johansen Co integration: Gold Price and Nifty Return in India

Trend assumption: Linear deterministic trend
 Series: ANR

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.278133	89.30062	3.841466	0.0000

Trace test indicates 1 cointegrating eqn(s) 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 No. of CE(s)	Eigenvalue	Max Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.278133	89.30062	3.841466	0.0000

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

Maximum-eigenvalue statistic point out one co-integrating equation at five percent level. This infers the existence of a long run relationship between the variables. If variables are co-integrated that leads to there is a long run relationship between gold price and stock market return in India.

VECM:Gold Price in India and Its Linkage with Stock Market Performance

Vector Error Correction Model (VECM) is estimated to analyse the long run causality and short run dynamics of the model. In the presence of co-integration, there always exists a corresponding error-correction representation, captured by the Error-

Correction Term (ECT). The ECT captures the long-run adjustment of co-integration variables. The normalized coefficients of long run relationship is presented in the Table 4 shows that long run effect of gold price is significant impact on the Nifty return. The empirical results indicate that the gold price volatility has significant negative impact on the domestic market performance in India. The signs of normalized co-integrating coefficients are reserved to enable proper interpretation.

The results of error correction have been presented in the Table 5. It shows convergence and evaluates the speed of adjustment towards equilibrium. The main feature of error term C (1) is its capability to correct for any

Table 4: Vector Error Correction Estimates

Vector Error Correction Estimates
Standard errors in () & t - statistics in []

Cointegrating Eq:	CointEq1
ANR (-1)	1.000000
GP (- 1)	4.40E - 06 (4.4E- 05) [0.09922]
C	1.095389

Table 5: Error Correction term Estimates

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.771943	0.075700	-10.19735	0.0000
C(2)	-0.004084	0.061114	-0.066823	0.9467
C(3)	-5.90E-06	0.000595	-0.009920	0.9921
C(4)	0.008756	0.354610	0.024693	0.9803
C(5)	6.570862	7.797639	0.842673	0.3998
C(6)	1.810070	6.295143	0.287534	0.7738
C(7)	0.064614	0.061265	1.054668	0.2920
C(8)	89.45347	36.52725	2.448952	0.0146
Determinant residual covariance		11409101		

disequilibrium that may occur due to shock in the system from time to time. If disequilibrium exists in system then error correction term correct such disequilibrium and provides guidance to variables of the system to come back towards equilibrium. The coefficient of the Error Correction Term (ECT (C1)) of the model is -0.77, this implies that the system corrects its previous period disequilibrium at the speed of approximately 77 percent monthly. In line with a prior expectation, the sign of ECT coefficient is significant and negative, indicating there is a long-run causality from gold price to stock market return in India.

Conclusion

The research paper investigates the relationship between stock market indices and gold price in India. The study used the monthly data of Gold Price and NSE Nifty return. There is a negative correlation between stock returns and gold price from 1995 to 2019. Johansen's co-integration test point out one co-integrating equation at five percent level. This infers the existence of a long run relationship between the variables. The normalized coefficients of long run relationship shows that gold price volatility has significant negative impact on the domestic market performance in India. The sign of ECT coefficient is significant and negative, indicating that there is a long-run causality from gold price to stock market return in India. In short there is a speed of adjustment towards long run equilibrium at the rate of 77 percent monthly.

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