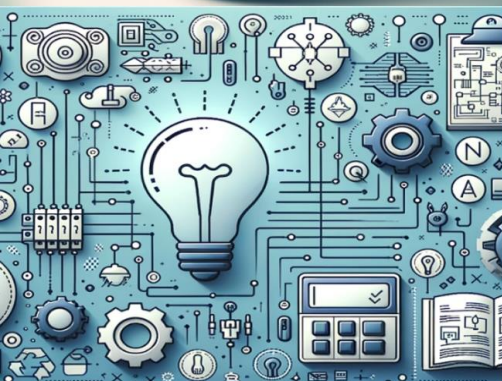# International Journal of Multidisciplinary
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Dynamic Relationship Between Gold Price and Indian Stock Market

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ABSTRACT: This study investigates the complex and dynamic relationship between gold prices and the Indian stock market, influenced by macroeconomic, financial, and geopolitical factors. Gold, a traditional safe-haven asset, is often seen as a hedge against inflation, currency fluctuations, and economic uncertainty. In contrast, the Indian stock market, represented by indices like the S&P BSE Sensex and NSE Nifty, reflects economic growth, corporate earnings, and investor sentiment. Utilizing econometric models such as VAR and GARCH, this study examines the bidirectional causality between gold prices and the Indian stock market over a decade. It also considers the impact of factors like inflation rates, interest rates, and geopolitical events. Findings provide insights for investors, policymakers, and researchers, aiding investment decisions, risk management, and policy formulation. This research contributes to existing literature by offering a framework for analyzing similar relationships in other economies.

I. INTRODUCTION OF THE STUDY

The relationship between gold prices and the Indian stock market has been a subject of significant interest among investors, researchers, and policymakers due to its complexity and dynamic nature. Gold has traditionally been regarded as a safe-haven asset, particularly during times of economic instability, inflation, or geopolitical tensions. Its appeal as a store of value and a hedge against currency fluctuations has made it a popular investment choice during periods of financial uncertainty.

Conversely, the Indian stock market, represented by major indices such as the S&P BSE Sensex and NSE Nifty, reflects the economic growth, corporate earnings, and overall investor sentiment within the country. Driven by factors such as economic liberalization, foreign investment, and demographic changes, the Indian stock market has witnessed substantial growth in recent years. However, this growth has been accompanied by increased volatility, influenced by global events, economic indicators, and corporate performance.

Understanding the dynamic relationship between gold prices and the Indian stock market is essential, as changes in one market can influence the other. For instance, rising gold prices may indicate heightened inflation expectations or economic uncertainty, potentially dampening investor confidence in equities. Conversely, a bullish stock market may reduce the demand for gold as investors seek higher returns.

This study aims to explore the bidirectional causality between gold prices and the Indian stock market, examining how various macroeconomic and geopolitical factors impact this relationship. By employing advanced econometric techniques such as Vector Auto Regression (VAR) and Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models, the study seeks to provide a comprehensive analysis over a 10-year period.

The findings of this study will contribute to the existing literature on the relationship between gold prices and stock markets, offering valuable insights for investors seeking portfolio diversification, policymakers formulating monetary and fiscal policies, and researchers aiming to understand the complexities of financial markets.

II. REVIEW OF LITERATURE

Baur & Lucey (2010)[1], "Gold as a Hedge and Safe Haven" analyzed the role of gold in financial markets and found that it acts as both a hedge and a safe haven during stock market crashes. Their study revealed that gold prices tend to move inversely to stock prices, especially in periods of extreme market volatility, providing stability to investors. They concluded that during financial crises, investors shift their portfolios towards gold to mitigate losses, reinforcing its role as **a** reliable wealth- preserving asset**.**

Mishra et al. (2010)[2], "Inverse Relationship Between Gold Prices and BSE Sensex" investigated the correlation between gold prices and the BSE Sensex and found a strong inverse relationship between them. Their study indicated that when the Sensex declines, investors seek refuge in gold**,** driving its prices higher. They attributed this inverse relationship to risk-averse behavior**,** where market participants shift investments from volatile equities to safer assets. The study also noted that macroeconomic conditions, inflation rates, and interest rate fluctuations strengthen gold's role as a counter-cyclical investment**.**

Kumar & Pandey (2011)[3], "Stock Market Shocks Significantly Impact Gold Prices" explored how sudden stock market shocks influence gold prices and found that gold reacts sharply to stock market turbulence. Using event study methodology, they demonstrated that major market crashes lead to increased gold demand, resulting in price surges**.** The research emphasized that economic uncertainties, such as political instability and financial crises, amplify gold's attractiveness as a hedge against equity losses**.** The findings suggest that gold remains a crucial component in investment portfolios, especially for risk mitigation.

Bhunia (2013)[4], "Gold Provides Effective Diversification Benefits for Indian Investors" emphasized the role of gold in portfolio diversification**,** particularly in the Indian investment landscape. The study found that gold maintains a low correlation with equities**,** meaning it does not move in tandem with stock markets. During economic downturns, when equity markets decline, gold often retains its value, offering stability and risk reduction to investors.

III. STATEMENT OF PROBLEM

There is no conclusive evidence particularly on the relationship between gold price and stock price. It is on the basis of this deficiency that presents a motivation for this study. This study will provide additional evidence as well as seek to fill any existing knowledge gap. The main concern for this study is to determine the link between gold price and stock returns. In this research, study seeks to answer this question that: What is the relationship between gold price and stock market price in India

OBJECTIVES OF THE STUDY

- To investigate the causal relationship between gold price and stock price.
- To investigate the short-term and long-term correlations between gold prices and Indian stock market indices
- To analyze the impact of gold price fluctuations on the Indian stock market, including the effects on returns, volatility, and risk.
- To examine the role of gold as a hedge against Indian stock market volatility and inflation.

IV. LIMITATIONS OF THE STUDY

Research limitation can be defined as the factors or elements which creates restrictions for a researcher in carrying out the studying the desired and best possible manner. Time and resources are considered as the significant limitation of the study. Like any other study, this one is also not without limitation.

- This is totally dependent on secondary data and the sample period is limited to 1st April 2019 - 31st March 2024.
- The study has mainly focused on identifying the relationship between gold price and stock market; thereby it has not considered many other variables constant which can also affect stock market
- On the basis of data research is being carried out by using software, but the every software produce chances of

error with their coefficient and variables. So the result from any software are cannot be said 100% true or accurate.

V. RESEARCH METHODOLOGY

The process used to collect information and data for the purpose of making business decisions. The methodology may include publication research, interviews, surveys and other research techniques, and could include both present and historical information. Research is a careful investigation or inquiry specifically through search for new facts in any branch of knowledge. It is an original contribution to the existing stock of knowledge making for its advancement. Research can simply be defined a task of searching from available data to modify a certain result or theory.

VI. DATA ANALYSIS AND INTERPRETATION

1.SHOWING CLOSING GOLD PRICE
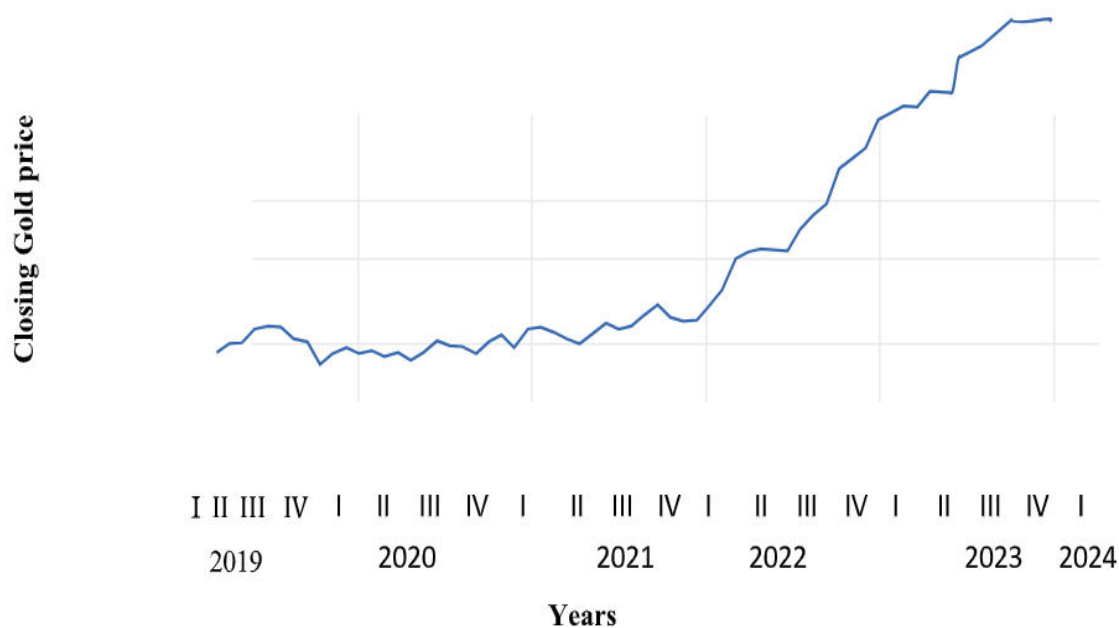
(Source: Secondary data)

INTERPRETATION:
Here on x-axis there are number of years taken and on Y-axis there are closing gold prices per 10/grams. So here we can easily see that the graph is showing upward and downward trend suggesting perhaps that the mean of the series is being changing and gives a clue that the graph is non-stationary.
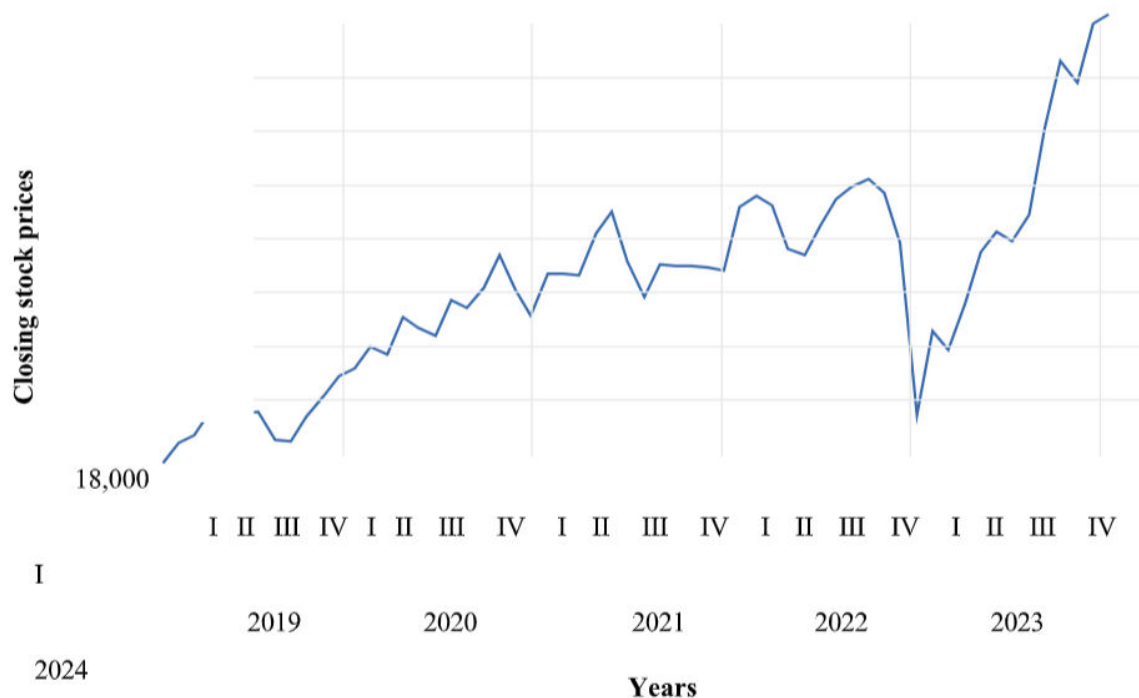
INFERENCE:
The visual inspection of the graph reveals a non-stationary pattern in the gold prices, characterized by upward and downward trends over time, indicating that the mean of the series is not constant, suggesting non-stationarity.

GRAPH NO. 2
SHOWING CLOSING NIFTY PRICE

(Source: Secondary data)

INTERPRETATION:

Here on x – axis there are number of years taken and on Y- axis there are closing stock price of Nifty. So here we can easily see that the graph is showing increasing and decreasing upward and downward trend suggesting perhaps that the mean of the series is being changing and gives a clue that the graph is non – stationary.

INFERENCE:

The fluctuation upward and downward trends in the graph indicate a changing means, suggesting that the Nifty closing stock prices series is non- stationary.

DESCRIPTIVE STATISTICS

Descriptive statistics refers to the process of summarizing and describing the basic features of a dataset, providing an overview of the data's central tendency, variability, and distribution. This involves calculating various statistical measures to understand the characteristics of the data, such as measures of central tendency, including the mean, median, and mode, as well as measures of variability, including the range, variance, and standard deviation. Additionally, descriptive statistics helps to identify patterns and trends in the data, understand the distribution of the data, compare different datasets or groups, and identify outliers and anomalies. By applying descriptive statistics, researchers and analysts can gain a better understanding of their data, identify areas for further investigation, and make informed decisions. Overall, descriptive statistics provides a foundation for data analysis, allowing users to extract meaningful insights from their data and communicate their findings effectively.

SHOWING THE COMBINE DESCRIPTIVE STATISTICS OF BOTH THE VARIABLES

	CLOSING_GOLD_PRICE	CLOSING_STOCK_PRICE
Mean	35142.25	10592.67
Median	31214.25	10737.75
Maximum	52484.00	14690.70
Minimum	27754.29	7849.800
Std. Dev.	7638.335	1557.399
Skewness	1.068723	0.446107
Kurtosis	2.654966	3.201943
Jarque-Bera	11.71931	2.091761
Probability	0.002852	0.351382
Sum	2108535.	635560.1
Sum Sq. Dev.	3.44E+09	1.43E+08
Observations	60	60

INTERPRETATION:

Descriptive statistics of closing price of gold and closing price of stock are presented in the table. These descriptive statistics include mean, median, maximum and minimum value, standard deviation, skewness, kurtosis and Jarque-Bera. Skewness and Kurtosis measure the shape of the probability distribution. Skewness measures the degree of asymmetry, with symmetry implying zero skewness. Here as the skewness for stock price and gold price is positive which indicates the positively skewed stock price and gold price series, relatively long right tail compared to the left tail, so the distribution is nonsymmetric. Kurtosis measured th e flatness or peakness of the distribution of the series; indicates the extent to which probability is concentrated in the center and especially at the tail of the distribution rather than in the shoulders which are the regions between center and the tails.

Every normal distribution has Skewness equal to zero and Kurtosis of 3.So here the skewness of both the variables are positively skewed. Kurtosis in excess of 3 indicates the leptokurtosis. So Here, it can be found that all the figures of closing gold price is 2.65 which means it is Platykurtic curves because its value is less than 3, and closing stock price is Leptokurtic curve because its value is 3.201whichis more than 3. In statistics, the Jarque-Bera the null hypothesis is there, so here closing price of gold the prob. Value is less than 0.05 so then we reject the null hypothesis while closing stock price the prob. Value is more than 0.05 so we cannot null hypothesis and distribution is normal.

INFERENCE:

Gold prices are non-normal with lighter tails (platykurtic), while stock prices are normally distributed with fatter tails (leptokurtic), indicating higher risk of extreme movements in stocks compared to gold.

VII. FINDINGS

1. From the graph point of view it was found that both the variables that is closing gold price and closing stock price both are at non stationarity level that is movement of upward and downward trend is there and the no constant mean return so we can say that the graph is at non stationarity level.
2. From Descriptive statistics we have found that since samples from a normal distribution have an expected skewness of 0 and an expected excess kurtosis of 0 (which is the same as a kurtosis of 3). Jarque-Bera statistics, as based on skewness and kurtosis shows higher value (not zero) which rejects the hypothesis of normal distribution of the series.
3. The correlogram of closing price of stock found to be stationary at 1st level of difference while the correlogram of closing price of gold not found at stationary at 1st level of difference.
4. Further test of Augmented Dicky fuller Test has been done to find out the stationarity of series. So for closing gold price we conducted unit root test first at level with intercept and again with trend and intercept.

5. The same test of Augmented Dicky fuller is being done on closing price of stock in which the series is at non stationary at level with trend and intercept but after differencing at 1st it found out to be at stationary.

6. The regression analysis of both the variables shows that the result from regression calculation shows the Prob. Value is 0.0000 which is less than 0.05 it means regression result are considerable and variable is significant.

7. The correlation results lies between +1 to -1 where +1 is considerable highly positive correlation between variables and -1 is considered as negatively relationship between the variables. Correlation between closing gold price and closing stock price, we get the value of 0.568791 which states that it is highly correlated, though it only gives a overview about the relationship of this variables which indicates the positive correlation between both the variables.

SUGGESTIONS

- Investors should consider gold as a safeguard against stock market volatility
- Portfolio diversification should be done with caution. While gold can provide a hedge against inflation and economic uncertainty, it may not provide a sufficient hedge against stock market volatility.
- The Policymakers should consider the impact of monetary policy on gold and stock prices
- Further research is needed to fully understand the relationships between gold prices, stock prices, and other macroeconomic variables.
- Investors and policymakers should be aware of these limitations and consider other factors when making investment or policy decisions.

VIII. CONCLUSION

The dynamic relationship has been examined between Stock price and gold price. The results of Augmented Dickey-Fuller test conclude that the series are stationary and integrated of order one. There is a positive correlation between and Gold price from March 2019 to April 2024. The results of regression reflected that gold prices had a significant impact on stock market. The objective was also to find out that the relationship between gold price and stock price by using the test like Granger Causality test. The study uses the granger causality test in estimation the significance of factors towards gold price and stock price. From using granger causality it is concluded that overall stock price is not affected by gold price but gold price will affect the stock price significant and so there is unidirectional relationship between gold price and stock price.

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