



A Study on Various Factors Impact on the Gold Price in India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

This study aims to discover the elements that significantly impact gold prices in India. Understanding the leading causes of gold price changes is essential as it has traditionally been a significant financial and cultural symbol in India. The study uses a thorough methodology to examine the evolution of gold prices by combining macroeconomic and market-specific data. The research starts by evaluating the prior research on the variables that impact the price of gold and identifies the essential factors. The study also examines the distinctive elements of the Indian setting, such as regional demand patterns, festival seasons, governmental policies, and import/export rules. The study offers a more complex picture of the Indian gold market by considering essential factors. Understanding the variables affecting gold prices in India can help market participants forecast price changes, help governments create appropriate rules, and help investors make well-informed decisions.

Keywords: *Gold; stock market; economy factors; global economy and exchange rates.*

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1. INTRODUCTION

Gold is a comparatively dense, shiny yellow metal. In terms of corrosion, gold is remarkably resistant to oxygen and a wide range of other chemicals. Gold is a chemical element with the atomic number 79 and the symbol Au. The most malleable and ductile metal known to man is gold, which is dense, soft, and shiny. It represents cultures, memories, wealth, beauty, and tradition. In addition, gold also makes significant advancements in many different technologies. Due to its corrosion resistance, extreme malleability, and ductility, gold is used in nanoparticle technology, medicine, and space exploration. It also acts as the core bonding wire for the iPhone.

Gold has always been an essential part of cultural and religious rites and a symbol of riches. Gold has a special place in the hearts and minds of people all over India. The value and allure of gold have transcended generations, making it a cherished asset and an integral part of Indian households. The country has a long-standing affinity for gold, regarded as a symbol of wealth, prosperity, and a haven investment. India, with its rich cultural heritage and affinity for gold, is one of the largest consumers and importers globally. Various factors, both domestic and international, influence India's gold market. Investors, merchants, and the public have long been fascinated by and alarmed by the erratic price of gold.

This study examines the complex mechanisms that impact the price changes of gold in an Indian setting. It seeks to investigate the range of economic and social elements that influence this precious metal's price in the Indian market. Global trends, domestic economic conditions, inflation, interest rates, currency changes, governmental regulations, the stock market, and consumer attitudes are just a few of the many variables that impact the Indian gold market. In addition, this study will examine the importance of a few elements in affecting gold prices by analyzing historical data, present data, and statistical models. The results of this study will be helpful to traders and investors alike, as well as policymakers and financial institutions. The knowledge collected from this study will advance the conversation about gold as an asset class and its significance to the Indian economy, eventually leading to a more vibrant and open gold market in India.

2. LITERATURE REVIEW

Sailaja, V.N et al. [1] investigate the connection between gold prices and different macroeconomic variables in India, showing significant effects of inflation, GDP, stock market indices, crude oil prices, and foreign exchange rates while finding no significant influence from gold demand and budget deficit, highlighting key factors influencing gold prices in the nation. Pradeep, K.V [2], Gold prices significantly changed when India switched from a regulated to a liberalized economy. The prices started to rise as the markets integrated further. This shift also benefited the jewelry industry due to the importation of essential materials and the introduction of mechanization. Vallabh, P. [3], In addition to addressing regulatory concerns, standardized delivery, trade financing considerations, and obstacles faced by traders, this paper sheds light on the worries and practices of gold merchants in India, providing insightful qualitative information for decision-makers, stakeholders, and researchers.

Chainani, R. (2022) examines 30 variables, including fundamental, macroeconomic, technical, and Intermarket factors, and their effects on COMEX and Indian gold prices. The examination of 36 events identifies key predictors, which offer insightful information for models used to anticipate gold prices. Chiang T (2022) demonstrates how, in various regional markets, gold protects against market volatility, geopolitical risk, and uncertain economic policy. However, in the Indian market, gold also serves as a money substitute. Tanin T. et al. [4] examine the correlation between oil and gold prices during previous crises, revealing a tenuous positive relationship and emphasizing the declining predictive power of oil prices on gold prices, particularly in the context of the COVID-19 pandemic, where gold serves as a safe-haven asset for investors. Choudhary, P. [5] understands the impact of various variables on gold prices; this study examines them. It highlights unexpected results and opposite relationships, particularly regarding India's purchasing power, interest rates, and the lack of correlation with the Sensex and Nifty indexes.

Sharma S et al. (2021) examine the effects of stock market performance, the USD to INR exchange rate, and crude oil prices on gold prices in India. It finds significant results, with a negative association with oil prices and a positive relationship with the stock market, including a

notable error in 2020. Garg, S. [6] remarks on the elements that impact investor behavior when it comes to gold investments. Gold has always been a popular investment choice in India, particularly in the form of jewelry. This study uses factor analysis to investigate the many aspects that influence investor behavior in the context of gold investing. Zhang et al. [7] examine the connection between global oil prices, global gold prices, exchange rates, and stock market indices, revealing the long-term negative impact of oil prices on exchange rates as well as the short-term positive impact of gold prices on exchange rates, with implications for monetary and fiscal policies.

Daga, V. et al. [8] look at how macroeconomic variables affect gold prices in the Indian economy. It finds a weak correlation with crude oil prices and a strong correlation with exchange rates, giving policymakers, analysts, and investors vital information to use when making decisions. Saha, K. (2019) investigates the links between gold prices and macroeconomic factors. The study tackles the absence of prominent empirical trends in this domain and the need for more work following the 2008 financial crisis. The study examines the link between the gold price and the characteristics stated above using daily data from July 2008 to December 2018. Beckmann et al. [9] investigate the relationship between gold prices, bonds, equities, and exchange rates, demonstrating the changing roles of gold as a hedge and safe place throughout the 2008 financial crisis and highlighting the intricate and dynamic interaction between uncertainty assessments and gold price variations.

Shashikala Parimi (2018) determines the factors influencing gold prices in the Indian context in this insightful study, which explores the historical value of gold, increased consumption during economic growth, and the significance of security, liquidity, and portfolio diversification. Sahaida Laily [10] investigates and demonstrates substantial connections between macroeconomic variables and gold prices, showing a positive link with crude oil prices and a negative correlation with GDP, real interest rates, and inflation rates. Exchange rates have no significant impact. Sessaiah, S.V. et al. [11] look at how trade imbalances and budget deficits affect the volatility of crude oil prices and exchange rates and how they affect the price of gold in India. It concludes that while these variables have a small impact on gold prices.

Gopal S. et al. [12] highlight the interaction between key macroeconomic variables and stock market conditions in developing nations like India by demonstrating the significant influence of the gold price, global crude oil price, and US Dollar exchange rate volatility on the Indian stock market. Mohith S et al. [13] use multiple linear regression to analyze the relationship between gold prices and various variables over ten years, revealing significant impacts from crude oil prices, currency rates, and the Nifty 50 and offering helpful academic insights into the driving forces behind gold prices. Bhunia A. et al. [14] examines the relationship between the gold price, exchange rates, and the Sensex in India from 1991 to 2013. It uncovers a long-term relationship and increased investor interest in the stock market with rising gold prices.

Tripathi, L.K [15] finds a relationship between gold prices in India and various global factors examined in this article, and it is discovered that there is a long-term relationship between them. The gold price in India Granger causes the exchange rate (USD) and crude oil price, but global influences do not cause the gold price in India. Chandani, A. [16] provides an overview of significant international research on the factors influencing gold prices, analyzing its trends and movements using data from reliable sources, with a focus on studies conducted in the last ten years and encompassing various parameters and comparisons with financial products like the US dollar and crude oil. Baber, P. (2013), the impact of the global business climate, political environment, market conditions, commodities market integration, consumer behavior, and inflation are all examined in this extensive research study, which sheds light on the historical growth and economic correlations behind India's significant rise in gold prices from 2002 to 2012.

Sindhu R [17] investigates the relationship between gold prices and significant factors, including the USD to INR exchange rate, crude oil prices, repo rate, and inflation rate, revealing an inverse relationship with the US dollar, a connection to repo rates, and a positive correlation with inflation rates. Bhunia A. et al. [18] examines the relationship between domestic gold prices and Indian stock price indices, concluding that during stock market decline and currency depreciation periods, gold prices rise due to strong domestic demand. Singh, P. (2013) studies gold price trends, demand, volatility, and the reasons driving rising gold prices in the

Indian economy. It also offers a comparison of gold trends and patterns in India and China, which provides vital insights into the dynamics of the gold market in both countries.

Sarvaiya, D (2013) compares the performance of ARIMA and LSTM using a 7-year dataset of daily gold prices to determine whether the method is more successful at projecting gold prices using historical data. Mukhuti S. et al. [19] suggest that gold prices in India were influenced by stock market movements and macroeconomic factors, especially during crises, bank failures, currency devaluation, and negative real interest rates. Toraman, C. [20] investigates the variables influencing gold prices, particularly considering the previous financial crisis and the present increase in gold prices [21-26]. The study discovered a high negative link between gold prices and the US exchange rate and a positive association between gold prices and oil prices.

3. METHODOLOGY

3.1 Objectives

- To know the descriptive statistics of the selected variables
- To analyze the correlation between selected variables.
- To examine the selected factors' impact on gold prices in India.

3.2 Hypothesis

Correlation of Coefficient:

H₀: There is no significant relationship between the factors and gold price.

H₁: There is a significant relationship between the factors and gold price.

Multiple Linear Regression:

H₀: There is no significant impact of the factors on the gold price.

H₁: There is a significant impact of the factors on the gold price.

The study is focused on identifying the factors that impact gold prices in India. The study uses secondary data from reliable financial websites, the BSE website, and other relevant resources to analyze the determinants driving gold prices in India, including BSE Sensex, crude oil, inflation, exchange rates, and repo rates. The study encompasses a period of five-year time. The

study used SPSS for descriptive statistics and correlation analysis, while Excel was utilized for regression analysis. Descriptive statistics will offer an overview of the dataset, followed by correlation analysis, determining the correlations between the variables. The predictive ability of the variables will be investigated using Excel regression analysis. The study aims to provide valuable insights for decision-making based on the analysed data.

3.3 Variables

3.3.1 Dependent variable

Gold: Gold prices are the study's dependent variable. Until recently, Gold was a relative benchmark for currency equivalents specific to economic regions or nations throughout recorded history. The price of Gold fluctuates based on a variety of factors. When there is economic instability or international conflict, more individuals desire to buy Gold, which drives the price. The availability of Gold and the level of demand for it both influence its price. As a result, the price of Gold fluctuates like a see-saw due to these several factors.

3.3.2 Independent variables

The various Independent that are assumed to affect the prices of Gold in the short run are as follows:

BSE SENSEX: India's main stock market index is the BSE Sensex, sometimes known as the Sensex. It provides a picture of the performance of the nation's stock market by including the thirty biggest and most actively traded businesses on the Bombay Stock Exchange (BSE). The Sensex serves as an essential benchmark and offers information on the state and outlook of the Indian financial markets. Its different areas of ownership, from banking to technology, impact the index's movement.

Crude Oil Price: The cost of a barrel of conventional crude oil is represented by its spot price. The grade of the oil, which is governed by elements including specific gravity, sulfur content, and extraction site, affects the price. These elements affect its use and quality, affecting its market worth. The state of the global macro economy significantly impacts how much oil is demanded. Oil use is influenced by economic expansion, industrial output, and consumer behavior. In addition, supply

disruptions and geopolitical concerns may cause price changes. The oil price is a significant indicator of economic health and can affect inflation and general market stability due to its importance as a primary energy source.

Inflation: The term "inflation" describes a long-term, steady rise in the prices of goods and services within an economy. Over time, this process causes the value of money to decline, raising prices for both people and businesses. As money can buy fewer goods and services, its purchasing power decreases. Indicators like the Consumer Price Index (CPI) and the Producer Price Index (PPI) are frequently used to assess the effects of inflation. While the PPI looks at price changes at the production level, the CPI analyses the cost of a basket of consumer products.

Exchange Rate (ER): An exchange rate (ER) indicates the relative value of two currencies and establishes the ratio at which they can be exchanged on the foreign exchange market. This crucial statistic directs cross-border trade and finance transactions between companies and people. Interest rates, inflation rates, and economic stability are only a few economic factors that impact exchange rates. Exchange rate dynamics are also influenced by central bank policy and market sentiment. These rates are crucial to international trade because they affect export-import dynamics and national competitiveness.

Repo Rate (Repurchase rate): The repo rate is the interest rate at which the central bank lends money to commercial banks for brief periods, typically to control their liquidity. Lowering the repo rate reduces banks' borrowing costs, encouraging economic activity by making borrowing more accessible to firms and consumers. On the other hand, raising the repo rate might be a tactic to restrain inflation by

increasing the cost of borrowing and reducing excessive expenditure. This instrument is crucial to monetary policy because it enables central banks to control economic expansion and price stability.

4. DATA ANALYSIS

4.1 5 Years Data (2018 – 2022)

The data shows descriptive statistics for six variables: "gold," "BSE Sensex," "crude oil," "inflation," "exchange rate," and "repo rate." The values range from 29644.00 to 53941.00, with an average of 42203.9167 and a standard deviation of 8362.91381. The "inflation" variable fluctuates from 136.40 to 176.70, while the "exchange rate" variable ranges from 63.61 to 82.71. In conclusion, the dataset provides insight on how these variables are statistically distributed. Notably, while the "inflation," "exchange rate," and "repo rate" variables have comparatively lower variability, the "gold," "BSE Sensex," and "crude oil" variables exhibit significant variations as shown by their greater standard deviations (Table 1).

The correlation matrix shows how the different variables relate to one another. Between "gold" and "inflation" (0.909) and "gold" and "exchange rate" (0.827), there are notable, positive connections. The correlation between "inflation" and the "exchange rate" is also very positive (0.878). Additionally, there is a moderate correlation between the "BSE Sensex" and "gold" (0.675), as are "BSE Sensex" and "inflation" (0.884). There is a negative correlation between the "crude oil" variable and "gold" (-0.606), "BSE Sensex" (-0.020), and "inflation" (-0.302). In addition, there is a high negative correlation between "repo rate" and "gold" (-0.765), as well as between "repo rate" and "inflation" (-0.555).

Table 1. Descriptive Statistics of the selected variables for the period of five years

Particulars	N	Minimum	Maximum	Mean	Std. Deviation
Gold	60	29644.00	53941.00	42203.9167	8362.91381
BSE Sensex	60	29486.49	63099.65	44797.56	9821.516
Crude oil	60	1959.30	13248.50	7832.7700	2794.19545
Inflation	60	136.40	176.70	153.9333	12.52325
Exchange rate	60	63.61	82.71	72.8252	4.08388
Repo rate	60	4.00	6.50	5.0517	.95872
Valid N (listwise)	60				

(Source: Author's calculations by using the available data in the different websites)

Table 2. Pearson’s correlation between selected variables for the period of five years (N = 60)

Particulars		Gold	BSE Sensex	Inflation	Exchange rate	Crude oil	Repo rate
Gold	Correlation	1	.675**	.909**	.827**	-.606**	-.765**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
BSE Sensex	Correlation	.675**	1	.884**	.670**	-.020	-.390**
	Sig. (2-tailed)	.000		.000	.000	.878	.002
Inflation	Correlation	.909**	.884**	1	.878**	-.302*	-.555**
	Sig. (2-tailed)	.000	.000		.000	.019	.000
Exchange rate	Correlation	.827**	.670**	.878**	1	-.356**	-.376**
	Sig. (2-tailed)	.000	.000	.000		.005	.003
Crude oil	Correlation	-.606**	-.020	-.302*	-.356**	1	.741**
	Sig. (2-tailed)	.000	.878	.019	.005		.000
Repo rate	Correlation	-.765**	-.390**	-.555**	-.376**	.741**	1
	Sig. (2-tailed)	.000	.002	.000	.003	.000	

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

(Source: Author’s calculations by using the available data in the different websites)

In conclusion, the correlation matrix reveals a number of significant and strong correlations between the variables. Notably, while "crude oil" and "repo rate" stand out for their separate relationships with the other variables, "gold," "BSE Sensex," "inflation," and "exchange rate" are interconnected with one another. Various results provide insight into the connections between various economic indicators.

The regression analysis shows a strong correlation between the dependent variable and the independent variables, with approximately 97.57% of the variance explained by the independent variables. The model's explanatory power remains even after accounting for the number of variables. The model's accuracy is demonstrated by the average prediction error of 0.034011 and the low p-value (0.0000) in the ANOVA table. The coefficients indicate that unit increases in "BSE SENSEX" correspond to a decrease in the dependent variable, while "Inflation" and "Exchange Rate" have limited statistical significance.

The results of the regression analysis show that the model fits well, and that the variables "BSE SENSEX," "Crude Oil," "Inflation," and "Repo" are all very significant in predicting the dependent variable. However, "Exchange Rate's" impact displays a non-significant p-value.

4.2 3 Years Data (2020 – 2022)

The data provides descriptive statistics for various economic indicators over 36 instances. Gold prices ranged from 39,984.00 to 53,941.00, with a moderate deviation of 3,132.65. The BSE Sensex fluctuated between 29,486.49 and 63,099.65, while crude oil prices varied from 1,959.30 to 10,887.97. Inflation rates fluctuated between 148.60 and 176.70, exchange rates ranged from 71.37 to 82.71, and repo rates had limited fluctuations.

As a result, the presented descriptive statistics show how different economic indicators have behaved during the specified time frame. While inflation, currency rates, and the repurchase rate

Table 3. Multiple regression analysis of the dependent variable gold for the period of five years (N = 60)

Particulars	Coefficients	Standard Error	t Stat	P-value	R Square	Adj R Square	F	Sign F
Intercept	1.3492	0.4182	3.225	0.002	0.9757	0.9735	434.1	0.000
SENSEX	-0.2512	0.0627	-4.007	0.000				
Crude Oil	-0.0637	0.0216	-2.943	0.005				
Inflation	2.3465	0.2512	9.339	0.000				
ER	0.2338	0.2238	1.044	0.309				
Repo	-0.0556	0.0104	-5.348	0.000				

(Source: Author’s calculations by using the available data in the different websites)

Table 4. Descriptive Statistics of the selected variables for the period of five years

Particulars	N	Minimum	Maximum	Mean	Std. Deviation
Gold	36	39984.00	53941.00	48513.8333	3132.65244
BSE Sensex	36	29486.49	63099.65	49862.53	9666.509
Crude oil	36	1959.30	10887.97	6319.3519	2434.75026
Inflation	36	148.60	176.70	162.3222	8.59748
Exchange rate	36	71.37	82.71	75.2738	2.78920
Repo rate	36	4.00	6.25	4.4403	.67821
Valid N (listwise)	36				

(Source: Author's calculations by using the available data in the different websites)

showed somewhat more stability, gold, and crude oil prices, as well as the stock market index, showed substantial instability. Understanding the economic environment during the observed period is made easier with the help of these statistics, which provide insights into the trends and volatility of these variables.

The correlation matrix reveals the relationship between gold prices and BSE Sensex have a moderate positive correlation, with a strong positive correlation between gold prices and inflation. Gold prices and exchange rates show some alignment, with a positive correlation of

around 0.625. Gold prices and crude oil prices have a weak positive correlation of around 0.275, suggesting a minor connection. Gold prices and repo rates have a slight relationship. BSE Sensex and inflation have a strong positive correlation, with a robust connection between stock market performance and inflation rates. Inflation and exchange rates have a strong positive correlation, with a strong positive correlation of around 0.779. Exchange rates and crude oil prices have a positive correlation, with a notable relationship between exchange rate fluctuations and changes in the repurchase rate.

Table 5. Pearson's correlation between selected variables for the period of three years (N = 36)

Particulars		Gold	Sensex	Inflation	Exchange	Crude	Repo
Gold	Correlation	1	.446**	.660**	.625**	.275	.158
	Sig. (2-tailed)		.006	.000	.000	.105	.358
BSE Sensex	Correlation	.446**	1	.887**	.504**	.741**	.235
	Sig. (2-tailed)	.006		.000	.002	.000	.167
Inflation	Correlation	.660**	.887**	1	.776**	.779**	.478**
	Sig. (2-tailed)	.000	.000		.000	.000	.003
Exchange rate	Correlation	.625**	.504**	.776**	1	.495**	.749**
	Sig. (2-tailed)	.000	.002	.000		.002	.000
Crude oil	Correlation	.275	.741**	.779**	.495**	1	.477**
	Sig. (2-tailed)	.105	.000	.000	.002		.003
Repo rate	Correlation	.158	.235	.478**	.749**	.477**	1
	Sig. (2-tailed)	.358	.167	.003	.000	.003	

** Correlation is significant at the 0.01 level (2-tailed)

(Source: Author's calculations by using the available data in the different websites)

Table 6. Multiple regression analysis of the dependent variable gold for the period of three years (N = 36)

Particulars	Coefficients	Standard Error	t Stat	P-value	R Square	Adj R Square	F	Sign F
Intercept	1.9868	1.1406	1.741	0.09177	0.7151	0.6676	15.061	0.000
SENSEX	-0.1396	0.0861	-1.622	0.11521				
Crude Oil	-0.0458	0.0322	-1.420	0.16581				
Inflation	1.4836	0.5096	2.911	0.00673				
ER	0.7818	0.5292	1.477	0.15004				
Repo	-0.0498	0.0184	-2.706	0.01110				

(Source: Author's calculations by using the available data in the different websites)

The regression analysis focuses on predicting an outcome variable based on five predictor variables: BSE Sensex, crude oil prices, inflation, exchange rate, and repo rate. Key statistics include multiple correlation coefficients, R square, adjusted R square, standard error, and observations. The analysis of variance (ANOVA) tests the model's significance, with the F-statistic and p-value indicating statistical significance. The coefficients represent the estimated impact of each predictor variable on the outcome variable. The intercept is not statistically significant, while the coefficients for BSE Sensex, crude oil, exchange rate, and repo rate have p-values higher than the conventional significance level. Inflation and repo rates have low p-values, indicating statistical significance.

In results to the regression analysis, both inflation and the repo rate are significant, with inflation having a positive impact and the repo rate having a negative effect. The statistical significance of other indicators, such as the BSE Sensex, crude oil, and exchange rate, is low.

71.5% of the outcome's variability is explained by the model. In general, the important factors in figuring out the variation in the outcome variable are inflation and the repo rate.

4.3 Year (2023)

The data shows a range of economic indicators over 12 observations, including gold prices, BSE Sensex values, crude oil prices, inflation rates, exchange rates, and repo rates. Gold prices range from 47960.00 to 53941.00, with a mean of 50944.0000. BSE Sensex values range from 53018.94 to 63099.65, with an average of 58141.45. Crude oil prices range from 7529.41 to 10887.97, with a mean of 9113.5192. Inflation rates fluctuate between 165.70 and 176.70, with a mean of 172.1500.

In conclusion, this information provides light on the fluctuation and main trends of various economic indicators during the given time frame. The standard deviations provide a sense of how volatile or dispersed the values of each indicator.

Table 7. Descriptive Statistics of the selected variables for the period of one year

Particulars	N	Minimum	Maximum	Mean	Std. Deviation
Gold	12	47960.00	53941.00	50944.0000	1513.76520
BSE Sensex	12	53018.94	63099.65	58141.45	2684.404
Crude oil	12	7529.41	10887.97	9113.5192	957.95583
Inflation	12	165.70	176.70	172.1500	3.94220
Exchange rate	12	74.31	82.71	78.1144	2.85981
repo rate	12	4.00	6.25	4.9625	.87986
Valid N (listwise)	12				

(Source: Author's calculations by using the available data in the different websites)

Table 8. Pearson's correlation between selected variables for the period of one year (N = 12)

Particulars		Gold	BSE Sensex	Inflation	Exchange rate	Crude oil	Repo rate
Gold	Correlation	1	.386	.524	.503	.260	.437
	Sig. (2-tailed)		.216	.081	.096	.414	.156
BSE Sensex	Correlation	.386	1	.472	.651*	-.516	.560
	Sig. (2-tailed)	.216		.121	.022	.086	.058
Inflation	Correlation	.524	.472	1	.947**	.127	.924**
	Sig. (2-tailed)	.081	.121		.000	.694	.000
Exchange rate	Correlation	.503	.651*	.947**	1	-.082	.942**
	Sig. (2-tailed)	.096	.022	.000		.801	.000
Crude oil	Correlation	.260	-.516	.127	-.082	1	-.209
	Sig. (2-tailed)	.414	.086	.694	.801		.514
Repo rate	Correlation	.437	.560	.924**	.942**	-.209	1
	Sig. (2-tailed)	.156	.058	.000	.000	.514	

*. Correlation is significant at the 0.05 level (2-tailed)

** Correlation is significant at the 0.01 level (2-tailed)

(Source: Author's calculations by using the available data in the different websites)

The correlation matrix reveals the relationships between economic indicators such as gold, BSE Sensex, inflation, exchange rate, crude oil, and repo rate. The correlations are calculated using Pearson's correlation coefficient and show a moderate positive correlation between gold and BSE Sensex. The correlations are strong, suggesting a significant relationship between higher inflation rates and fluctuations in exchange rates. Crude oil and inflation have a weak positive correlation, while repo rate and inflation are strongly positively correlated. Repo rate and BSE Sensex are related, though not statistically significant.

Overall, the correlation study between the economic indicators to some interesting correlations. Notably, there are potentially important links in the economic landscape indicated by the substantial positive correlations between inflation and exchange rate as well as between inflation and repo rate.

The regression analysis shows a moderate positive correlation between the dependent variable and the independent variables. The coefficient of determination is 0.597021, indicating that 59.70% of the variance in the dependent variable is explained by the independent variables. The adjusted R Square is 0.261206, indicating reduced predictive power when adjusting for the number of predictors. The standard error is 0.025596, indicating an average deviation from predicted values. The ANOVA table presents the variance analysis, with a regression sum of squares of 0.005824, residual sum of squares of 0.003931, and total sum of squares of 0.009755.

The model explains a moderate amount of variance, but this decreases when accounting for the number of predictors. This means that there may not be a strong or significant association between the dependent variable and the independent factors.

Table 9. Multiple regression analysis of the dependent variable gold for the period of one year (N = 12)

Particulars	Coefficients	Standard Error	t Stat	P-value	R Square	Adj R Square	F	Sign F
Intercept	10.0202	7.8241	1.280	0.2475	0.5970	0.2612	1.7778	0.2514
SENSEX	0.6920	0.3854	1.795	0.1227				
Crude Oil	0.3799	0.2014	1.886	0.1082				
Inflation	-1.2372	2.1177	-0.584	0.5803				
E R	-0.9676	1.2329	-0.784	0.4623				
Repo %	0.0706	0.0542	1.301	0.2408				

(Source: Author's calculations by using the available data in the different websites)

5. RESULTS AND DISCUSSION

Table 10. Gold Pearson's correlation with the selected variables during different research periods

Factors	Relationship with Gold Price		
	5 Years	3 Years	Year
BSE Sensex	Positive	Positive	Negative
Crude oil	Positive	Negative	Negative
Inflation	Positive	Positive	Negative
Exchange rate	Positive	Positive	Negative
Repo rate	Positive	Negative	Negative

(Source: Author's calculations)

Table 11. Impact on Gold by the selected variables during different research periods

Factors	Impact on Gold Price		
	5 Years	3 Years	Year
BSE Sensex	Positive	Negative	Negative
Crude oil	Positive	Negative	Negative
Inflation	Positive	Positive	Negative
Exchange rate	Negative	Negative	Negative
Repo rate	Positive	Positive	Negative

(Source: Author's calculations)

Table 10 and Table 11 summarize the correlation and impact of selected variables on gold prices during different research periods. Over the five-year period, the relationships between selected variables and gold prices vary. There is a mix of positive and negative correlations. BSE Sensex and crude oil prices show positive correlations, indicating that they tend to move in the same direction as gold prices during this period. Inflation and repo rates also have positive correlations with gold prices. Exchange rates exhibit a negative correlation, suggesting an inverse relationship with gold prices. During the three-year period, there is a noticeable shift in the relationships and impacts of selected variables on gold prices. BSE Sensex and crude oil prices, which had positive correlations in the five-year period, now show negative correlations. This suggests a change in their relationships with gold prices. Inflation continues to have a positive correlation with gold prices, indicating a consistent relationship. Exchange rates and repo rates maintain their negative correlations with gold prices.

In the current year, the relationships between the selected variables and gold prices change again. BSE Sensex, crude oil prices, inflation, exchange rates, and repo rates all exhibit negative correlations with gold prices. This suggests that during the current year, these variables tend to have an inverse relationship with gold prices. The most significant changes occur in the current year, where all selected variables have negative correlations with gold prices, indicating a strong inverse relationship. The five-year period has a mix of positive and negative correlations, while the three-year period shows a shift from positive to negative correlations for BSE Sensex and crude oil prices. Inflation continues to have a positive correlation with gold prices across all three periods. Exchange rates and repo rates maintain negative correlations with gold prices consistently.

In summary, the relationships and impacts of the selected variables on gold prices are dynamic and change over time. The current year stands out with negative correlations across all variables, indicating a unique pattern compared to the longer-term trends observed in the five-year and three-year periods. Analysts and investors should consider these shifts in relationships when making assessments about the potential impact of these factors on gold prices.

6. CONCLUSION

This study aimed to explore the various factors that significantly impact the price of gold in India. The research provides important new insights into the complex dynamics of the Indian gold market. First, the study identified key factors influencing gold prices in India, such as variations in the price of crude oil, shifts in the BSE Sensex, exchange rates, inflation trends, and repo rates. These factors showed complex relationships with gold prices, frequently influenced by periods and market circumstances. The apparent correlation between crude oil and gold prices highlighted the close linkages between these two economic commodities. As a result of their common status as safe-haven assets, rising oil prices have constantly been correlated with increasing gold prices.

The performance of the Indian stock market, as measured by the BSE Sensex, showed a complex connection with gold prices. Investors seek safety in safe-haven assets like gold during market instability or downturns, driving up the price of this metal. Exchange rates, how strong or weak the Indian rupee is compared to other major international currencies, have been found to have a substantial impact on gold prices. Gold prices frequently rocketed because import costs increased due to the rupee's decline. It was discovered that there was a strong positive correlation between inflation rates and gold prices. Due to its natural significance as a safeguard against diminishing purchasing power during times of increasing inflation, gold prices increased due to increased demand.

They finally highlighted how fluctuations in the repo rate set by the Reserve Bank of India affect gold prices. As borrowing for investments became more inexpensive due to lower repo rates, a sign of using monetary policy, demand for gold tended to increase, pushing prices higher. In summary, this research offers insight into the several variables affecting gold prices in India. Market participants, investors, governments, and financial institutions must know these facts. With this information, they can create suitable rules, predict price fluctuations more accurately, and make wise investment choices. Additionally, this research adds to the continuing discussion about gold as an asset class and its importance to the Indian economy, which may help India build a more active and open gold market.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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