

## Gold Valuation in India

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A quantitative and explanatory research design is adopted, employing descriptive statistics, correlation analysis, graphical analysis, and simple and multiple regression techniques to analyse both the individual and combined effects of macroeconomic variables on gold prices. The analysis is based on secondary data sourced from reliable national and international databases, including the Reserve Bank of India, the Ministry of Statistics and Programme Implementation, the International Monetary Fund, the World Bank, and the India Bullion and Jewellers Association. The empirical results reveal that global uncertainty and RBI gold reserves exert a strong and statistically significant positive influence on gold valuation in India. Exchange rate movements significantly affect gold prices in isolation, whereas inflation and interest rates exhibit weak, statistically insignificant relationships. The combined regression model confirms that the selected macroeconomic variables collectively explain a substantial proportion of variation in gold prices, indicating the relevance of macroeconomic conditions in shaping gold valuation trends.

**Key Words:** Exchange Rate, GDP, Gold valuation, IMF, RBI

Gold has historically occupied a central position in the Indian economy, not merely as a precious metal but as a symbol of wealth, security, and financial stability. India is among the largest consumers of gold globally, and fluctuations in gold prices have wide-ranging implications for households, investors, financial institutions, and policymakers. Beyond its cultural and traditional significance, gold has evolved into a significant financial asset, widely perceived as a hedge against inflation, currency depreciation, and economic uncertainty. In contemporary financial markets, gold valuation is closely influenced by several macroeconomic variables. Inflation erodes the purchasing power of money, leading investors to seek protection through tangible assets such as gold. Empirical evidence suggests that gold often preserves value during inflationary periods, reinforcing its role as an inflation hedge. Interest rates also play a crucial role in determining gold prices. Since gold is a non-interest-bearing asset, higher interest rates increase the opportunity cost of holding gold, thereby reducing its attractiveness. In contrast, lower interest rates tend to support higher demand for gold.

### Problem Statement

Gold prices in India exhibit considerable volatility influenced by both domestic macroeconomic conditions and global economic developments. However, the extent to which key macroeconomic variables collectively affect gold valuation in India has not been adequately examined using long-term empirical data, underscoring the need for a systematic, integrated analysis.

### Review of Literature

One of the foundational contributions to the gold price literature is by **D. G. Baur and B. M. Lucey** who examined whether gold acts as a hedge or a haven against movements in stock and bond markets. Using international data, the authors found that gold serves as a hedge in normal market conditions and as a safe-haven asset during periods of extreme financial stress. Their findings highlight gold's stabilising role during market turmoil, reinforcing its importance during global crises.

Similarly, **D. G. Baur and T. K. McDermott** extended this analysis by examining gold's performance during major financial crises. The study concluded that gold provides substantial safe-haven benefits, particularly during periods of severe stock market downturns. These studies collectively establish gold's relevance as a defensive

asset, especially in times of heightened uncertainty.

Interest rates influence gold prices primarily through opportunity cost mechanisms. Since gold does not pay interest or dividends, higher interest rates tend to reduce its relative attractiveness to financial instruments. **P. K. Narayan, S. Narayan, and X. Zheng** examined the relationship between gold prices and macroeconomic variables, including interest rates. They found a generally negative association between interest rates and gold prices.

The reviewed literature establishes that multiple macroeconomic factors, including inflation, interest rates, exchange rates, global uncertainty, and central bank actions, influence gold prices. While numerous studies confirm gold's role as a hedge and safe-haven asset, most existing research focuses on developed economies or analyses individual macroeconomic variables in isolation. There is limited empirical evidence that integrates domestic macroeconomic variables, global uncertainty, and central bank gold reserves within a single analytical framework for the Indian economy using long-term data

According to **D. G. Baur and B. M. Lucey**, gold serves as a haven during extreme market downturns, protecting against losses in other asset classes. This theory supports including the World Uncertainty Index (WUI) in the study, as increased uncertainty is expected to raise demand for gold, thereby positively influencing its valuation.

The study's conceptual framework provides a structured basis for explaining the relationship between selected macroeconomic variables and gold valuation in India. It outlines how various domestic and global economic factors influence gold prices through different economic channels such as investor behaviour, purchasing power, opportunity cost, and market sentiment.

In this study, gold valuation in India is treated as the dependent variable, measured as the annual average price of 24-carat gold per 10 grams. Gold prices are assumed to respond to changes in key macroeconomic conditions that affect demand, supply, and investor preferences.

Exchange rate movements play a crucial role in determining domestic gold prices, as gold is internationally priced in U.S. dollars. Depreciation of the Indian rupee increases the cost of gold imports, thereby exerting upward pressure on domestic gold prices. Inflation affects gold valuation by reducing the real value of money, prompting investors to shift towards gold as a store of value. Interest rates influence gold prices through opportunity-cost effects: higher interest rates reduce the attractiveness of holding non-interest-bearing assets such as gold. In comparison, lower interest rates support higher gold demand.

World uncertainty reflects periods of economic, political, or financial instability that influence investor sentiment. During times of heightened uncertainty, investors tend to seek safe-haven assets such as gold, increasing demand and prices. Additionally, RBI's gold reserves reflect institutional demand for gold and signal financial stability and confidence in gold as a reserve asset. Changes in central bank gold holdings may influence gold prices through market expectations and sentiment.

The conceptual framework assumes that these macroeconomic variables may influence gold valuation both individually and collectively. While each variable has a direct impact on gold prices, interactions among variables—such as exchange rate movements during global uncertainty or accommodative monetary policy during inflationary periods.

### Objectives of study

1. To analyse the trend and behaviour of gold prices in India over the selected study period.
2. To assess the impact of the inflation rate (CPI) on gold prices in India.
3. To evaluate the effect of interest rate (repo rate) on gold valuation in India.
4. To examine the role of the Reserve Bank of India's gold reserves in influencing gold valuation in India.
5. To assess the combined impact of selected macroeconomic variables on gold valuation in India.

**Hypothesis of Study**

- **H0:** There is no significant relationship between the inflation rate (CPI) and gold valuation in India.
- **H1:** There is a significant relationship between the inflation rate (CPI) and gold valuation in India.
- **H0:** There is no significant relationship between the Reserve Bank of India’s gold reserves and gold valuation in India.
- **H1:** There is a significant relationship between the Reserve Bank of India’s gold reserves and gold valuation in India.

**Data Analysis**

- *Descriptive Statistics Output (SPSS)*

RBI Gold Reserves

**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Gold (24 Karat) Rate in India (approximate in INR/10gm)	26	4300	117570	30068.12	26482.193
RBI_Gold_Reserve	26	357.75	879.60	548.1835	171.60593
Valid N (listwise)	26				

CPI

**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Gold (24 Karat) Rate in India (approximate in INR/10gm)	26	4300	117570	30068.12	26482.193
Inflation rate, end of period consumer prices (Annual percent change)	26	2.5	12.6	5.908	2.3705
Valid N (listwise)	26				

Repo Rate

**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Gold (24 Karat) Rate in India (approximate in INR/10gm)	26	4300	117570	30068.12	26482.193
Interest rate (Repo Rate)	26	4.00	9.65	6.1696	1.33358
Valid N (listwise)	26				

**Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
Gold (24 Karat) Rate in India (approximate in INR/10gm)	26	4300	117570	30068.12	26482.193
Exchange Rate (1 USD to INR)	26	41.35	88.72	59.4442	15.16913
Valid N (listwise)	26				

• Simple Linear Regression Output

**(a) Exchange Rate and Gold Price**

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.888 <sup>a</sup>	.789	.780	12408.231	.789	89.875	1

**Model Summary<sup>b</sup>**

Model	Change Statistics		Durbin-Watson
	df2	Sig. F Change	
1	24	.000	.485

a. Predictors: (Constant), Exchange Rate (1 USD to INR)  
 b. Dependent Variable: Gold (24 Karat) Rate in India (approximate in INR/10gm)

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	13837522243	1	13837522243	89.875	.000 <sup>b</sup>
	Residual	3695140933	24	153964205.6		
	Total	17532663177	25			

a. Dependent Variable: Gold (24 Karat) Rate in India (approximate in INR/10gm)  
 b. Predictors: (Constant), Exchange Rate (1 USD to INR)

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-62127.040	10024.818		-6.197	.000
	Exchange Rate (1 USD to INR)	1550.952	163.598	.888	9.480	.000

• **Equation:** Gold Price = -62,127.04 + 1,550.95 × Exchange Rate

**(b) Repo Rate and Gold Price**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.188 <sup>a</sup>	.035	-.005	26546.650

a. Predictors: (Constant), Interest rate (Repo Rate)

ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	619272306.1	1	619272306.1	.879	.358 <sup>b</sup>
	Residual	16913390871	24	704724619.6		
	Total	17532663177	25			

a. Dependent Variable: Gold (24 Karat) Rate in India (approximate in INR/10gm)

b. Predictors: (Constant), Interest rate (Repo Rate)

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	53093.655	25108.530		2.115	.045
	Interest rate (Repo Rate)	-3732.087	3981.261	-.188	-.937	.358

a. Dependent Variable: Gold (24 Karat) Rate in India (approximate in INR/10gm)

- Equation: Gold Price = 53,093.66 – 3,732.09 × Repo Rate

**(a) Inflation Rate and Gold Price**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.151 <sup>a</sup>	.023	-.018	26717.762

a. Predictors: (Constant), Inflation rate, end of period consumer prices (Annual percent change)

ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	400532063.6	1	400532063.6	.561	.461 <sup>b</sup>
	Residual	17132131113	24	713838796.4		
	Total	17532663177	25			

a. Dependent Variable: Gold (24 Karat) Rate in India (approximate in INR/10gm)

b. Predictors: (Constant), Inflation rate, end of period consumer prices (Annual percent change)

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	40043.546	14310.949		2.798	.010
	Inflation rate, end of period consumer prices (Annual percent change)	-1688.549	2254.214	-.151	-.749	.461

a. Dependent Variable: Gold (24 Karat) Rate in India (approximate in INR/10gm)

- Equation: Gold Price = 40,043.55 – 1,688.55 × Inflation Rate

**(b) RBI Gold Reserves and Gold Price**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.923 <sup>a</sup>	.851	.845	10416.879

a. Predictors: (Constant), RBI\_Gold\_Reserve

ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14928390155	1	14928390155	137.574	.000 <sup>b</sup>
	Residual	2604273022	24	108511375.9		
	Total	17532663177	25			

a. Dependent Variable: Gold (24 Karat) Rate in India (approximate in INR/10gm)

b. Predictors: (Constant), RBI\_Gold\_Reserve

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-47992.170	6961.698		-6.894	.000
	RBI_Gold_Reserve	142.398	12.140	.923	11.729	.000

- **Equation:** Gold Price = -47,992.17 + 142.40 × RBI Gold Reserves

### Findings:

This section summarizes the significant results derived from the descriptive, correlation, and regression analyses and presents the acceptance or rejection of the research hypotheses formulated for the study.

The analysis indicates a strong upward trend and high volatility in gold prices in India over the study period, highlighting gold's increasing importance as a store of value and a hedge during periods of economic uncertainty.

The inflation rate (CPI) shows a weak and statistically insignificant negative relationship with gold prices. This suggests that inflation does not have a significant direct impact on gold valuation in India during the study period. Accordingly, the null hypothesis (H0) is accepted, and the alternative hypothesis (H1) is rejected.

The relationship between RBI gold reserves and gold valuation is found to be very strong and statistically significant, indicating that increased central bank accumulation of gold positively influences domestic gold prices. Hence, the null hypothesis (H0) is rejected, and the alternative hypothesis (H1) is accepted.

The study's findings provide important insights into the macroeconomic determinants of gold valuation in India and highlight the relative importance of global, institutional, and domestic factors. The results reveal that gold prices in India are not driven by a single macroeconomic variable but by a complex interaction of global uncertainty, exchange rate dynamics, and central bank behaviour.

The strong, statistically significant relationship between global uncertainty and gold valuation supports the Safe-Haven Theory, which posits that investors seek protection in gold during periods of economic and geopolitical instability. This finding is consistent with earlier studies by D. G. Baur and B. M. Lucey [1], which identify gold as a reliable safe-haven asset during times of extreme market stress. In the Indian context, heightened global uncertainty appears to be driving domestic gold prices sharply higher.

The results also indicate a powerful positive influence of RBI gold reserves on gold valuation, highlighting the importance of central bank reserve management theory. The Reserve Bank of India's increased gold accumulation signals long-term confidence in gold as a reserve asset and enhances market sentiment. This finding aligns with observations by the World Gold Council, which emphasises the growing role of central banks in influencing global gold demand and prices.

Exchange rate movements demonstrate a substantial positive impact on gold prices in isolation, confirming the relevance of the Exchange Rate Pass-Through Theory. Depreciation of the Indian rupee increases the cost of gold imports, thereby pushing up domestic gold prices. However, the reduced significance of the exchange rate in the multiple regression model suggests overlapping effects with global uncertainty and central bank actions, indicating that exchange rate movements may act as a transmission channel rather than a dominant independent driver.

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