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IMPACT OF MACROECONOMICS FACTORS ON GOLD PRICE FLUCTUATIONS

Ms. A.S. Marisankari
Student, MBA - IT, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, India.
Prof. Dr. R. Hemavathy
Asst. Professor, MBA - IT, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, India.

ABSTRACT:
Gold prices are influenced by various macroeconomic factors, making it essential to analyze their impact using statistical techniques. This study empirically examines how key economic indicators, specifically the inflation rate, interest rates, exchange rates, contribute to fluctuations in gold prices. Using secondary data from reliable financial sources, the research employs correlation analysis, regression modeling, and time-series forecasting to identify significant relationships and trends. The study aims to determine the extent to which each macroeconomic variable affects gold price volatility and whether these relationships remain consistent across different economic cycles. Additionally, the research explores the short-term and long-term impacts of these factors on gold prices, providing insights into potential predictive models. The findings of this study will help investors, policymakers, and financial analysts understand the macroeconomic dynamics that drive gold price movements, allowing for better decision-making in investment and risk management strategies. The study also compares the impact of these factors in different economic conditions, offering a comprehensive understanding of the global and domestic forces shaping gold price trends.

Keyword:
Gold Price Fluctuations; Macroeconomic Factors; Statistical Analysis; Investment and Risk Management; Time-Series Forecasting.

INTROUCTION

Gold has long been regarded as a valuable asset and a safe-haven investment, especially during economic uncertainties. Its value is influenced by various macroeconomic factors, making it an essential subject of study in financial markets. Unlike other commodities, gold does not derive its value from industrial demand alone; rather, it serves as a store of value, a hedge against economic uncertainty, and a medium of exchange in times of financial distress. As a result, fluctuations in gold prices are not solely driven by supply and demand dynamics but are significantly affected by macroeconomic variables.
The fluctuations in gold prices are influenced by various macroeconomic factors, among which inflation rate, exchange rate, and interest rate play a crucial role. When inflation rises, the value of money decreases, and people prefer investing in gold to protect their wealth. Exchange rate changes also affect gold prices, as a weaker local currency makes gold more expensive. Interest rates play a role too—higher rates make saving in banks more attractive than buying gold, reducing its demand. This project explores how these three factors impact gold price movements. By studying past trends and data, we aim to understand their influence on price changes. The findings will help investors and policymakers make better decisions regarding gold investments.

REVIEW OF LITERATURE

Kulaar and Kaur (2024) analyzed the influence of global crude oil prices, Indian inflation rates, exchange rates, and U.S. gold prices on domestic gold prices in India. Their findings indicated that crude oil prices, inflation, and exchange rates had a significant positive impact on gold prices in India, while U.S. gold prices did not show a significant effect.

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Singh and Kaur (2020) examined the long-term and short-term relationships between gold prices and macroeconomic variables in India, such as the BSE Sensex, wholesale price index (WPI), index of industrial production (IIP), interest rates, exchange rates, and gold reserves. Using data from April 1995 to March 2018, they found significant long-term relationships between gold prices and variables like gold reserves, BSE Sensex, WPI, exchange rate, and IIP, while interest rates were not statistically significant.

Lan et al. (2019) conducted an empirical analysis to explore the relationship between macroeconomic variables and gold prices, focusing on the stock index, crude oil prices, and exchange rates. The study utilized 18 years of annual data from 2001 to 2018. To examine the connection between gold price returns and the selected macroeconomic variables, a regression equation and correlation matrix were employed. The accuracy and normality of the time series data were verified using the Breusch-Godfrey Test. The results indicate that gold price returns have a positive and significant impact on crude oil prices at the 1% significance level, while the KSE-100 index exhibits a negative and significant relationship at the 10% level. Additionally, gold prices and exchange rates are significantly but negatively correlated.

STATEMENT OF THE PROBLEM

Gold is a but its price fluctuates due to inflation rates, interest rates, and exchange rates. Inflation erodes currency value, increasing gold demand, while rising interest rates make interest-bearing assets more attractive, reducing gold's appeal. Exchange rate movements, especially the U.S. dollar's strength, also affect gold prices globally. Despite these known relationships, the extent of their impact on gold price fluctuations requires deeper analysis. This study examines the interplay of inflation, interest rates, and exchange rates on gold prices. Understanding these factors is crucial for investors, policymakers, and analysts navigating financial markets. Using statistical methods like correlation and regression analysis, this research aims to provide empirical insights into how these macroeconomic indicators drive gold price movements, aiding better investment and policy decisions.

OBJECTIVES OF THE STUDY

1. To identify the key economic factors influencing gold price fluctuations.
2. To examine the impact of inflation on gold price variations.
3. To determine the effect of interest rate changes on gold prices.
4. To assess how exchange rate fluctuations influence gold prices.
5. To establish relationships between macroeconomic variables and gold price trends.

CONCEPTUAL FRAMEWORK

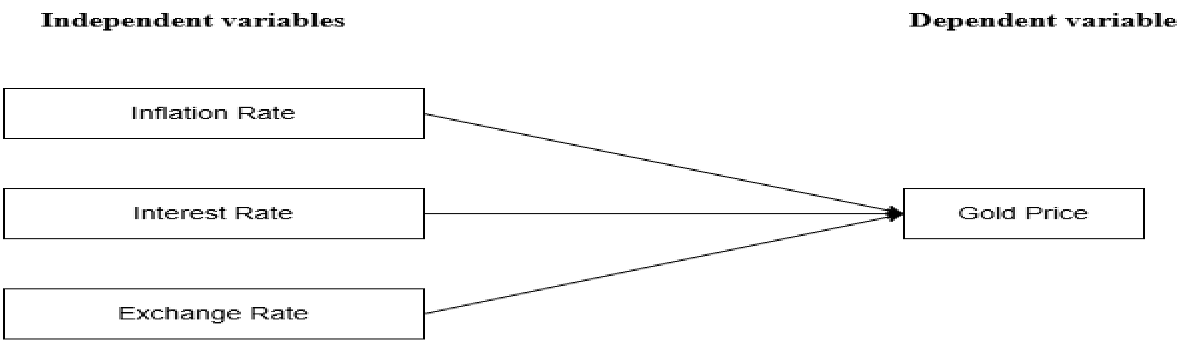

Figure 1

Operational definition

- Macroeconomic Factors – This study considers macroeconomic factors such as the inflation rate, interest rates, and exchange rates as key economic indicators that influence financial markets. These variables are measured using official economic reports and

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financial data sources.

- Gold Price Fluctuations – Gold price fluctuations refer to the changes in gold prices over time, which can be observed in daily, monthly, or annual price movements. These fluctuations are measured using historical gold price data from financial markets.
- Impact Measurement – The relationship between macroeconomic factors and gold price fluctuations is analyzed through statistical techniques, such as regression analysis or correlation analysis, to quantify the extent to which changes in these economic indicators affect gold prices.

RESEARCH METHODOLOGY

This quantitative study uses secondary data to analyze how inflation, exchange rates, and interest rates impact gold price fluctuations. Gold price data is sourced from financial markets, while macroeconomic indicators come from central banks and forex databases. Statistical methods like descriptive analysis, correlation, and regression assess these relationships. The study focuses on global trends within a specific time frame, with limitations including data reliability and external economic factors.

DATA ANALYSIS METHOD

Descriptive Statistics: Descriptive analysis is used to summarize trends, variations, and overall patterns in gold prices, inflation rates, exchange rates, and interest rates. This includes measures such as mean, median, standard deviation, and percentage changes over time.
Correlation Analysis: Correlation analysis examines the strength and direction of relationships between gold prices and macroeconomic factors. It helps determine whether changes in inflation, exchange rates, and interest rates are positively or negatively associated with gold price movements.
Regression Analysis: Regression analysis is applied to quantify the impact of macroeconomic indicators on gold price fluctuations. It identifies the most influential factors and measures the degree to which each variable affects gold prices, helping to establish predictive relationships.

ANALYSIS AND FINDINGS

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Gold_Price_USD_oz	72	1302.95	2076.90	1.6448E3	215.00670
Inflation_Rate	72	.82	7.03	4.2219	1.42400
Interest_Rate	72	2.5100	9.0500	5.343333 E0	1.4673479
Exchange_Rate_USD	72	65.4600	88.5500	7.636264 E1	5.5460523
Valid N (listwise)	72				

Interpretation: This table presents statistical data on gold prices and three key macroeconomic factors: inflation rate, interest rate, and exchange rate. Gold prices ranged from 1302.95 to 2076.90, with an average of 1644.8 and a standard deviation of 215.01, indicating moderate fluctuations. The inflation rate varied between 0.82% and 7.03%, averaging 4.22% with a 1.42% standard deviation. The interest rate ranged from 2.51% to 9.05%, with a mean of 5.34% and a deviation of 1.47%. The exchange rate fluctuated between

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65.46 and 88.55, averaging
76.36 with a standard deviation of 5.55, reflecting moderate variability

Correlations

		Gold_Price_USD_oz	Inflation_Rate	Interest_Rate	Exchange_Rate_USD
Gold_Price_USD_oz	Pearson Correlation	1	.916**	.940**	.894**
	Sig. (2-tailed)		.000	.000	.000
	N	72	72	72	72
Inflation_Rate	Pearson Correlation	.916**	1	.893**	.877**
	Sig. (2-tailed)	.000		.000	.000
	N	72	72	72	72
Interest_Rate	Pearson Correlation	.940**	.893**	1	.891**
	Sig. (2-tailed)	.000	.000		.000
	N	72	72	72	72
Exchange_Rate_USD	Pearson Correlation	.894**	.877**	.891**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	72	72	72	72

Interpretation: This table shows strong positive correlations between gold prices and macroeconomic factors. Gold price and inflation (0.916), interest rate (0.940), and exchange rate (0.894) all have high correlations, indicating that as these factors rise, gold prices tend to increase. Among them, interest rates have the strongest influence.

Additionally, inflation and interest rates (0.893), exchange rates and inflation (0.877), and exchange rates and interest rates (0.891) are also highly correlated, showing their interconnectedness. All correlations are statistically significant ($p = 0.000$), confirming a strong relationship between gold prices and macroeconomic conditions.

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Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	596.507	194.825		3.062	.003
	Inflation_Rate	48.572	12.816	.322	3.790	.000
	Interest_Rate	76.450	13.164	.522	5.808	.000
	Exchange_Rate_USD	5.693	3.265	.147	1.743	.086

Interpretation: This regression table shows the impact of macroeconomic factors on gold prices. The constant (596.507, p = 0.003) represents the base gold price. Inflation (B = 48.572, p = 0.000) and interest rates (B = 76.450, p = 0.000, Beta = 0.522) have a significant positive effect, indicating that higher inflation and interest rates lead to increased gold prices. However, the exchange rate (B = 5.693, p = 0.086) has an insignificant impact (p > 0.05), suggesting it does not strongly influence gold prices in this model. Overall, inflation and interest rates are key drivers of gold price fluctuations.

FINDINGS

Descriptive Statistics

- Gold Price Fluctuations: Gold prices show moderate variation between $1302.95 and $2076.90, with an average of $1644.8 and a standard deviation of $215.01, indicating periodic shifts.
- Macroeconomic Factor Variability: Inflation (0.82% to 7.03%, mean 4.22%), interest rates (2.51% to 9.05%, mean 5.34%), and exchange rates (65.46 to 88.55, mean 76.36) show moderate fluctuations, impacting financial stability.
- Economic Impact: Variations in inflation, interest rates, and exchange rates suggest a strong influence on gold prices, making them key indicators for investors and policymakers.

Correlations

Gold prices show a strong positive correlation with inflation (0.916), interest rates (0.940), and exchange rates (0.894), indicating that increases in these factors drive gold prices higher. Among them, interest rates have the strongest influence.
Additionally, inflation, interest rates, and exchange rates are highly interrelated, affecting each other significantly. All correlations are statistically significant (p = 0.000), confirming their strong impact on gold prices. These findings highlight gold as a key financial indicator that responds sensitively to macroeconomic changes.

Regression Analysis

- Significant Impact of Inflation and Interest Rates – Both inflation (p = 0.000) and interest rates (Beta = 0.522, p = 0.000) have a strong positive effect on gold prices.
- Interest Rate as the Strongest Factor – Among all variables, interest rates have the highest impact on gold price fluctuations.
- Insignificant Influence of Exchange Rate – The exchange rate (p = 0.086) does not

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significantly affect gold prices in this model.

- Macroeconomic Drivers – Inflation and interest rates are the primary determinants of gold price movements.

SUGGESTIONS

Investors and policymakers should closely monitor interest rates, as rising rates significantly impact gold prices. Gold can be used as a hedge against inflation, while policymakers should focus on controlling inflation to ensure financial stability. Diversifying investments beyond gold can help mitigate risks associated with macroeconomic fluctuations. Although the exchange rate's impact on gold prices is minimal, maintaining currency stability is essential to prevent financial volatility. Governments and central banks should implement balanced fiscal and monetary policies to manage inflation and interest rates effectively. Regular market analysis is crucial for making informed financial and economic decisions. These recommendations highlight the importance of macroeconomic monitoring and strategic planning in responding to gold price fluctuations.

CONCLUSION

This study highlights the significant impact of macroeconomic factors on gold price fluctuations. Interest rates and inflation show a strong positive correlation with gold prices, making them key drivers, while exchange rates have a minimal influence. The findings emphasize the importance of monitoring economic indicators for investment and policy decisions. Investors can use gold as a hedge against inflation, while policymakers should focus on stabilizing interest rates and inflation to ensure economic stability. Regular market analysis and balanced macroeconomic policies are essential for navigating financial uncertainties.
Overall, gold remains a crucial asset influenced by economic conditions, reinforcing its role as a safe-haven investment.

REFERENCE

Kulaar, P., & Kaur, R. (2024). Analysing the imp
act of macroeconomic factors on gold prices in India. International Journal of Commerce and Management Research, 5(2), 29–33.

Singh, A., & Kaur, M. (2020). Macroeconomic determinants of gold prices: A bounds testing approach. Indian Journal of Finance, 14(4), 7–21.

Lan, X., Zhang, Y., & Chen, L. (2019). Empirical analysis of the relationship between macroeconomic variables and gold prices: Focusing on stock index, crude oil prices, and exchange rates. International Journal of Recent Technology and Engineering, 8(1S4), 419–42