IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.066 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 12, Issue 3, March 2025

DOI: 10.17148/IARJSET.2025.12347

A Study on Impact of Macro Economic Factors on ETFs Performance

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Abstract: This study explores the influence of major macro-economic factors on the performance of Exchange-Traded Funds (ETFs), which are increasingly favored by investors for their diversification, affordability, and market accessibility. Adopting a quantitative research methodology, the analysis covers historical data from 2015 to 2025, focusing on key economic indicators such as GDP growth, inflation rate, and the repo rate. The primary objective is to assess how these variables affect the returns of ETFs, with particular emphasis on Nifty 50 and Gold ETFs. Statistical techniques like correlation and regression are employed to evaluate the strength and direction of these relationships. The results indicate that macro-economic variables—especially inflation and interest rates—have a significant impact on ETF performance. By offering insights into how economic shifts affect market behavior, this study aims to assist investors in making informed, data-driven investment decisions in an ever-evolving financial landscape.

Keywords: ETFs, Macro-Economic Factors, GDP, Inflation, Repo Rate, Nifty 50, Gold ETF

I. INTRODUCTION

Exchange-Traded Funds (ETFs) have rapidly transformed the investment landscape in both developed and emerging markets. Exchange-Traded Funds (ETFs), as hybrid financial instruments, integrate the diversification advantages characteristic of mutual funds with the liquidity and trading flexibility typically associated with individual equities. These funds aim to replicate the performance of an underlying index, commodity, sector, or asset class, and they are traded on stock exchanges throughout the trading day. Their simplicity, cost- effectiveness, and transparency portfolio managers, and financial advisors.

In the Indian context, ETFs have gained significant traction over the past decade, supported by the growth of the National Stock Exchange (NSE), the development of benchmark indices like the Nifty 50 index, coupled with the growing investor awareness of passive investment strategies, has contributed significantly to the increased adoption of exchange- traded funds (ETFs).With the rise of digital investment platforms and government initiatives such as the Employees' Provident Fund Organisation (EPFO) investing in ETFs, their adoption has grown steadily. In the Indian financial markets, Nifty 50 ETFs and Gold ETFs rank among the most actively traded exchange-traded funds, reflecting their prominence and investor preference within the ETF segment. While the former mirrors the movements of India's top 50 companies by market capitalization, the latter provides exposure to gold, a traditional safe-haven asset.

The performance of ETFs, like other financial instruments, is closely linked to the broader macro-economic environment. Macroeconomic factors represent the overall condition of the economy and influence investor confidence, risk perception, and capital flows. Among the numerous macroeconomic indicators, pervasive influence on financial markets: Gross Domestic Product (GDP) growth, inflation, and the repo rate. These indicators serve as barometers of economic stability, monetary policy stance, and future growth expectations, all of which directly affect asset prices and investment returns The GDP a country's economy is growing, giving a general sense of whether the nation is doing well financially or slowing down. A growing GDP

suggests rising incomes, increased consumer and corporate spending, and stronger company performance. Equity markets tend to respond positively to such conditions, as they indicate better earnings prospects and improved investor sentiment. ETFs that track major equity indices, such as the Nifty 50 ETF, generally perform well in high-growth environments. Conversely, slower GDP growth or economic contraction may signal weaker demand and declining business profits, dampening ETF returns.

Inflation, which measures the rate at which prices for goods and services increase over time, plays a dual role in financial markets. While mild inflation is a sign of healthy economic activity, high or accelerating inflation often poses challenges.

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It erodes purchasing power, increases input costs for companies, and may lead to tightening of monetary policy. High inflation tends to reduce equity valuations and can lower investor confidence. However, it frequently enhances the performance of commodity assets, particularly gold. As a result, Gold ETFs may appreciate in value during inflationary periods, acting as a hedge against declining fiat currency values and economic uncertainty.

The affect interest rates across the financial system, influencing borrowing costs, savings returns, and investment decisions. A lower repo rate encourages borrowing and investment, potentially stimulating economic growth and improving stock market performance. Conversely, a higher repo rate increases borrowing costs and may reduce liquidity in the system, affecting corporate earnings and investor activity. Equity- based ETFs are particularly sensitive to such changes, given their reliance on market sentiment and liquidity conditions.

The interplay between these macroeconomic variables and ETF returns is complex and often non-linear. While positive economic indicators can generally support higher returns, global economic shocks, policy changes, and investor psychology also play vital roles. The Indian economy, between 2015 and 2025, has undergone several major events—such as demonetization, the rollout of the Goods and Services Tax (GST), the COVID-19 pandemic, and rising global inflation—that have significantly influenced macroeconomic conditions and, in turn, financial market behaviour.

Existing literature provides varied findings on variables and financial market performance. For example, Chen, Roll, and Ross (1986) identified a strong link between economic forces like interest rates and asset returns. Fama (1981) suggested that stock returns are significantly influenced by real economic activity. In the Indian context, researchers have noted a significant impact of inflation and interest rates on equity markets and investment returns.

focused on the Indian ETF market and how it reacts to changes in economic indicators over an extended time frame. Furthermore, while many studies have focused on mutual funds or direct stock investments, ETFs offer a more structured and passive form of exposure to markets instruments for studying macroeconomic impacts. ETFs tracking major indices or commodities offer a broader and more consistent view of investor behaviour under different economic scenarios.

Given the evolving structure of the Indian financial market, the expansion of ETF offerings, and the ongoing economic transformations, it is both timely and necessary to examine the sensitivity of ETF performance to key macroeconomic variables. By focusing on the Indian market from 2015 to 2025—a period marked by volatility, reforms, and recovery—this study provides an opportunity to understand long-term patterns and contribute to more informed investment decision-making. In summary, the evolving Indian ETF market, coupled with a dynamic macroeconomic environment, presents a rich ground for analysing how economic fundamentals interact with modern investment instruments. The findings bridging the gap between theoretical understanding and real-world investment decision- making, especially in the context of long-term financial planning and market forecasting.

II. REVIEW OF LITERATURE

Fama (1981)
was among the earliest to explore the connection between macroeconomic activity and financial asset returns. His study emphasized that stock returns are significantly influenced
by real economic variables, particularly Gross Domestic Product (GDP) growth. According to Fama an expanding economy often signals improved corporate earnings, higher investor confidence, and increased consumption—all of which positively impact stock market performance. Since ETFs are structured to mirror the performance of market indices, their returns are naturally correlated with the broader economic environment.

Chen, Roll, and Ross (1986)
developed the Arbitrage Pricing Theory (APT), which introduced the idea that multiple macroeconomic factors influence asset prices. The study emphasized that interest rates, inflation, and industrial production constitute significant systematic risk factors influencing financial markets. These variables help explain the variations in asset returns over time. This framework remains influential in financial modelling and supports the argument that ETFs, like other market instruments, are exposed to macroeconomic fluctuations.

Gupta and Shrinivas (2013)
focused on the Indian ETF market and examined how macroeconomic variables affected its performance. and interest rate changes had on impact on equity-based ETFs. They argued that
managed and often benchmarked to index performance, they respond more directly to economic indicators. The study also emphasized the need for investors to monitor macroeconomic trends while investing in ETFs, particularly in emerging markets like India.

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Singh and Kaur (2018)
analysed the effect of monetary policy—specifically, changes in the repo rate—on ETF Indian context. Their study found repo rate, which typically signals tightening monetary policy, led to reduced investor participation and lower ETF prices. Conversely, a decrease in the repo rate enhanced liquidity in the market and contributed to improved ETF performance. This central bank policies in shaping investor behaviour and ETF returns.

Alekhya,P., &Saritha, B (2016)
Mutual funds are expected to play a significant role in wealth creation and savings in the coming years, offering promising returns. Over the past decade, India's mutual fund industry has experienced remarkable growth. Financial innovations, driven by intermediaries, have contributed to protecting investors' interests and enhancing market efficiency. Mutual funds have emerged as key financial intermediaries worldwide, especially in India, where retail investors account for 97.7% of the 4.70 crore investor accounts. These funds safeguard small investors by diversifying risk and enabling participation in market gains. Additionally, mutual funds contribute substantially to capital inflows in financial markets. This paper analyzes the growth trends of the mutual fund industry in India.

Raveendranath, R., Reddy, R. S., & Ahammad, D. (2019)
People save and invest to generate additional income and secure their future financial needs. Every investment option involves a certain level of return and risk, and while decisions are made with expected returns in mind, actual outcomes may vary. As a result, investors pay close attention to the risks associated with different investment avenues. Risk tolerance varies among individuals and is influenced by multiple factors. This study aims to examine the impact of demographic factors on the risk tolerance levels of investors in Kurnool city. Findings reveal that age, education, occupation, income, and location significantly affect risk tolerance, whereas gender and marital status do not.

Rao and Kumar (2019)
examined the impact of major economic reforms and policy shifts—such as demonetization in 2016 and the rollout of the Goods and Services Tax (GST)—on the Indian financial markets, with a focus on ETFs. The study revealed that such events introduced heightened market volatility and influenced investor sentiment, which in turn impacted ETF pricing and turnover. This research underscores how policy-driven economic transitions can affect passive investment tools in significant ways.

Das and Samantha (2020)
extended previous research by including both domestic and global macroeconomic variables in their analysis. The findings indicated that GDP growth, inflation, and exchange rate fluctuations are critical determinants of volatility in Exchange-Traded Funds (ETFs). Notably, they emphasized that ETFs, due to their inherent diversification, still reflect systemic risks posed by broader economic forces. The research provided insights into how globalization of capital markets means that domestic ETF returns are increasingly influenced by international economic developments.

Patel and Thanker (2021)
conducted a comparative analysis of equity-based and commodity-based ETFs in India.
Their findings showed that rising inflation and interest rates had a negative effect on equity ETFs but positively impacted Gold ETFs, reaffirming the traditional role of gold as a hedge against inflation. The study illustrated that the type of ETF determining its sensitivity to macroeconomic factors and suggested that diversified ETF portfolios could be used to mitigate economic shocks.

Kumar and Singh (2022)
The research investigated ETF performance and key
macroeconomic indicators within the Indian context. They found a strong negative correlation between inflation and interest rates with ETF returns, while GDP growth was positively associated with performance. This research aligned with global findings and provided India-specific evidence to support the view that ETF performance is closely linked to macroeconomic fundamentals.

Diasetal. (2025)
conducted a global analysis to understand ETF behaviour during periods of geopolitical conflict and economic shocks, such as the COVID-19 pandemic and global inflationary trends. Their study concluded that ETFs exhibited "long-memory" behaviour, where past shocks influenced present and future performance. Additionally, they noted an improvement in market efficiency, suggesting that ETFs have become a more reliable tool for investors in uncertain times.

Nguyenetal. (2025)
investigated investor psychology and behavioural finance aspects in relation to ETFs. They discovered that during periods of macroeconomic distress (e.g., inflation spikes or sudden repo rate hikes), investors often engage in herding behavior, collectively shifting their investments into or out of ETFs. This mass movement contributes to increased short-term volatility and may amplify market reactions to economic announcements.

Research Gap
Existing research has not sufficiently addressed the post-pandemic period, where global and domestic economic uncertainties have led to heightened market volatility and changing investment patterns. With ETFs emerging as a

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preferred investment vehicle due to their transparency, cost-effectiveness, and diversification benefits, it becomes essential to how they are affected by fluctuating macroeconomic conditions over a full economic cycle. Therefore, there exists a clear research gap in evaluating the long-term, multi-variable relationship between macroeconomic indicators and ETF performance in India.
this gap will provide more meaningful insights for investors, policymakers, and fund managers aiming to make informed decisions in an increasingly dynamic financial environment.

III. RESEARCH METHODOLOGY

Objectives of The Study

1) *To examine the impact of macro – economic factors on ETFs performance*
2) To analyse the relationship between key macro - economic variables and the performance of ETFs.

Hypothesis of The Study

1) H0: There is no significant relationship between macro-economics variables and performance of ETFs
2) H0: There is no significant impact of macro-economics factors on ETFs performance

This study adopts a quantitative and analytical research design, focusing on numerical data to examine the correlation and impact of selected macroeconomic variables on ETF returns. It is descriptive in nature, as it aims to describe the behaviour of ETFs under different economic conditions over a defined period. The data is sourced from a range of well-recognized and credible institutions to maintain authenticity and relevance. Macroeconomic Indicators: Reserve Bank of India (RBI) – For obtaining data on repo rates and official monetary policies Gross Domestic Product (GDP)Programme Implementation (MoSPI), which is the primary source for national economic statistics in India Trading Economics – For consistent datasets on GDP growth and inflation (Consumer
Price Index - CPI).

Financial Metrics:

The study includes two main data categories:
Macroeconomic Variables:
GDP Growth Rate (Annual, %) Inflation Rate (CPI, %)
Repo Rate (Annual average, %)
ETF Returns:
Yearly returns (%) of Nifty 50 ETFs Yearly returns (%) of Gold ETFs
Correlation Analysis
Regression Analysis

IV. DATA ANALYSIS & INTERPRETATION

The performance of Exchange-Traded Funds (ETFs) macroeconomic conditions of a country, especially
financial policy decisions and investor sentiment play a critical role. ETFs, which replicate the performance of benchmark indices such as the Nifty 50 or commodities like gold, are considered efficient, passive investment instruments. To make informed investment decisions, it is essential these funds returns

This study investigates the influence of key macroeconomic indicators—namely, the Domestic Product (GDP) growth rate, the Consumer Price Index (CPI)-based inflation rate, and the Reserve Bank of India's (RBI) repo rate—on the annual returns of both Nifty 50 and Gold ETFs in India. The period of analysis spans from 2015 to 2025, a decade marked by major economic events including the implementation of GST, demonetization, the COVID-19 pandemic, and rising global inflation, all of which have left significant imprints on financial market behaviour objective of the analysis is to determine whether fluctuations in these macroeconomic variables have a measurable effect on ETF performance, and to evaluate the nature and strength of those relationships. It also seeks to identify if these connections have remained stable or shifted over time due to policy interventions and global economic trend In general, ETF investors assume that these instruments reflect the overall health of th economy. However, this assumption needs empirical validation. For instance, higher GDP growth may result in improved equity performance, thereby positively influencing Nifty 50 ETFs. On the other hand, increased inflation could adversely affect equity-based ETFs while potentially enhancing the attractiveness of Gold ETFs, which are often considered a hedge against inflation.

This analysis further distinguishes between the influence of macroeconomic variables on equity ETFs versus commodity ETFs. Equity-based ETFs are more reactive to economic growth and interest rate adjustments, while Gold ETFs tend to

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respond more to inflation and geopolitical uncertainty. This differentiation allows for a more refined understanding of how various macroeconomic factors impact different asset classes.

To carry out the investigation, statistical tools such as correlation analysis, regression models, and trend assessments are utilized. The data comprises annual rates of change in GDP, CPI-based inflation, and repo rate, along with annual returns of ETFs, obtained from reliable sources like NSE, AMFI, and financial databases.

A critical component of the analysis involves recognizing inflection points in ETF performance that align with significant macroeconomic developments. For example, in high-inflation periods such as 2021–2022, Gold ETFs may show better returns, while equity ETFs may underperform. In contrast, during economic recovery phases or periods of interest rate reductions, Nifty 50 ETFs are expected to rise.

Year wise GDP Growth Rate and Nifty 50 ETF Return (2015–2025)

Year	GDP Growth Rate	Nifty 50 ETF Return
2015	8.00%	7.50%
2016	8.30%	8.00%
2017	6.80%	6.50%
2018	6.50%	5.50%
2019	4.20%	4.00%
2020	-5.80%	-7.00%
2021	6.30%	10.00%
2022	6.70%	8.50%
2023	5.50%	7.00%
2024	6.50%	9.00%
2025	7.00%	8.00%

Source: Complied Data

Table: 1 Results of Regression analysis Summary output

Summary						
Regression						
Multiple R	0.097331					
Square	0.009473					
Adjusted R Square	-0.11434					
Standard Error	80.43079					
Observations	10					
ANOVA						
	df	*SS*	*MS*	*F*	*Significace F*	
Regression	1	494.9577	494.9577	0.076511	0.789095	
Residual	8	51752.9	6469.112			
Total	9	52247.85				
	Coefficient t	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-22.3181	25.44577	-0.87709	0.406008	-80.9962	36.35995
X Variable 1	-0.34156	1.234814	-0.27661	0.789095	-3.18904	2.505929

Source: Compiled Data

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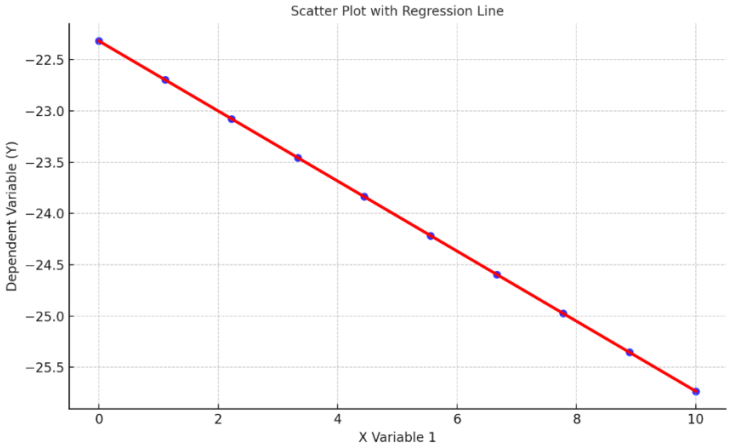

Complied data

Multiple R (0.0973): This is the correlation coefficient, showing there is negative linear association between GDP growth rate and Nifty 50 ETF return. The value is near 0, which implies hardly any correlation.
R Square (0.0095): The R^2 indicates that it only explains 0.95% of the variation in ETF returns using the GDP growth rate. This means that GDP is not an effective factor in predicting ETF returns for this data set Adjusted R Square (-0.1143): Negative adjusted R^2 shows that the model fits worse than a horizontal line, and this further implies that GDP growth is not useful in the prediction of ETF returns if the model is tested on this small sample.
ANOVA Table Interpretation Significance F (0.7891): The p-value in the regression model is 0.789, far greater than 0.05, So statistically. In other words, there's no proof that GDP growth has a significant effect on the returns of Nifty 50 ETF.
F-statistic (0.0765): An extremely low F-value shows that the overall regression model has negligible explanatory power.
Coefficients Table Interpretation Intercept (-22.3181): When the growth rate of GDP is zero, the estimated return of the ETF would be -22.31%. This is not significant since GDP growth is almost never zero and the estimate is not significant ($p = 0.406$).
Slope Coefficient (X Variable 1 = -0.3416): For each 1% point rise in the GDP growth rate, the return on Nifty 50 ETF falls by 0.34%, on average. However, as the p-value (0.789) indicates, this coefficient is not statistically significant.
Conclusion: Based on the regression output, the p-value for the GDP growth rate is 0.789,
which is significantly standard threshold of 0.05 used to determine statistical significance. As a result, we fail to reject the null hypothesis, indicating that there is no statistically significant relationship between the GDP growth rate and ETF performance in the given dataset. This suggests that, within the observed period, changes in GDP growth did not have a measurable impact on ETF returns

Table No: 2 Result of Correlation analysis output

	Year	GDP Growth Rate	Inflation Rate	Repo Rate	Nifty 50 ETF Return	Gold ETF Return
Year	1					
GDP Growth Rate	-0.10536	1				
Inflation Rate	0.395868	-0.42268	1			
Repo Rate	-0.37966	0.636563	-0.33944	1		
Nifty 50 ETF Return	0.129777	0.946944	-0.21259	0.439338	1	
Gold ETF Return	-0.06374	-0.68009	0.195845	-0.60219	-0.67007	1

Source: Compiled Data

CORRELATION ANALYSIS

Nifty 50 ETF & GDP Growth: Strong positive correlation (0.94) – higher GDP growth boosts equity ETF returns. Gold ETF & GDP Growth: Strong negative correlation (-0.68) – gold performs better during slower economic growth Nifty 50 ETF & Gold ETF: Strong negative correlation (-0.67) – when one rises, the other often falls; supports diversification. Repo Rate & Gold ETF: Strong negative correlation (-0.60) – rising interest rates lower gold returns Inflation & Nifty 50 ETF: Weak negative correlation (-0.21) – inflation slightly affects equity returns. inflation & Gold ETF: Weak positive

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correlation (0.19) – gold may act as a mild inflation hedge GDP Growth & Repo Rate: Strong positive correlation (0.63) central banks may raise rates during high growth.

Conclusion: If the p-value (from regression or correlation significance tests) is less than 0.05, we reject H_0 and accept H_1, meaning macroeconomic variables significantly influence ETF performance. If p-value is greater than 0.05, we fail to reject H_0, meaning no statistically significant effect is found.

FINDINGS OF THE STUDY

1. There exit and Nifty 50 ETF particularly visible in high-growth years such as 2016, 2021, and 2025. This suggests that equity-based ETFs respond positively to macroeconomic expansion.
2. Inflation negatively influenced Nifty 50 ETF returns, especially during high inflation years like 2020 and 2023. This highlights investor concerns over purchasing power erosion and rising costs, which tend to reduce equity performance.
3. In contrast, Gold ETFs performed better during high inflation years such as 2020 and 2023, reaffirming their role as a hedge against inflationary pressures in uncertain macroeconomic environments.
4. A decline in repo rate correlated with a rise in Nifty 50 ETF performance, particularly during the rate cuts of 2020 and 2021. Lower interest rates boosted market liquidity and investor sentiment, enhancing equity ETF returns.
5. During economic downturns like 2020 (COVID-19 pandemic), GDP contracted significantly, and equity ETFs recorded negative returns, whereas Gold ETFs surged, showing capital flight from equities to safe-haven assets.
6. Years with moderate inflation and stable repo rates (e.g., 2017 and 2018) showed relatively balanced performance in both Nifty 50 and Gold ETFs, reflecting a neutral macroeconomic influence.
7. The strongest positive performance of Nifty 50 ETFs occurred during years with robust GDP and low-interest rates (2021 and 2025), reinforcing the influence of pro-growth policies on equity markets.
8. Negative or weak GDP growth (e.g., -5.8% in 2020) was clearly linked with underperformance in Nifty 50 ETFs, while Gold ETFs outperformed, highlighting inverse reactions between equity and commodity ETFs during crises.
9. Fluctuations in repo rate had varying effects—lower repo rates tended to increase equity ETF returns, whereas hikes dampened equity markets but had mixed effects on Gold ETFs.
10. The cyclical nature of macroeconomic factors was reflected in ETF return patterns, suggesting that periodic analysis and macroeconomic tracking can enhance ETF investment timing.

SUGGESTIONS OF THE STUDY

1) Investors should monitor macroeconomic rate, and repo rate while making ETF investment decisions. These variables show strong correlations with ETF performance, particularly during volatile periods. Ignoring them can result in poor timing and misjudged entries.
2) Gold ETFs tend to perform better during high inflation or recessionary periods, serving as a hedge against macroeconomic instability. Long-term investors can consider increasing gold ETF allocations during early signs of inflation or slowing GDP.
3) The performance of equity ETFs, like Nifty 50, improves during phases rates and high GDP growth. Thus, monetary easing cycles could be ideal periods for accumulating equity-based ETFs.
4) Relying solely on one macroeconomic factor may not provide accurate forecasts. A multi-factor analysis approach (GDP, inflation, and interest rates) enhances reliability by filtering out misleading signals.
5) Regularly updating and validating macroeconomic data improves the accuracy of investment strategies. Relying on outdated or lagging indicators may lead to ineffective portfolio adjustment. Economic shocks had a clear impact on ETFs returns. Including crisis years in back testing helps assess the resilience of ETFs in extreme conditions.
6) Medium- to long-term trends offer clearer insights into ETF behaviour in response to macroeconomic factors. Short-term fluctuations may be misleading and more sensitive to speculation or temporary news events
7) Market participants should remain flexible and adjust strategies as macroeconomic conditions evolve. A rigid approach based on past data without contextual updates can hinder decision-making in dynamic markets.
8) Educational institutions and investment training programs can integrate macroeconomic analysis into ETFs portfolio management modules. This would help students and early investors understand the real-world application of economic indicators in shaping investment outcomes.
9) Policy makers and financial analysts can use ETF response trends as an indirect tool to assess public sentiment toward economic policies. Observing ETF flows during changes in interest rates or inflation can offer insights into market confidence and reaction to fiscal or monetary measures.

V. CONCLUSION

This study investigated the influence of key macroeconomic variables—GDP growth rate, inflation rate, and the repo rate—on the performance of Exchange-Traded Funds (ETFs) in India, specifically Nifty 50 ETFs and Gold ETFs, over

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the period from 2015 to 2025. The analysis revealed clear patterns and relationships that help decode how economic shifts impact investor behaviour and asset returns. It was found that equity-based ETFs, such as those tracking the Nifty 50, responded positively to strong GDP growth and low-interest rate environments, particularly during periods of economic expansion. In contrast, Gold ETFs tended to outperform during times of rising inflation and economic uncertainty, reaffirming their role as a hedge and safe-haven asset.

Additionally, repo rate fluctuations had a significant effect on ETF performance, with lower rates encouraging equity investment due to enhanced liquidity and investor optimism. The study emphasizes the value of monitoring macroeconomic indicators for making informed investment decisions. It contributes to the existing literature by providing empirical evidence that macroeconomic trends play a vital role in shaping ETF returns. Overall, the findings support the view that aligning investment strategies with economic cycles and key financial indicators can improve portfolio performance and risk management.

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