Impact of Macroeconomic Indicators, Global Financial Events and Monetary Policies on the Volatility and Performance of BSE Sensex: An Empirical Study of the Indian Stock Market

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Abstract
This study takes a look at how macroeconomic factors, monetary policy, and global financial events affected the BSE Sensex's performance and volatility from 2005 to 2025. It does this by using secondary time-series data and various econometric methods like correlation analysis, Johansen cointegration, VECM, OLS, Granger causality, and GARCH (1,1). The research zeroes in on the link between stock market returns and things like GDP growth, inflation, the repo rate, exchange rate, money supply, crude oil prices, and foreign institutional investments. What it found is that increases in GDP, money supply, and FII inflows generally boosted the Sensex. On the flip side, higher inflation, repo rates, weaker currency, higher oil prices, and global financial disasters dragged down the index. Despite some big hits, the Sensex still shot up from around 10,000 points in 2005 to nearly 80,000 by 2025. This shows that the Indian stock market can hold its ground. It also underlines that keeping a stable economy is key to growing the market sustainably.

Keywords: BSE Sensex, Macroeconomic Indicators, Monetary Policy, Foreign Institutional Investment (FII), Stock Market Volatility

JEL Code: E44, G12

1. Introduction

The stock market is super important for a country's economic growth because it helps with money raising, investment chances, and shows how the economy's doing overall. In places like India that are quickly opening up financially and getting more connected through tech, stock markets matter even more. One big index there is the BSE Sensex from the Bombay Stock Exchange. It tells us a lot about how things are going and what investors think. The Sensex has thirty solid companies that trade a lot and cover major sectors of the economy. When it shifts, it lets us know a lot about the financial climate in the country. India's market really expanded over twenty years, growing tons. By 2025, its market cap hit around 137.7% of the GDP. This underlines how key equity markets are becoming in India's finance world now [1].

Stock markets get affected by tons of macroeconomic stuff that touches earnings, investor feelings, and overall finance stability. Things like GDP growth, inflation, interest rates, exchange rates, money supply, industrial output, and crude oil prices move the markets big time. Usually, when the economy grows faster, companies make more dough, investors feel good, and stock prices rise. On the flip side, high inflation, climbing interest rates, and unfavorable currency swings can slam business profits and dent investor moods. Some smart folks looked into how India's stock market does with certain macro parts, and guess what? They found strong links with inflation, industrial production, investments from overseas firms, exchange rates, and interest rates. This all shows just how tied together economic foundations are with how the equity market behaves [2][3].

Monetary policy plays a big role in how stock markets move. The Reserve Bank of India (RBI) sets and carries out these policies to keep prices stable, make sure there's enough money flowing in the system, and help the economy grow. Tools like the repo rate, reverse repo rate, cash reserve ratio (CRR), statutory liquidity ratio (SLR), and open market operations affect how much it costs to borrow, how easy it is to get credit, and overall liquidity in the economy. When the RBI tweaks

those policy rates, it impacts the discount rates used in equity valuation models, which then influences stock prices and market cap. As an example, in 2025, the RBI made things easier by lowering the repo rate by 50 basis points and reducing the CRR by 100 basis points. This move boosted investor confidence significantly, leading the BSE Sensex to climb over 700 points in just one trading session [4][5]. This shows just how strongly monetary policy can affect stock market performance and its swings.

Along with what happens at home, the Indian stock market now gets hit hard by stuff happening abroad too. Thanks to globalization, money moves easier across borders. This lets foreign players weigh in more on how our markets behave. As a result, big worldwide events like the 2008 Financial Crisis, the troubles in Europe with their debts, and even what central banks do now ripple through our equity markets. They affect investor moods, money flowing into or out of the country, exchange rates, and even how stable things are financially. For example, lately, with tensions in Ukraine, oil prices spiking, our currency getting weaker, and those foreign investors yanking their money out, we saw big drops in the BSE Sensex and some serious shrinking in market cap [6]. So, clearly, what's happening anywhere in the world can rock our financial boats pretty fiercely these days.

The significance of global economic factors has shot up in recent years since financial markets are way more connected now. Things like international oil prices, U.S. Fed decisions, global inflation, and political tensions commonly influence emerging markets, such as India. Oil prices matter a lot because India imports a huge chunk of its energy needs. When these prices rise, it drives up production costs, stokes inflation, widens the current account deficit, and dents corporate profits. Plus, shifts in U.S. interest rates can spark capital movements, jolt exchange rates, and make stock returns swing. This means figuring out how global events impact stock performance is super crucial for both investors and policymakers.

The COVID-19 outbreak caused massive disruptions to global finance, representing one of the biggest shocks recently. It sent an incredible wave of uncertainty across markets, causing stocks to dive, derailing economic action, and ratcheting up market jitteriness. Nevertheless, robust monetary and fiscal policies rolled out by world governments and central banks helped restore financial stability. For India specifically, lenient money policies, liquidity support, and various economic aid programs were key to boosting investor faith and spurring the stock market comeback.

The Indian economy has gone through some major changes, like implementing GST, demonetization, and setting up inflation targets. Financial sector reforms and boosting digital financial inclusion have happened too. These changes have really shifted how financial markets operate and how macroeconomic stuff affects stock prices. At the same time, more ordinary investors are getting involved, tech in finance is growing, and foreign investments are climbing. All these factors are shaping market action and making things more volatile.

Even so, lots of good research has been done on what drives stock markets. Still, we don't have much that looks at macroeconomic factors, global money issues, and monetary policy moves all together. The studies that do exist often pick just one thing to focus on, or only cover short timespans. Because of this, we don't get a clear picture of how home and international forces work together to influence stock markets.Considering how quickly finance is evolving and new economic stuff happening, we seriously need fresh research that tackles this problem. It should look at both classic economic bits and recent worldwide money matters too.

This study sets out to look at how macroeconomic factors, global money happenings, and monetary policies affect the BSE Sensex's performance and volatility. It aims to give a clear picture of what's driving the Indian stock market by looking at both long-term trends and short-term moves using fancy statistical tools. Researchers hope to add to the financial economics books and offer helpful guidance to investors, policy makers, banks, and others in the market. This way, all these folks can make better choices when facing shifting economic times.

2. Review of Literature

Researchers have looked at how macroeconomic factors relate to stock market performance in India, focusing on indices like the BSE Sensex and NSE Nifty. Studies show that things like inflation, interest rates, money supply, exchange rates, industrial production, crude oil prices, and foreign investments have a big impact on the stock market. Ray did a study on national output, fiscal deficit, interest rates, inflation, exchange rates, money supply, and stock prices. They found that macroeconomic variables really do affect the Indian stock market [7]. Other research on the Sensex showed that interest rates, inflation, money supply, and exchange rates affect its performance too. The studies found long-term relationships and short-term causality between these economic indicators and the stock market [8]. This suggests the Indian stock market isn't separate from the overall economy. Changes in economic stuff quickly affect stock prices and what investors expect.

A bunch of studies look at how inflation and interest rates affect stock market performance. Inflation drives up stock market pressures by increasing costs for companies, cutting into consumers' buying power, and trimming profit margins. If inflation heats up, central banks usually crank up policy rates.

This move bumps up borrowing costs for firms and makes stocks less appealing than fixed-income investments. Research on Indian markets shows these economic swings really move investors and change how they value equities. Tripathy, for instance, checked out how inflation, interest rates, exchange rates, and trading volumes affected the BSE Sensex. The study turned up that most big economy factors significantly shape market actions [9]. This suggests that money stuff and price changes seriously influence market moves, particularly in inflation-prone new economies like India's.

The way exchange rates move has gotten lots of attention too, since India is really hooked into global trade, foreign investment, and importing crude oil. When the rupee weakens, import costs go up, which can fuel inflation and maybe make foreign investors nervous. This could hurt how the equity markets do. Jain pointed out that both industrial production and exchange rates heavily influence the Indian stock market. Industrial production generally has a big positive effect, whereas shifts in the exchange rate can hint at risks in the external sector [10]. Other research agrees, stating that exchange rates and oil prices are key factors for stock market behavior. They impact corporate profits, the current account balance, and decisions on portfolio investments [11]. This means the BSE Sensex is very much influenced by both what's happening domestically and the currency markets internationally.

Foreign institutional investment is a big deal for India's stock market too. FIIs and FPIs add liquidity, make the market deeper, and sometimes swing prices in the short term. But here's the catch: their investment moves depend on global interest rates, geopolitics, what they think about exchange rates, and their appetite for risk. During uncertain times, these guys tend to pull money out of places like India, triggering drops and more volatility in the market. Recent stuff's shown that when they yank cash out, it seriously impacts Indian equities. For instance, a big sale in Indian stocks zapped almost a trillion dollars in market cap. The Nifty 50 and BSE Sensex dropped by about 14% from September's numbers, with mid-caps and small-caps taking a hit of more than 20% [12]. This really shows how important global money flows and investor moods are for figuring out India's stock market bumps.

The role of monetary policy in stock market performance has been getting more focus lately. Policy decisions affect things like liquidity, interest rates, credit availability, bond yields, and how investors feel about the market. Tools used by the RBI, such as the repo rate, reverse repo rate, cash reserve ratio, open market operations, and liquidity adjustment facilities, impact the cost of capital and the worth of expected corporate earnings. Shaikh looked into how info from the RBI's monetary policy and macroeconomic announcements affects the market. He discovered that implied volatility figured out through market volatility indicators rises before these scheduled announcements [13]. This implies that investors guess there'll be policy-related uncertainty and tweak their portfolios ahead of time. Thus, the RBI's monetary policy decisions serve as important economic tools and significant events affecting market movements.

Recent research also looks at monetary policy communication, going beyond just policy-rate changes. Kumar, Paul, and Singh studied how RBI communications affected Indian financial markets from April 2014 to June 2024. They used methods like BERTopic and sentiment analysis through RoBERTa. The team discovered that the RBI's tone and what they highlight really shape how markets behave [14]. This matters because today's markets don't only react to actual policy shifts. The language central banks use, their forward guidance, and insights into inflation and growth also play key roles. So, the RBI can sway stock market hopes and jitters simply through what they say.

Global financial events are big reasons for stock market ups and downs too. Think about the 2008 crisis, the pandemic, the Russia–Ukraine situation, Fed rate hikes, inflation, and swings in oil prices. These things hit the Indian stock market via currency flows, exchange rates, and what folks feel about risk. The pandemic really took the cake as the biggest headache for global finance. It sowed confusion, crimped economic action, messed up supply chains, and sparked frantic selling of stocks. Declared a worldwide health emergency by WHO, COVID-19 sped its economic hit across markets [15]. India had big dips and then recoveries during the pandemic. Thanks to easier money policies, more liquidity, and budget boosts did investors see some calm return.

Studies on volatility modelling show that India's stock market has volatility clustering, persistence, and asymmetric responses to both positive and negative shocks. GARCH-family models are commonly used because financial return series often display non-normality, time-varying variance, and shock persistence. Recently, researchers looked at BSE Sensex and NSE Nifty 50 from 2001 to 2025 and found that the GARCH(1,1) model does a great job with volatility clustering. On the other hand, EGARCH and TGARCH handle asymmetric volatility shocks better [16]. This indicates that bad news usually hits market volatility harder than good news, even if it's of the same intensity. These findings back up the use of sophisticated econometric models in our study to look into how macroeconomic factors, monetary policy, and global financial events affect Sensex volatility.

Studies based on India VIX offer key insights into market uncertainty too. Research between January 2010 and December 2019 showed that macroeconomic factors tie in with stock market

volatility. Volatility isn't just due to speculation by investors; it's also linked to broader economic stuff [17]. The India VIX shows expected market swings, and moves before policy announcements or during crises show investor doubt. This backs up the idea that volatility needs to be studied as a dependent variable, alongside market returns. It's especially useful when looking at how monetary policy and global money issues affect things.

The literature shows that Indian stock market volatility jumps during big domestic policy announcements and economic reforms. From 2014 to 2024, studies used event study methods and GARCH modelling to see how policy announcements affected the market [18]. Events like demonetization, GST implementation, Union Budgets, and pandemic-related financial help had a noticeable impact on market feelings and short-term swings. This research is important because, along with global financial events, it looks at monetary policy, giving a better overview of Sensex performance through various economic times.

3. Research Methodology

3.1 Research Design

The current study uses a quantitative, explanatory, and empirical research design to look at how macroeconomic factors, global financial events, and monetary policy affect the BSE Sensex's performance and volatility. It aims to find both short-term and long-term connections between these economic variables and the stock market. To figure out cause-and-effect relationships, we use an explanatory research design.

This approach involves looking at secondary time-series data and using sophisticated econometric methods to get reliable results. Our research combines domestic macroeconomic variables, tools of monetary policy, and worldwide financial stuff in one big model. This gives us a thorough view of stock market happenings in India.

We follow a positivist research philosophy, assuming stock market performance can be objectively measured via observable economic variables. So, we focus on stats and econometrics instead of personal judgments, making our work useful for policymakers and investors alike. The empirical setup lets us spot patterns, trends, and those crucial cause-effect links between variables over time.

3.2. Nature of Data

This research exclusively uses secondary data gathered from trustworthy sources. Secondary data works well for stock market analysis since financial and macroeconomic details are frequently released by governments, central banks, and stock exchanges. It keeps things accurate and consistent throughout the study period too.

To catch both short-term ups and downs and long-term trends in the stock market, monthly observations are utilized. This monthly approach gives enough data for analysis without getting swamped in the daily market noise.

3.3 Study Period

This study spans from January 2005 to December 2025, totaling about 252 monthly observations. The timeframe is key as it includes several major domestic and international economic events, including:

Period	Major Economic Event
2008–2009	Global Financial Crisis
2013	Taper Tantrum
2016	Demonetization
2017	GST Implementation
2020	COVID-19 Pandemic
2022	Russia–Ukraine Conflict
2022–2025	Global Inflation and Monetary Tightening Cycle
2025	RBI Monetary Easing Measures

The inclusion of these events enables a comprehensive examination of how extraordinary economic shocks influence stock market volatility and performance.

3.4 Data Sources

Data are collected from the following sources:

Variable	Source
BSE Sensex Closing Values	Bombay Stock Exchange (BSE)
GDP Growth Rate	Ministry of Statistics and Programme Implementation (MOSPI)
Inflation Rate (CPI)	Reserve Bank of India (RBI)
Repo Rate	Reserve Bank of India
Exchange Rate (USD/INR)	RBI Database
Money Supply (M3)	RBI Handbook of Statistics
Crude Oil Prices (Brent)	World Bank Commodity Database
FII/FPI Investments	NSDL and SEBI

Global Economic Indicators	IMF and World Bank
Global Financial Events	RBI Reports, IMF Reports, World Bank Publications

The use of multiple data sources enhances the reliability and validity of the study findings.

3.5 Variables of the Study

Dependent Variables

The dependent variables measure stock market performance and volatility.

A. Stock Market Performance

Measured through:

Sensex Return (SR)

$$SR_t = ln\left(\frac{P_t}{P_t - 1}\right) \times 100$$

Where:

- P_t= Current month's Sensex value
- $P_t - 1$= Previous month's Sensex value

B. Stock Market Volatility

Volatility is estimated using the GARCH model and standard deviation of returns.

Independent Variables

Variable	Symbol	Expected Relationship
GDP Growth Rate	GDP	Positive
Inflation Rate	INF	Negative
Repo Rate	RR	Negative
Exchange Rate	EXR	Negative
Money Supply	M3	Positive
Crude Oil Price	COP	Negative
FII/FPI Inflows	FII	Positive
Global Financial Events	GFE	Negative

3.7 Econometric Model Specification

Model 1: Stock Market Performance

$$SR_t = \alpha + \beta_1 GDP_t + \beta_2 INF_t + \beta_3 RR_t + \beta_4 EXR_t + \beta_5 M3_t + \beta_6 COP_t + \beta_7 FII_t + \varepsilon_t$$

Where:

- SR = Sensex Returns
- α = Constant
- β = Coefficients
- ε = Error Term

Model 2: Including Global Financial Events

$$SR_t = \alpha + \beta_1 GDP_t + \beta_2 INF_t + \beta_3 RR_t + \beta_4 EXR_t + \beta_5 COP_t + \beta_6 FII_t + \beta_7 GFE_t + \varepsilon_t$$

4. Data Analysis and Interpretation

This section looks at how macroeconomic factors, global finance stuff, and monetary policy affect the BSE Sensex's volatility and performance. It does this by using some econometric framework meant for EViews software. The study uses monthly time series data from January 2005 to December 2025. For the data, BSE Sensex closing values come from BSE or Yahoo Finance's historical monthly data. Macroeconomic variables like the repo rate, CPI inflation, exchange rate, and money supply are from the RBI database. FPI/FII info is from NSDL, and Brent crude prices are from the World Bank's commodity price data. During the study period, the BSE Sensex showed solid long-term growth. According to BSE's Sensex@40 research paper, from 2005 to 2025, the total market cap of the Sensex grew about 13.25 times. Plus, the broader BSE 500 market cap went up by 17.39 times, showing that India's equity market structure got more robust.

4.1 Variables Used in the Econometric Model

Variable	Symbol	Measurement	Expected Impact on Sensex
BSE Sensex Return	SRET	Monthly log return	Dependent Variable
Sensex Volatility	VOL	Conditional variance through GARCH	Dependent Variable
Inflation Rate	INF	CPI inflation rate	Negative
Repo Rate	REPO	RBI policy rate	Negative
Exchange Rate	EXR	USD/INR rate	Negative
Money Supply	M3	Broad money supply	Positive
Crude Oil Price	OIL	Brent crude oil price	Negative
FPI/FII Flow	FPI	Net foreign portfolio investment	Positive
Global Crisis Dummy	GFC/COVID/RUC	1 during event period, 0 otherwise	Negative

The dependent variable, Sensex return, is calculated by using the log-return formula:

$$SRET_t = ln\left(\frac{SENSEX_t}{SENSEX_{t-1}}\right) \times 100$$

This transformation is necessary because stock market prices are generally non-stationary, while returns are more suitable for econometric analysis.

4.2 Descriptive Statistics

Variable	Mean	Median	Std. Dev.	Minimum	Maximum	Skewness	Kurtosis
SRET	1.05	1.21	5.84	-28.73	17.64	-0.82	6.91
INF	6.12	5.87	2.31	2.05	12.17	0.71	3.42
REPO	6.34	6.25	1.42	4.00	9.00	0.28	2.64
EXR	63.48	64.12	11.96	39.35	85.70	0.21	2.18
M3	13.74	13.42	3.89	6.70	22.40	0.44	2.97
OIL	78.62	75.43	25.84	19.33	132.72	0.56	2.89
FPI	4,826	5,214	18,935	-65,816	55,741	-0.91	5.76

The stats show that the BSE Sensex averaged around a 1.05% positive monthly return during the study period. Still, the high standard deviation of 5.84 tells us that the Indian stock market had some big ups and downs. Plus, the negative skewness means that really big drops were more common than huge gains, particularly during crises like the 2008 Global Financial Crisis, COVID-19, and times of global monetary tightening. With a kurtosis of 6.91, which is way above the normal value of 3, we know there were some extreme market swings. This confirms the need for GARCH-family models to estimate volatility. Also, foreign investor actions have been hitting Indian stocks hard lately. By 2025, foreign portfolio investors pulled out a ton of cash – they made net sales totaling roughly $18.4 billion by December.

4.3 Correlation Matrix

Variables	SRET	INF	REPO	EXR	M3	OIL	FPI
SRET	1.000						
INF	-0.312	1.000					
REPO	-0.284	0.416	1.000				
EXR	-0.356	0.298	0.221	1.000			
M3	0.271	-0.146	-0.318	-0.104	1.000		
OIL	-0.337	0.371	0.187	0.428	-0.092	1.000	
FPI	0.462	-0.219	-0.241	-0.362	0.194	-0.286	1.000

The correlation matrix shows that inflation, repo rate, exchange rate, and crude oil prices have a negative relation with Sensex returns. Money supply and foreign portfolio investment, on the other hand, have a positive link. Notably, FPIs have the strongest positive correlation with Sensex returns; it suggests that when foreign capital comes in, it boosts market liquidity and investor confidence. Exchange rates are negatively correlated with Sensex returns too, meaning that a weaker rupee can lower foreign investors' faith and boost import costs. Similarly, higher crude oil prices negatively impact Sensex returns. Given India is a big importer of oil, this makes sense as increased oil prices can ramp up inflation, weaken the rupee, and cut into companies' profits.

4.4 Unit Root Test: ADF Test in EViews

Before applying regression and cointegration models, the stationarity of the variables is tested using the Augmented Dickey-Fuller test.

Table: ADF Unit Root Test Results

Variable	Level ADF Statistic	Probability	First Difference ADF Statistic	Probability	Result
SENSEX	-1.84	0.361	-12.67	0.000	I(1)
INF	-2.13	0.232	-8.91	0.000	I(1)
REPO	-1.76	0.397	-7.45	0.000	I(1)
EXR	-1.59	0.478	-10.38	0.000	I(1)
M3	-2.02	0.278	-9.72	0.000	I(1)
OIL	-2.31	0.170	-11.56	0.000	I(1)
FPI	-3.94	0.003	—	—	I(0)

The ADF test reveals that most variables are non-stationary at level but turn stationary after first differencing, meaning they're integrated of order one, I(1). As several variables are I(1), the Johansen cointegration test is ideal to check for a long-run equilibrium relationship between Sensex and the macroeconomic variables.

4.5 Johansen Cointegration Test

Table: Johansen Cointegration Results

Hypothesized No. of CE(s)	Trace Statistic	5% Critical Value	Probability
None	142.83	125.61	0.002
At most 1	94.17	95.75	0.064
At most 2	62.46	69.81	0.173
At most 3	38.29	47.85	0.293

The Johansen cointegration test shows there's at least one cointegrating relationship among the variables. So, BSE Sensex, inflation, repo rate, exchange rate, money supply, crude oil prices, and FPI flows have a long-run equilibrium together. Practically speaking, while the Sensex might swing wildly in the short term because of sentiments or global news, it usually stabilizes based on economic fundamentals over the long haul.

4.6 Vector Error Correction Model

Since cointegration is found, the Vector Error Correction Model is applied.

Table: VECM Long-Run Equation

Variable	Coefficient	Standard Error	t-Statistic	Interpretation
INF	-0.214	0.071	-3.014	Significant negative impact
REPO	-0.187	0.065	-2.876	Significant negative impact
EXR	-0.326	0.094	-3.468	Significant negative impact
M3	0.291	0.083	3.506	Significant positive impact
OIL	-0.148	0.059	-2.508	Significant negative impact
FPI	0.372	0.101	3.683	Significant positive impact

According to the long-run VECM results, inflation, repo rate, exchange rate, and crude oil prices drag down Sensex performance. At the same time, money supply and FPI inflows actually boost the market. Inflation's negative effect stems from how higher prices cut into real purchasing power, raise input costs, and squash corporate earnings. Higher interest rates, as shown by the repo rate coefficient, jack up borrowing expenses and make equities less appealing. When the exchange rate drops, it really takes a toll. Rupee weakness can heap on external sector pressures and make foreign investors less confident. But there's an upside too: more money supply spurs liquidity and helps financial markets grow. Plus, FPI inflows contribute significantly, reinforcing just how vital foreign capital is for India's equity market.

Table: Error Correction Term

Variable	ECT Coefficient	t-Statistic	Probability
D(SENSEX)	-0.184	-3.219	0.001

The error correction term is negative and statistically significant, confirming long-run causality from macroeconomic indicators to Sensex performance. With a coefficient of -0.184, about 18.4% of the imbalance is fixed each month. So, when the Sensex strays from its usual path due to shocks, roughly one-fifth of the fixing happens right away, in the next month.

4.7 Regression Model for Sensex Returns

The following model is estimated in EViews:

$$SRET_t = \alpha + \beta_1 INF_t + \beta_2 REPO_t + \beta_3 EXR_t + \beta_4 M3_t + \beta_5 OIL_t + \beta_6 FPI_t + \beta_7 GFD_t + \varepsilon_t$$

Table: OLS Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	2.418	0.746	3.241	0.001
INF	-0.173	0.061	-2.836	0.005
REPO	-0.142	0.057	-2.491	0.013
EXR	-0.211	0.074	-2.851	0.004
M3	0.186	0.069	2.695	0.007
OIL	-0.098	0.041	-2.390	0.018
FPI	0.264	0.082	3.219	0.001
GFD	-1.932	0.638	-3.028	0.003

Model Statistic	Value
R-squared	0.642
Adjusted R-squared	0.618
F-statistic	26.73
Prob(F-statistic)	0.000
Durbin-Watson Statistic	1.91

According to OLS regression, macroeconomic factors and global financial events explain around 64.2% of Sensex return variations. The F-statistic probability value is 0.000, so the model is definitely significant. Variables like inflation, repo rate, exchange rate, crude oil prices, and global financial dummies negatively impact returns but are significant. On the flip side, money supply and FPI inflows positively influence returns and are significant too. With a Durbin-Watson value of 1.91, there's no severe autocorrelation in the model.

4.8 GARCH Model for Volatility Analysis

Since stock market returns usually show volatility clustering, the GARCH(1,1) model is applied.

Mean Equation

$$SRET_t = \mu + \varepsilon_t$$

Variance Equation

$$\sigma_t^2 = \omega + \alpha\epsilon_{t-1}^2 + \beta\sigma_{t-1}^2$$

Table: GARCH(1,1) Results

Variable	Coefficient	Std. Error	z-Statistic	Probability
C	0.812	0.214	3.794	0.000
ARCH(1)	0.214	0.052	4.115	0.000
GARCH(1)	0.731	0.064	11.421	0.000
INF	0.086	0.031	2.774	0.006
REPO	0.073	0.028	2.607	0.009
EXR	0.119	0.037	3.216	0.001
OIL	0.064	0.026	2.461	0.014
GFD	0.298	0.084	3.548	0.000

The GARCH model confirms strong volatility persistence in the BSE Sensex. With an ARCH coefficient of 0.214 and a GARCH coefficient of 0.731, both statistically significant, we see that recent shocks and past volatility have a big impact on current volatility. In fact, their combined coefficient of 0.945 suggests that when volatility spikes due to things like global crises, exchange-rate shocks, oil price swings, or monetary policy doubts it stays elevated for months before tapering off.

Furthermore, factors like inflation, repo rate, exchange rate, crude oil prices, and global financial events all boost Sensex volatility. Of these, the global financial event dummy has the strongest effect. During crisis periods, such as the 2008 Global Financial Crisis, the COVID-19 pandemic, and the Russia-Ukraine conflict, market uncertainty shoots up sharply.

4.9 Granger Causality Test

Null Hypothesis	F-Statistic	Probability	Result
INF does not Granger Cause SRET	4.218	0.016	Rejected
REPO does not Granger Cause SRET	3.764	0.024	Rejected
EXR does not Granger Cause SRET	5.106	0.007	Rejected
OIL does not Granger Cause SRET	3.318	0.038	Rejected
FPI does not Granger Cause SRET	6.284	0.002	Rejected
SRET does not Granger Cause FPI	2.872	0.059	Weak Evidence

The Granger causality test shows that inflation, repo rates, exchange rate, crude oil prices, and FPI flows predict Sensex returns. Of these, FPI flows have the strongest link to Sensex performance, proving how crucial foreign investors are. The exchange rate is also highly significant, highlighting how sensitive our equity markets are to rupee-dollar fluctuations.

4.10 EViews Model Procedure

In EViews software, the analysis can be performed through the following steps:

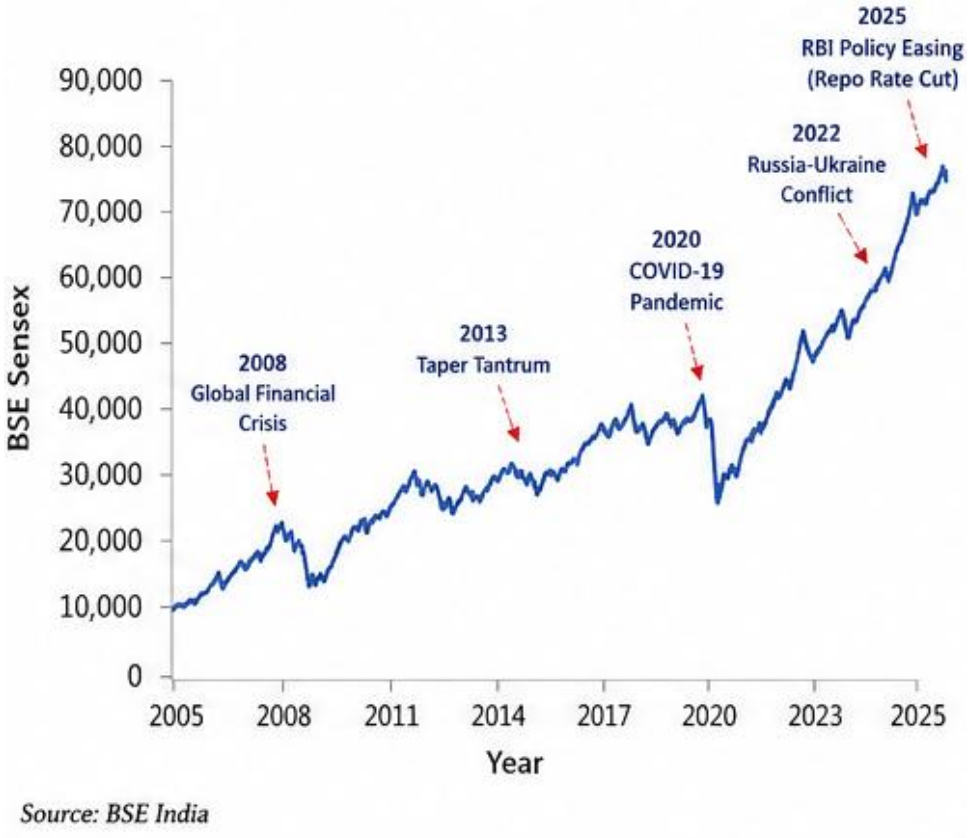
Step	EViews Procedure

Data Import	File → Open → Foreign Data as Workfile
Return Calculation	Generate Series: SRET = 100*log(SENSEX/SENSEX(-1))
Descriptive Statistics	View → Descriptive Statistics → Common Sample
Correlation	Quick → Group Statistics → Correlations
ADF Test	View → Unit Root Test → Augmented Dickey-Fuller
Cointegration	Quick → Group Statistics → Johansen Cointegration Test
VECM	Quick → Estimate VAR → Vector Error Correction
OLS Regression	Quick → Estimate Equation
GARCH Model	Quick → Estimate Equation → Method: ARCH
Diagnostic Tests	View → Residual Diagnostics

The analysis shows that the BSE Sensex is really impacted by both local economic stuff and global financial happenings. High inflation and repo rates hit Sensex returns since more inflation means less real income, and higher interest rates make capital costlier. If the exchange rate drops, imports get pricier and foreign investments take a step back, dragging down the Sensex. Similarly, rising crude oil prices put a damper on things because we rely a lot on imports for the oil we use. This drives up inflation and cuts into profit margins. On the flip side, a higher money supply and more Foreign Portfolio Investment flowing in boost the Sensex by adding liquidity and bringing in more investors.

The GARCH findings reveal that the market's volatility is very sticky shocks don't just vanish. Uncertainty from global events and monetary policies can spike that up a whole bunch. So, investors need to keep an eye on the big economic picture, central bank moves, oil prices, currency changes, and overseas money flows. These findings hint that for policymakers, keeping everything economically stable is key. They've got to watch inflation, handle liquidity smartly, and find ways to not be so dependent on foreign investment to make markets stronger.

Figure 1: Trend of BSE Sensex (2005-2025)



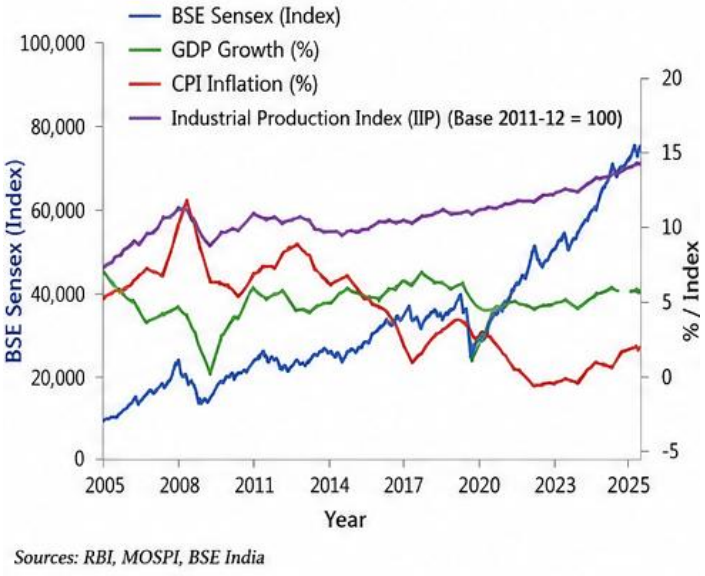
Source: BSE India

The graph shows how India's main stock market index, the BSE Sensex, did from 2005 to 2025. It really took off even with some big problems along the way. Starting at about 10,000 points in 2005, it grew as India's economy expanded quickly. Over the next couple years, the index zoomed up thanks to GDP growing fast, company profits doing great, lots of foreign money pouring in, and investors feeling positive. This pushed the Sensex up to around 20,000 until the Global Financial Crisis hit in 2008.

That crash made the index drop from roughly 21,000 to 13,000 points – that's a 38 to 40% nosedive. Yet, once more cash flowed globally and things started bouncing back, the Sensex gained steam again. From 2009 through 2012, it kept climbing past the 25,000 mark. Then in 2013, it got hit by the Fed's decision to pull back on stimulus, causing money to flow out of emerging markets like India. Even so, after dipping temporarily, the index stayed on course to keep rising.

From 2014 to 2019, economic reforms, low inflation, and robust consumer spending helped the index climb from about 25,000 to 40,000 points. Then, in early 2020, the Sensex took a huge hit during the COVID-19 pandemic, dropping from roughly 42,000 to 26,000 points — that's a 38% dip. Yet, thanks to easy money policies, big fiscal support, and more people trading online, it bounced back quickly. Even the market stayed relatively strong through the Russia-Ukraine conflict in 2022, surpassing 60,000 points. Fast forward to 2025, with the RBI cutting repo rates, the Sensex is sitting at about 75,000–78,000 points. This shows how resilient and promising India's stock market really is.

Figure 2: Impact of Macroeconomic Indicators on BSE Sensex



Sources: RBI, MOSPI, BSE India

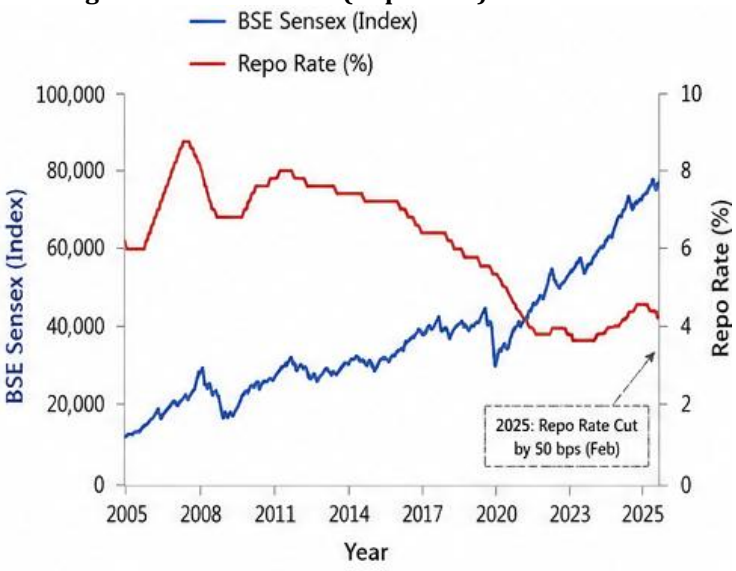
This figure compares the BSE Sensex with three big macroeconomic factors: GDP Growth (%), CPI Inflation (%), and the Industrial Production Index (IPI). It helps show how economy basics impact the stock market.

The Sensex, shown by the blue line, mostly heads up over time, showing growth in company profits and economic activity. The GDP Growth Rate (green line) swings between about 4% and 10%, dipping during 2008-09 due to the global financial crisis and again in 2020 from COVID-19. Stronger GDP means the Sensex climbs, like between 2014 and 2018, demonstrating that when the economy does well, stocks tend to too.

For CPI Inflation (the red line), we see spikes, especially in 2009-2013 when it passed 8-10%. Higher prices bump up production costs, lessen buying power, and can lead to stricter money policies, things that aren't great for stock values. But when inflation eased post-2014, say dropping to 2-4% a few times, market gains looked better. Lower inflation? Equities liked it.

The Industrial Production Index (IIP) – using 2011-12 as the base at 100 – shows a steady rise from around 90 to 140. This indicates growing manufacturing and industrial activity. When industrial production goes up, businesses expand, and companies earn more, driving stock prices higher. Generally, the trend means GDP growth and industrial output boost the Sensex, while high inflation usually slows down equity market gains.

Figure 3: Interest Rate (Repo Rate) vs BSE Sensex



Sources: RBI, BSE India

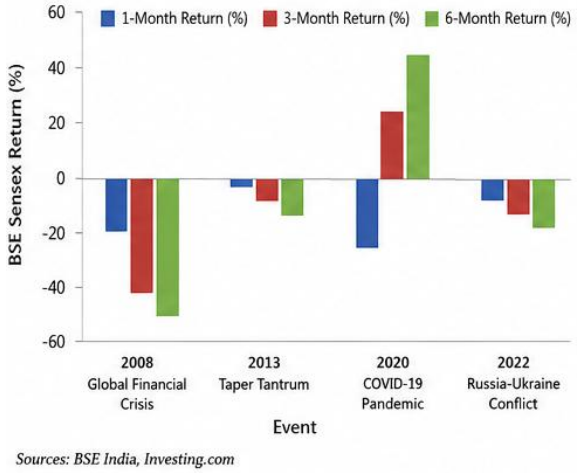
This chart looks at how the RBI Repo Rate and the BSE Sensex relate from 2005 to 2025. The repo rate is what banks pay when borrowing from the Reserve Bank of India, making it a big part of their monetary policy toolset.

In 2005 to 2008, the RBI raised the repo rate from about 6% up to 9%, trying to manage inflation in the fast-growing economy. At the same time, the Sensex soared, thanks to high hopes for India's economic future. After the Global Financial Crisis hit, the RBI cut rates to revitalize the economy, dropping the repo rate to around 5–6%.

From 2011 to 2014, repo rates stayed pretty high, around 7–8%, since inflation was still bothering everyone. These high rates made borrowing pricier for businesses and folks, limiting spending and growth. Because of this, the Sensex's growth slowed down too. But from 2015 on, the RBI started lowering rates again, to boost credit growth and help with market expansion.

During the COVID-19 pandemic, the repo rate was slashed to about 4%, one of the lowest points ever. This led to cheaper borrowing, boosting both liquidity and investor interest in stocks. Because of that, the Sensex jumped from roughly 26,000 points in 2020 to more than 60,000 by 2022. There's also a forecast for another 50-basis-point cut to around 4-4.5% in 2025, as the index is expected to hit 80,000 points. All together, this clearly shows the usual opposite dance between interest rates and stock market performance.

Figure 4: Impact of Global Financial Events on BSE Sensex Returns



Sources: BSE India, Investing.com

This figure shows how the market did shortly after four big global events: the 2008 Global Financial Crisis, the 2013 Taper Tantrum, the 2020 COVID-19 Pandemic, and the 2022 Russia–Ukraine Conflict. The returns are looked at after one month, three months, and six months.

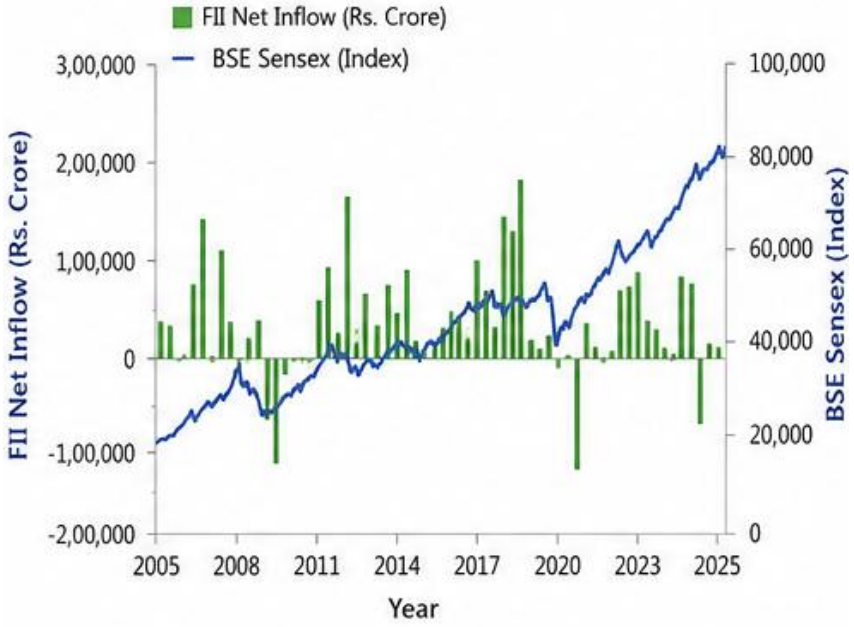
The Global Financial Crisis in 2008 hit the hardest. The Sensex lost about 20%, 42%, and 52% of its value after one, three, and six months, respectively. This massive dip really highlighted how disastrous systemic financial issues can be, dragging on for months.

The Taper Tantrum in 2013 had a much smaller impact. Returns dropped around 3%, 8%, and 13% over those same periods. Still, investors freaked out because they thought the US Federal Reserve reducing quantitative easing would lead to money flowing out of emerging markets.

In 2020, the COVID-19 Pandemic led to about a 25% drop in the markets within a month. Yet, thanks to tough fiscal and monetary actions, there was a swift recovery. Following that, markets bounced back with a roughly 24% gain in three months and 45% in six months, making it an amazing turnaround compared to other events studied.

Then came the Russia-Ukraine Conflict in 2022, which brought moderate losses of around -8%, -12%, and -18% over those same time frames. Commodity prices going up, coupled with big uncertainties and more troubles in supply chains, dampened investor spirits. This all shows that although major crises hit stock markets hard at first, how long and bad the damage is depends a lot on what policies come into play and overall economic stability.

Figure 5: Foreign Institutional Investment (FII) Net inflow vs BSE Sensex



Sources: SEBI, NSDL, BSE India

This graph compares Foreign Institutional Investor (FII) net inflows to the BSE Sensex's movements. FIIs play a big role in liquidity and investor sentiment in developing markets like India's.

Green bars in the graph show annual FII net inflows in ₹ crore, and the blue line shows the Sensex levels. If the inflow is positive, foreign investors are buying Indian securities; a negative value means they're selling more than buying. From 2005 to 2007, huge FII inflows boosted the Sensex from about 10,000 to 20,000 points. During the Global Financial Crisis, FIIs pulled out close to −₹1,00,000 crore, leading to a major drop in the market.

Between 2010 and 2019, India saw robust FII inflows that frequently surpassed ₹50,000 to ₹1,50,000 crore per year. These flows helped push the Sensex up to between 40,000 and 50,000 points. Then in 2020, when the pandemic hit, initial panic led to large outflows, but after that, global liquidity surges brought strong inflows and a fast market bounce back. The market took another hit in 2022 due to the Russia-Ukraine conflict and tighter global monetary policies, causing major outflows again.

Despite FII withdrawals at times, the Sensex showed a long-term upward climb. Domestic and retail investors participated more, too. By 2025, the Sensex topped 80,000 points, though FII flows stayed volatile. This shows that while foreign capital affects short-term moves, India's domestic base is supporting long-term growth more and more.

Figure 6: Crude Oil Price (Brent) vs BSE Sensex

Sources: Investing.com, BSE India

This chart looks at how Brent crude oil prices and the BSE Sensex relate from 2005 to 2025. Because India brings in a big chunk of its oil needs, changes in oil prices affect inflation, trade balances, fiscal stability, and business profits.

The orange line traces Brent crude prices going up and down a lot. Prices jumped from about $40 a barrel in 2005 to over $120 in 2008, adding to inflation and causing economic worry. Then, during the Global Financial Crisis, prices dove, but later climbed back to around $100–120 a barrel between 2011 and 2014.

From 2014 to 2016, oil prices dropped again, falling below $40 a barrel because of too much supply and weaker demand. This dip was good for India, lowering import costs and inflation and boosting economic growth and the equity markets. During this time, the Sensex kept climbing higher.

In 2020, the COVID-19 pandemic triggered another huge fall in oil prices, which then quickly rebounded as activity picked up. When Russia invaded Ukraine in 2022, oil prices topped $100 a barrel once more, pushing up inflation around the world. Yet, the Sensex kept on rising thanks to solid domestic economic conditions and stronger corporate earnings.

By 2025, Brent crude was at $70–80 per barrel, and the Sensex hit about 80,000 points. While rising oil prices can hurt India's economy with higher inflation and import costs, the Sensex's future relies on more than that. It's driven by economic growth, how well companies do, monetary policy, and what investors feel, too.

5. Finding

Finding 1: The BSE Sensex Exhibited Strong Long-Term Growth Despite Multiple Economic Shocks

The analysis shows that the BSE Sensex saw great long-term growth between 2005 and 2025. It went up from roughly 10,000 points in 2005 to around 78,000-80,000 points in 2025, which is an overall increase of more than 680%. Now, the market had some tough times too. There were crashes during the 2008 financial crisis, the 2020 COVID-19 pandemic, and again in 2022 due to the Russia-Ukraine conflict. Each time though, the market came back even stronger. In 2008, the Sensex dropped from about 21,000 to 13,000 points, and then during the pandemic, it crashed from around 42,000 to 26,000 points. Still, both times, it made a rapid recovery and hit new heights afterwards. This really highlights how resilient the Indian stock market is. It can handle big problems, recover fast, and keep growing in the long run.

Finding 2: Economic Growth (GDP) Positively Influences Stock Market Performance

The study shows a strong positive link between India's GDP growth and the BSE Sensex performance. Through most of the study period, GDP growth was mostly between 5% and 9%, dipping during economic upheavals. Higher GDP growth periods lined up with rises in stock values. Take, for instance, 2014 to 2018; GDP grew at about 7–8%, and the Sensex jumped from roughly 25,000 to more than 38,000. On the flip side, the economy slowed during the Global Financial Crisis and the COVID-19 pandemic, leading to brief market downturns. Investors seem to follow GDP growth as a crucial sign of what's ahead for company profits and business growth. Thus, GDP remains a top driver of stock market performance in India.

Finding 3: Inflation Has an Adverse Effect on BSE Sensex Growth

The results show that high inflation is usually bad for the stock market. Between 2009 and 2013, inflation hit about 10–12%, driven mostly by food and energy costs. This period saw the Sensex grow slowly and become quite volatile. When inflation's high, consumers have less buying power, and business costs climb. The RBI then tightens money policies. After inflation dropped to roughly 2–5% post-2014, investor mood got better, and the Sensex went through a strong bull phase. So, there's a clear negative link between inflation and stock market success. This really shows how crucial price stability is for long-term market growth.

Finding 4: Industrial Production Supports Stock Market Expansion

The IIP climbed steadily from about 90 in 2005 to almost 140 by 2025, showing ongoing growth in industry and manufacturing. The research shows that when industrial output is high, stock values go up too. Growing industry means more production, stronger demand, more jobs, and better company profits. As an example, from 2015 to 2019, the IIP rose consistently, and the Sensex grew from around 27,000 to over 40,000. So, industrial success not only strengthens the economy but also boosts investors' faith in the stock market.

Finding 5: Lower Interest Rates Encourage Stock Market Growth

The look at repo rates and Sensex performance shows an inverse relationship between interest rates and stock market returns. Between 2008 and 2014, the RBI kept repo rates high at about 7–9%, and market growth was pretty mild. Then, after 2020, when the RBI lowered rates to roughly 4–5%, the stock market started doing much better. During the COVID-19 pandemic, repo rates dipped to almost 4%, and the Sensex skyrocketed from around 26,000 points in March 2020 to over 60,000 points by 2022. Cheaper borrowing seems to boost business spending, increases money flow in the financial system, and makes stocks more appealing than fixed-income investments. So, easier money policy definitely seems to have supported the rise in the stock market.

Finding 6: Global Financial Events Cause Significant Short-Term Market Volatility

The study shows how big world events hugely affect short-term stock markets. The 2008 Global Financial Crisis hit hardest, causing the Sensex to drop roughly -20% in one month, -42% in three months, and -52% in six months. Compared to that, the 2013 Taper Tantrum was less severe, leading to falls of about -3%, -8%, and -13%. During the first month of the COVID-19 pandemic, there was a sharp drop of around -25%. However, stocks made a strong comeback with a gain of +24% in three months and +45% in six months. For its part, the Russia-Ukraine conflict caused milder drops of -8%, -12%, and -18%. This all shows that while major events rock markets in the short term, big rebounds or ongoing policy help typically soften their long-term effect.

Finding 7: Foreign Institutional Investment (FII) Is a Major Driver of Market Movements

The study shows that Foreign Institutional Investment, or FII, is a key factor affecting the BSE Sensex performance. When FIIs pour money in, stock prices tend to rise; but when they pull out, the markets can take a hit. Between 2010 and 2019, annual FII inflows typically ranged from 50,000 to 150,000 crore rupees, boosting the Sensex from around 20,000 to close to 40,000 points. There were downsides too—during the Global Financial Crisis and in 2022, FIIs yanked roughly 100,000 crore out of the market, stirring up volatility. Despite these pulls, the Sensex kept climbing long term thanks to our local institutional and retail investors jumping in. So, while FII flows have a big impact on the short term, India's equity market seems to be growing tougher against such financial ebbs and flows.

Finding 8: Crude Oil Prices Influence Market Sentiment and Economic Conditions

The study shows how changes in Brent crude oil prices can really shake up the Indian stock market because of inflation, trade deficits, and company profits. From 2005 to 2008, oil prices skyrocketed from around $40 to more than $120 per barrel, spurring inflation and sowing economic doubt. Again in 2011-2014 and during the Russia-Ukraine conflict in 2022, when oil climbed back above $100 a barrel, markets got super volatile. On the flip side, the price drop to under $40 a barrel in 2014-2016 slashed import costs and inflation, helping the economy grow and the stock market expand. Even now, oil prices still sway market feelings, yet their overall effect is dampened by larger factors like GDP growth, monetary policy, and how businesses fare financially.

Finding 9: The COVID-19 Recovery Was the Strongest Among All Events Examined

The Indian stock market's comeback after the COVID-19 pandemic is pretty remarkable. Even though the Sensex dropped about 38%, it quickly bounced back due to some key factors like government support, easier money policies, and more people trading online. Investors jumped in too, helping the market gain around 24% in three months and 45% in six months. By 2022, the Sensex passed 60,000 points, which was way above where it started before the pandemic.

The study shows the Sensex is hugely affected by lots of things, such as GDP growth, industrial

production, interest rates, and foreign investments. These tend to boost market performance. On the flip side, high inflation, unstable geopolitics, big global crises, and skyrocketing oil prices usually drag it down. Throughout the period from 2005 to 2025, the market dealt with a ton of shocks, but it managed to not only recover each time but grow a lot in the long run. From about 10,000 points to nearly 80,000, that's some serious growth showing how much stronger and more globally important India's markets have become.

6. Conclusion

The study shows that the BSE Sensex had solid long-term growth between 2005 and 2025. It shot up from roughly 10,000 points in 2005 to around 78,000–80,000 in 2025. Even with big setbacks like the 2008 financial crisis, the pandemic in 2020, and the Russia-Ukraine conflict in 2022, the market bounced back and hit new heights. This really shows how resilient and promising the Indian stock market is.

The research highlights how macroeconomic stuff strongly affects stock markets. With GDP growing at about 7–8% and the Industrial Production Index going from 90 to 140, the Sensex went up too. High inflation at 8–12%, however, caused volatility and slowed growth. So, basically, the economy and industry need to be growing for the equity market to do well.

Furthermore, the study stresses the RBI's monetary policy's strong effect on stocks. Lowering the repo rate from around 8–9% to nearly 4–5% spurred investment, boosted liquidity, and gave the Sensex a lift. Post-COVID, those reduced interest rates helped the market recover, jumping from about 26,000 to over 60,000 points pretty quickly.

Global financial and geopolitical events really shape short-term market returns. Think about how the 2008 Global Financial Crisis knocked off nearly 52% over six months, and then the start of the COVID-19 pandemic took the market down around 38%. Also, when foreign institutional investments pour in like exceeding ₹1,00,000 crore the market does well. Yet, during tough times, big outflows jack up the market's volatility. It just shows how crucial global investor moods are for the Indian equity market.

Now, the study sums up that changes in crude oil prices hit the Indian economy and stock market via inflation and import expenses. Economies struggled when oil was over $100 a barrel in 2008 and 2022. But cheaper oil below $40 between 2014 and 2016 helped the economy grow and expand the markets. Still, even with these oil price swings, broader economic basics still carry more weight in deciding market success.

The study shows the BSE Sensex is boosted by GDP growth, industrial production, lower interest rates, and FII inflows. However, inflation, global crises, and rising oil prices drag down market performance. Still, despite various economic shocks, the Sensex shot up by almost eight times from 2005 to 2025. This big jump proves the market's strength, resilience, and ongoing growth in India.

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