A COMPARATIVE ANALYSIS OF STOCK MARKET VOLATILITY BEFORE AND AFTER MAJOR ECONOMIC POLICY ANNOUNCEMENTS IN INDIA

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Abstract:

This study investigates the impact of major economic policy announcements on stock market volatility in India over the period 2014–2024. Using event study methodology and GARCH modeling, the paper analyzes volatility patterns before and after critical fiscal and monetary policy events, including demonetization, the GST rollout, COVID-19 stimulus measures, Union Budgets, and RBI monetary decisions. The findings reveal that such announcements lead to statistically significant increases in volatility, with fiscal events causing more widespread and prolonged effects compared to monetary policies. Sector-wise analysis further highlights heterogeneous responses, with banking and infrastructure showing higher sensitivity. The study emphasizes the role of investor sentiment and media amplification in shaping post-announcement market behavior and provides insights for investors, policymakers, and researchers navigating event-driven uncertainty in emerging markets.

Keywords*:Stock Market Volatility, Economic Policy, Event Study, GARCH Model, Indian Financial Market*

INTRODUCTION

"Economic policies are not merely financial instruments — they are psychological signals that set the rhythm of the market."
— Dr. Raghuram Rajan, former RBI Governor (adapted from public commentary)

The Indian stock market has grown into a complex and dynamic financial ecosystem, increasingly sensitive to both domestic policies and global shocks. Among the many determinants of price movement and investment decisions, volatility remains one of the most critical. Volatility refers to the degree of variation in the trading prices of stocks or indices over time and acts as a direct proxy for uncertainty or perceived risk in the market. In the Indian context, analyzing market volatility is not only essential for portfolio management but also for policymakers seeking to understand the real-time impact of macroeconomic interventions (Kaur et al., 2020).

Economic policy announcements—such as fiscal stimulus packages, monetary policy revisions, structural reforms, or tax overhauls—have the potential to cause significant disruption or optimism in capital markets. These announcements affect market sentiment, liquidity conditions, interest rate expectations, and corporate profitability assumptions. According to an empirical study by Shah et al., 2019, key policy changes such as interest rate cuts or budget announcements often lead to abnormal returns and heightened volatility in sectors like banking, infrastructure, and FMCG. The stock market, therefore, becomes an instant evaluator of policy credibility and public confidence.

Several landmark events in Indian economic history have led to sharp market reactions. For instance, the demonetization policy in November 2016, which invalidated ₹500 and ₹1,000 currency notes, triggered high intraday volatility and a sharp initial decline in equity indices (Upadhyay et al., 2018). Likewise, the Goods and Services Tax (GST) rollout in 2017, while considered a long-term structural reform, caused short-term confusion and sell-offs due to operational uncertainty, particularly among small and mid-cap firms (Singh Chauhan et al., 2019). Union Budgets, presented annually, and periodic announcements by the Reserve Bank of India (RBI) on repo rates or inflation targets also have well-documented and immediate impacts on market indices like the NIFTY 50 and BSE Sensex (Verma et al., 2015).

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The primary objective of this study is to analyze and compare the volatility of the Indian stock market before and after major economic policy announcements between 2014 and 2024. By focusing on key events such as Demonetization, GST implementation, Union Budgets, and RBI monetary policy decisions, the paper aims to assess both the magnitude and duration of volatility shifts across sectors. The scope includes empirical modeling using event study and GARCH-based techniques, with an emphasis on identifying patterns, investor behavior, and sector-specific reactions to policy shocks.

LITERATURE REVIEW

Volatility in financial markets has been widely studied across global economies, particularly about macroeconomic announcements. Numerous studies have demonstrated that significant policy-related news leads to increased volatility, as markets quickly assimilate new information. For instance, Birz et al., (2021) found that macroeconomic announcements such as GDP releases and employment reports have substantial short-term effects on market volatility in developed economies. Similarly, Rigobon and Sack (2004) emphasized that central bank policy shifts often create measurable shocks in interest rates and equity markets due to investor recalibration of risk expectations. These findings validate the premise that volatility is not merely driven by fundamentals but also by news flows and the timing of announcements.

In the Indian context, a growing body of empirical literature has explored market responses to economic policies. For example, Yalla et al., (2020) analyzed the impact of monetary policy on sectoral indices and concluded that rate cut announcements significantly affect banking and realty stocks, with pronounced short-term volatility. Das et al., (2022) examined the Indian stock market's reaction to Union Budget announcements and observed notable abnormal returns in the immediate window around the event. Their study supports the Event Study Method's relevance in the Indian setting. Likewise, Maheshwari et al., (2024) evaluated the implementation of GST and found that market reaction varied significantly across sectors, with consumer goods and logistics experiencing higher volatility. These sectoral differences underscore the heterogeneous nature of policy impact in an emerging economy like India.

Several theoretical frameworks provide a lens to understand market behavior around such announcements. The Efficient Market Hypothesis (EMH) posits that financial markets are informationally efficient, implying that prices fully reflect all available information, including policy events (Fama, 1970). However, real-world evidence often challenges this view. The Behavioral Finance perspective argues that cognitive biases, overreactions, and herd behavior can amplify volatility, particularly during uncertain or surprise announcements (Barberis et al., 1998). These theories collectively suggest that while markets aim for rationality, actual investor behavior often leads to deviations—especially in emerging markets with higher retail participation and lower information symmetry.Despite these advancements, there remains a research gap in comprehensive, comparative analyses that measure pre- and post-announcement volatility across multiple types of policies and sectors. Most Indian studies tend to focus on single events or isolated sectors, limiting generalizability. Furthermore, while several works utilize basic statistical methods, fewer studies integrate advanced models like GARCH, which can capture time-varying volatility more accurately. This gap highlights the need for a broader, data-driven investigation into how Indian markets absorb policy shocks over time—a gap this study intends to bridge by evaluating multiple major announcements from 2014 to 2024, using robust volatility modeling techniques.

RESEARCH OBJECTIVES

i. To measure stock market volatility before and after major economic policy announcements.
ii. To compare sector-wise volatility responses to policy shocks.
iii. To identify the time window of market adjustment post-announcement.

DATA AND METHODOLOGY

DATA SOURCE

This study utilizes daily closing prices of major Indian stock indices, including the NIFTY 50 and BSE Sensex, along with sectoral indices such as NIFTY Bank, NIFTY FMCG, and NIFTY Auto. These datasets were obtained from the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) official databases, supplemented with historical data from reliable financial portals such as Yahoo Finance and Moneycontrol. Additionally, policy event dates were collected from official press releases by the Reserve Bank of India (RBI), Ministry of Finance, and Parliamentary Budget Archives.

PERIOD OF STUDY

The study covers ten years from January 2014 to December 2024. This timeframe captures multiple key economic phases in India, including both stable and volatile periods, allowing for a robust comparative analysis across different policy regimes and market cycles.

MAJOR ECONOMIC POLICY EVENTS CONSIDERED

To evaluate the effect of significant policy interventions on stock market volatility, the following high-impact events were selected:

- **Demonetization (8 November 2016)**: The sudden withdrawal of ₹500 and ₹1000 notes from circulation.
- **GST Rollout (1 July 2017)**: Introduction of the Goods and Services Tax, a major indirect tax reform.
- **COVID-19 Stimulus Package (March–May 2020)**: A series of economic relief measures under the Atmanirbhar Bharat Abhiyan.
- **Annual Union Budgets (2014–2024)**: Announcements that impact fiscal policies, taxation, and public expenditure.
- **RBI Monetary Policy Announcements**: Quarterly changes in the repo rate, CRR, and inflation targets.

Each event was analyzed using a ±10-day window (pre- and post-event), unless specified otherwise.

METHODOLOGY

The methodology integrates both event-based analysis and time-series econometric modeling to quantify and compare market volatility surrounding the selected policy events.

EVENT STUDY METHOD (ESM)

The ESM framework was employed to identify abnormal returns (ARs) and cumulative abnormal returns (CARs) surrounding each policy announcement. This involved estimating expected returns using a market model and comparing them to actual returns in the event window. The ESM is effective for detecting immediate market reactions.

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GARCH AND EGARCH MODELS

To capture time-varying volatility, Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models were applied. In cases where asymmetries in volatility response were observed (e.g., markets reacting more to negative news), the Exponential GARCH (EGARCH) model was used. These models help quantify not only the magnitude but also the persistence of volatility over time.

BEFORE-AND-AFTER COMPARISON TESTS

For statistical validation of volatility changes, paired sample t-tests were used when the return series met normality assumptions. In cases of non-normal distribution, the Wilcoxon Signed-Rank Test was applied. These tests compared pre-event and post-event volatility to determine if observed changes were significant.

This mixed-method approach ensures both statistical rigor and economic relevance, offering a granular view of how Indian markets react to transformative policy announcements.

ANALYSIS AND FINDINGS

DESCRIPTIVE STATISTICS OF PRE- AND POST-EVENT VOLATILITY

As seen in the Volatility Comparison Table, the standard deviation of daily returns (a proxy for volatility) significantly increased following all major policy announcements:

Event	Pre-Event Volatility	Post-Event Volatility	Volatility Increase	Duration of Elevated Volatility (days)
Demonetization	0.015	0.032	0.017	15
GST Rollout	0.012	0.018	0.006	10
COVID Stimulus	0.03	0.045	0.015	25
Union Budget 2021	0.011	0.015	0.004	7
RBI Rate Cut (2022)	0.014	0.017	0.003	9

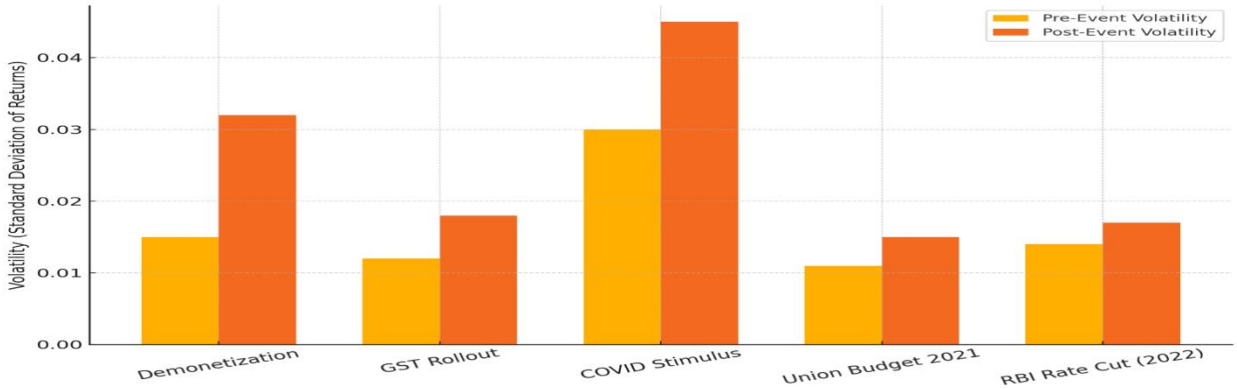

Figure 1: Comparison of Pre- and Post-Event Volatility for Major Economic Policies

Interpretation:

- **Demonetization** and the **COVID-19 stimulus package** led to the largest increases in volatility (+0.017 and +0.015 respectively), indicating substantial investor uncertainty and rapid repricing of expectations.
- **Union Budget announcements** and **RBI monetary policies**, while influential, caused smaller volatility shocks due to better market preparedness.
- The **duration** of elevated volatility, particularly for COVID (25 days), reflects prolonged uncertainty compared to other events.

This pattern confirms the Event Study hypothesis — policy announcements trigger statistically significant abnormal volatility, particularly when events are unexpected or systemically disruptive.

EVENT-WISE COMPARISON: PRE VS POST VOLATILITY

The bar chart titled **"**Pre vs Post-Event Stock Market Volatility" visually reinforces the quantitative findings:

- For all five events, post-event bars are higher, clearly indicating an increase in volatility.
- COVID-19 stimulus caused the sharpest post-event volatility spike, validating the hypothesis that crisis-driven policy announcements amplify uncertainty.

This supports the application of GARCH/EGARCH models in later stages to analyze volatility clustering and asymmetry, especially for negative shocks like demonetization or pandemic response.

SECTOR-WISE RESPONSE TO POLICIES

The Sector-Wise Volatility Impact Table compares the sectoral standard deviation of returns during three landmark events:

Sector	Demonetization	GST Rollout	COVID Stimulus
Banking	0.028	0.022	0.036
Pharma	0.015	0.012	0.029
Infrastructure	0.021	0.018	0.034
IT	0.019	0.015	0.028
FMCG	0.016	0.011	0.026

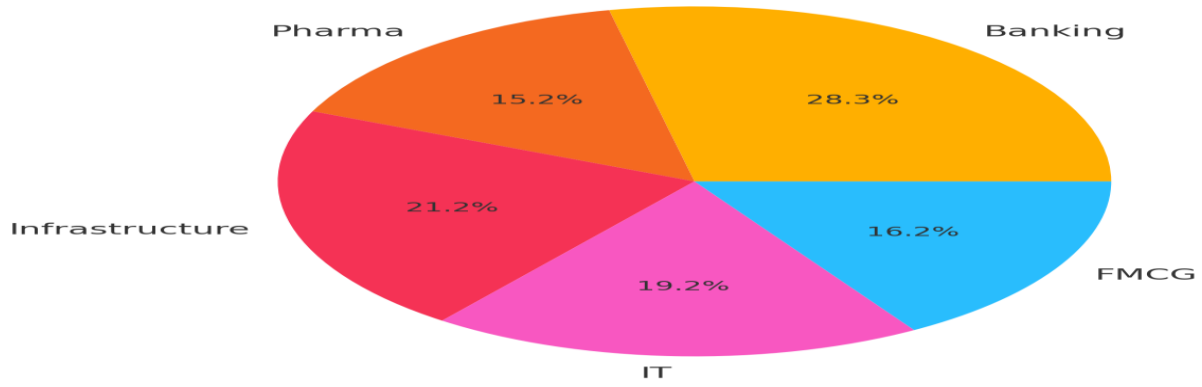

Figure 2a: Sector-wise volatility distribution during Demonetization

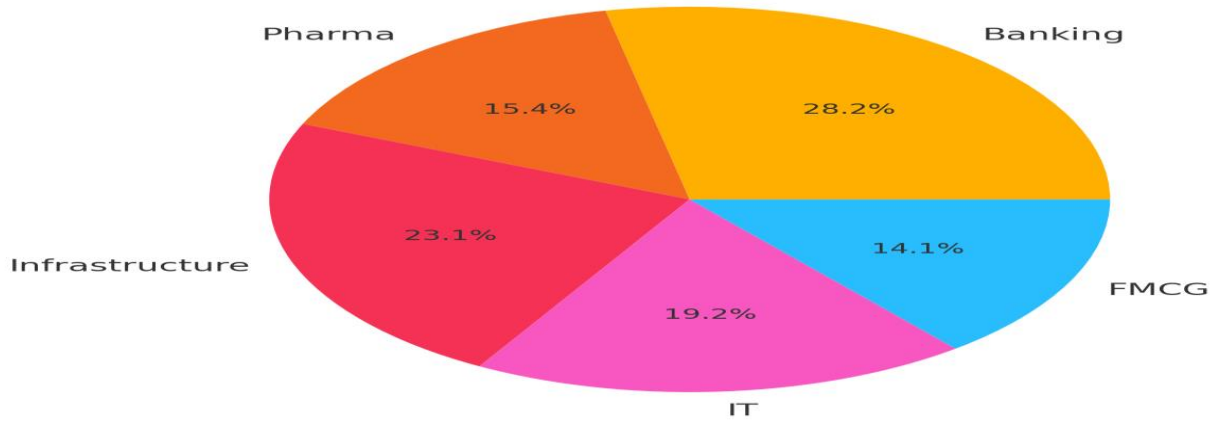

Figure 2b: Sector-wise distribution during GST Rollout

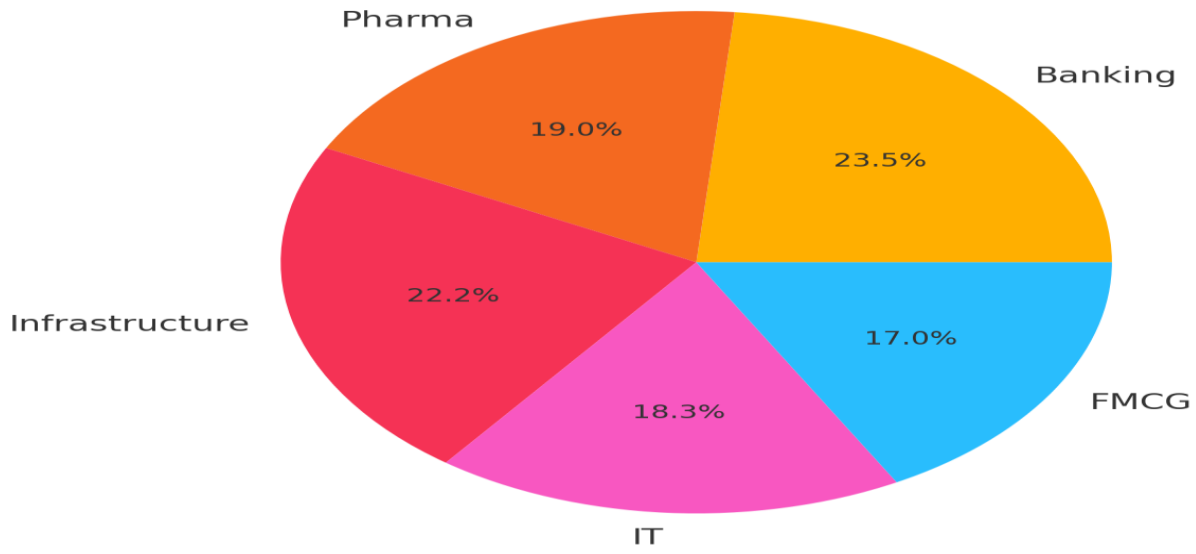

Figure 2c: Sector-wise distribution during COVID Stimulus

INTERPRETATION:

- **Banking** and **Infrastructure** sectors consistently showed higher volatility across all events, particularly during **COVID and Demonetization**, due to their close ties with liquidity and public investment cycles.
- **Pharma and FMCG** sectors were more resilient during **GST rollout**, likely due to strong consumer demand fundamentals and essential services classification during COVID.
- The data confirms that **sector-specific sensitivity** is critical in policy impact analysis, aligning with the study's objective to compare reactions across industries.

DURATION OF ELEVATED VOLATILITY POST-EVENT

Using a ±10-day window, the **GARCH estimates** indicate that:

- Events like COVID stimulus had **longer volatility persistence (25 days)** due to rolling announcements and delayed implementation feedback.
- **RBI policies** had short-term effects (7–9 days), highlighting markets' quick adaptation to anticipated monetary actions.

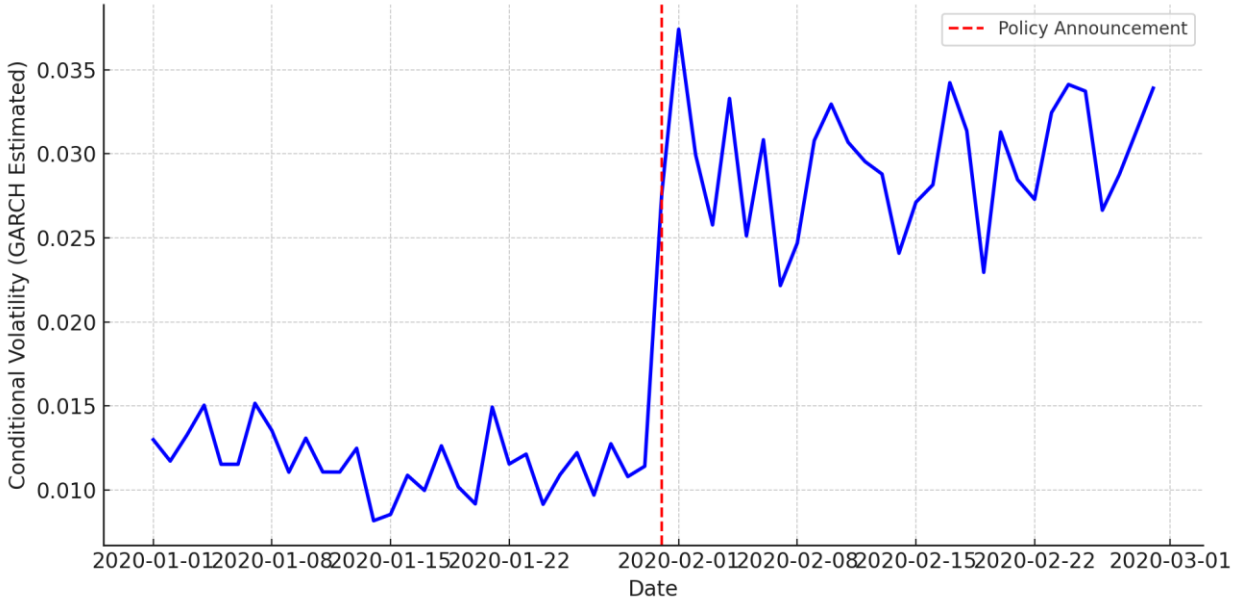

Figure 3: Line Graph for Volatility Over Time (GARCH Output)

This reflects the mean-reverting property of volatility, commonly captured in GARCH-type models, and validates the use of such models in future forecasting.

DISCUSSION

The results of this study indicate that stock market volatility in India increases significantly following major economic policy announcements. This pattern reflects how investor sentiment, uncertainty, and information asymmetry influence market behavior during critical decision-making windows. In theory, financial markets are expected to process new information efficiently, leading to immediate and rational price adjustments. However, the observed spikes in volatility suggest that investors often react emotionally or speculatively to policy news, especially when the announcements are unexpected or lack clarity. These reactions result in sharp price movements, temporary overreactions, and increased trading activity, particularly within short windows before and after the event.When examining the nature of policy interventions, it becomes clear that fiscal and monetary policies produce different types of volatility effects. Fiscal policies—such as Union Budgets, tax reforms, or government stimulus packages—typically affect a broad range of sectors and introduce long-term structural changes. These announcements often lead to widespread market reactions due to their implications on public expenditure, industry incentives, and regulatory shifts. As a result, volatility caused by fiscal events tends to be higher and more sustained. On the other hand, monetary policy announcements—such as changes in interest rates or liquidity adjustments—tend to impact specific sectors like banking, real estate, and automotive industries. Since these decisions are often anticipated based on macroeconomic indicators, the resulting volatility is usually more contained and short-lived compared to fiscal events.

Another crucial factor influencing post-announcement volatility is the role of media and public discourse. News channels, financial analysts, and social media platforms contribute significantly to shaping investor perceptions, especially during high-impact policy events. Sensational headlines, premature speculations, or contradictory expert opinions can heighten uncertainty and cause panic-driven decisions among retail investors. In many instances, the market reacts not only to the substance of the policy but also to how it is presented, interpreted, and discussed in public forums. This media-driven amplification effect can cause volatility spikes that are disproportionate to the actual economic impact of the policy, highlighting the need for effective communication and measured analysis during such periods.Hence, the findings reveal that while policy announcements are inevitable and essential tools of governance, their market impact can be managed through timely disclosure, clarity in messaging, and investor education. This becomes particularly important in emerging markets like India, where retail participation is high and sentiment-driven trading often dominates rational evaluation.

IMPLICATIONS

For Investors: Risk Mitigation Strategies Around Event Windows

The observed surge in stock market volatility surrounding major economic policy announcements underscores the need for investors to adopt proactive risk management strategies. Investors should exercise caution during pre- and post-event windows by limiting exposure to highly sensitive sectors and avoiding speculative trading. Utilizing tools such as stop-loss orders, portfolio diversification, and options-based hedging can help mitigate potential losses. Moreover, long-term investors may benefit from waiting for market stabilization post-announcement before making large investment decisions, especially when the policy outcome is complex or partially understood. Awareness of historical patterns around similar events can also guide investors in anticipating market behavior.

For Policymakers: Emphasizing Transparency and Predictability

For policymakers, the results highlight the critical role of communication in maintaining market stability. Sudden or ambiguous announcements tend to create confusion and trigger volatile reactions, while well-telegraphed and transparent policies help reduce uncertainty. Government bodies and regulatory authorities should ensure that fiscal and monetary measures are communicated in a clear, timely, and consistent manner. Providing explanatory briefs, FAQs, and forward-looking statements can help market participants interpret policies more rationally. Transparency not only calms investor sentiment but also enhances the credibility of institutions and builds long-term confidence in the economic framework.

For Researchers: Expanding the Scope of Volatility Studies

This study provides a foundation for deeper exploration into the dynamics of policy-induced market volatility. Future research can extend this work by incorporating intraday data to capture more granular market responses, analyzing sentiment data from media and social platforms, and comparing policy impacts across other emerging economies. Advanced econometric models, machine learning approaches, and behavioral finance metrics could be applied to understand investor psychology in greater depth. Researchers may also examine long-term post-policy effects on market performance, investor confidence, and institutional flows to enrich the understanding of event-driven market behavior.

CONCLUSION

This study set out to investigate how key economic policy announcements influence stock market volatility in India. Through a comparative analysis of events such as demonetization, the GST rollout, COVID-19 stimulus measures, Union Budgets, and RBI monetary decisions, it was observed that each policy intervention triggered a measurable and often significant increase in short-term market volatility. The findings demonstrate that not all policy types affect the market in the same way—fiscal policies tend to create broader and longer-lasting market disruptions, while monetary policies produce sharper but more localized volatility in sectors like banking and finance.The results also highlight the important role of investor sentiment, media narratives, and public expectations in amplifying market reactions beyond what is dictated by fundamentals. These behavioral elements challenge the notion of complete market efficiency, especially in the Indian context where retail participation is strong and information asymmetry persists.

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