

Indian Sectoral stock market reactions to fiscal events announcements and its market efficiency and volatility

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Abstract—This study investigates the impact of the Union Budget announcement on sectoral stock indices in India, focusing on volatility and return dynamics around the event. Utilizing the GARCH (1,1) model, the analysis captures volatility persistence and clustering across sectors, revealing heightened pre-announcement volatility and significant sectoral sensitivity, particularly in banking, automobiles, and consumer goods. The findings emphasize the importance of temporal and sector-specific risk assessment, offering valuable insights for investors and policymakers to enhance market stability and tailor risk management strategies during economically significant events.

I. INTRODUCTION

The Union Budget announcement is a pivotal event in the Indian financial calendar, often triggering significant market reactions across various sectors. This study examines the impact of the Union Budget announcement on the performance of sectoral stock indices in India over a specified period. Understanding these effects is crucial as the budget outlines government fiscal policies, taxation, and economic priorities that directly influence investor sentiment and sectoral risk profiles. By analyzing sector-specific volatility and returns around the budget announcement, this research aims to capture the dynamics of market behavior, highlighting how different industries respond to anticipated and actual policy changes. The use of advanced econometric models such as GARCH (1,1) facilitates a detailed investigation into volatility persistence and clustering, providing insights into risk management and

investment strategies tailored to sectoral characteristics.

II. LITERATURE REVIEW

The literature on stock market reactions to fiscal events and dividend announcements reveals diverse findings regarding market efficiency and volatility. Early foundational work by Fama et al. (1969) introduced event study methodology to analyze abnormal returns around significant corporate events, a method widely adopted in subsequent research.

Several studies focusing on dividend announcements in the Indian context show mixed results. Obaidullah (1990) concluded that Indian stock markets exhibit semi-strong efficiency regarding dividend announcements, while Neetu Mehndiratta and Shuchi Gupta (2010) found no significant abnormal returns before or on the event date but observed positive post-announcement effects. Contrarily, Mohammad Bayezid Ali and Tanbir Ahmed Chowdhury (2010) reported no significant market reaction, attributing this to insider trading. Similar observations of market inefficiency linked to information asymmetry between insiders and shareholders were made by Shaveta Gupta et al. (2012). Other studies (Md Lutfor Rahmon et al., 2012; Amit Balkrishna Joshi and Manas Mayur, 2017) highlighted nuanced stock price behaviors around dividend events, including negative returns prior to announcements and the dividend-signaling effect perceived positively by investors.

Regarding the impact of budget announcements on Indian stock markets, Varadharajan and Vikkraman

(2011) documented increased volatility and negative post-budget returns across major indices such as SENSEX and BSE 100 during 2002–2011. Kutchu (2012) found abnormal returns in selected sectoral indices following budget announcements, while S. Babu and M. Venkateswaralu (2013) noted that budget impacts were significant only up to fifteen days post-announcement. Joshi and Batra (2017) emphasized factors influencing investor perceptions, including P/E ratios, EPS, government policies, and macroeconomic variables like FII flows. Earlier research by Rao (1997) linked budget announcements to stock price instability, whereas Porwal and G. (2005) identified political instability and regulatory gaps as key drivers of volatility in the 1990s. Kalainathan (2018) extended this inquiry to the Sri Lankan market, finding significant budget-related effects but high market efficiency limiting abnormal returns.

Overall, the literature suggests that while event studies remain a robust tool for analyzing stock market reactions, the presence and magnitude of abnormal returns and volatility around dividend and budget announcements vary depending on market conditions, information asymmetry, regulatory environment, and investor behavior. The Indian stock market exhibits signs of both efficiency and inefficiency across different contexts and time frames, with fiscal events playing a notable role in shaping market dynamics.

III. RESEARCH METHODOLOGY

The study investigates the impact of the Union Budget announcement on the performance of sectoral stock indices in India over the period. Recognizing the Union Budget as a critical fiscal event that sets government spending, revenue policies, and economic priorities, the research explores how these announcements influence market dynamics, investor

sentiment, and speculative behavior, which collectively contribute to market volatility before and after the budget release. Focusing on fourteen sectoral indices of the NIFTY, the study employs an event study methodology with February 1, 2024, designated as the event date. The analysis covers a five-year window from January 1, 2020, to April 30, 2024, utilizing secondary data sourced from the NSE website. Returns for each stock are calculated using regression analysis based on daily closing prices, enabling the quantification of risk and return dynamics surrounding the budget announcement. The objectives include assessing the budget's effect on sectoral index returns, identifying causes of market volatility linked to the budget event, measuring abnormal returns through event study techniques, and determining which budgetary components (such as tax laws, government expenditure, and fiscal deficit targets) most significantly influence stock market performance. Additionally, the study examines behavioral and psychological factors affecting market reactions and evaluates the long-term impact of the budget announcement on investor confidence and overall market performance. The research addresses two hypotheses: the null hypothesis posits that sectoral indices are significantly impacted by the budget announcement, while the alternative hypothesis suggests no significant impact. Limitations include the focus solely on NSE sectoral indices, the defined study period (2020–2024), and the restriction to fourteen sectoral indices, which may limit the generalizability of findings. This comprehensive approach aims to provide valuable insights for investors, policymakers, brokerage firms, and students by elucidating how fiscal policy announcements affect market behavior, enabling more informed investment decisions and enhanced economic planning.

IV. DATA ANALYSIS AND INTERPRETATION

Table 1: Descriptive statistics output analysis for selected sectoral indices during pre and post budget announcement

	AUTO		FINANCIAL SERVICES		HEALTH CARE		IT		METAL		BANK	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Mean	0.431	-0.279	0.01	0.677	1.318	-0.751	0.335	-0.275	0.12	-1.489	0.084	0.618
Maximum	1.62	0.502	0.359	2.127	1.746	-0.241	0.999	0.251	1.019	-0.508	0.619	2.002
Minimum	-0.253	-1.374	-0.61	-0.231	1.09	-1.618	-0.725	-0.674	-1.2	-2.048	-0.454	-0.44

Std. Dev.	1.034	0.977	0.538	1.269	0.372	0.755	0.927	0.475	1.168	0.852	0.537	1.253
Skewness	0.684	-0.528	-0.69	0.642	0.703	-0.675	-0.641	0.458	-0.578	0.686	-0.009	0.445
Kurtosis	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Jarque-Bera	0.515	0.421	0.519	0.487	0.528	0.509	0.487	0.386	0.448	0.517	0.281	0.38
Probability	0.773	0.81	0.771	0.784	0.768	0.775	0.784	0.825	0.799	0.772	0.869	0.827

	COMMODITIES		CONSUMER GOODS		CAPITAL GOODS		ENERGY		TELE COMMUNICAT		UTILITIES	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Mean	-0.192	-0.204	0.564	0.707	0.068	0.514	-1.075	-0.718	0.173	0.929	-1.951	-1.754
Maximum	1.86	0.236	1.515	2.579	1.682	0.594	1.183	-0.408	2.057	3.361	2.172	-1.159
Minimum	-2.641	-0.673	-0.326	-0.75	-1.312	0.464	-3.089	-1.035	-2.223	-1.319	-5.907	-2.833
Std. Dev.	2.277	0.455	0.922	1.703	1.511	0.07	2.146	0.314	2.186	2.345	4.042	0.935
Skewness	-0.311	-0.117	0.12	0.421	0.278	0.634	0.206	-0.043	-0.407	0.143	0.076	-0.696
Kurtosis	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Jarque-Bera	0.33	0.288	0.288	0.37	0.32	0.482	0.302	0.282	0.364	0.291	0.284	0.523
Probability	0.848	0.866	0.866	0.831	0.852	0.786	0.86	0.868	0.834	0.864	0.868	0.77

V. INTERPRETATION:

The table 1 of descriptive statistics presents pre- and post-event summary measures for various sectoral indices, elucidating their return behavior in relation to the Union Budget announcement. Mean: The majority of sectors exhibit a decline in mean returns post-event compared to pre-event, indicating a generally negative market reaction following the budget announcement. Notable exceptions include the Healthcare sector (mean increases from 0.010 to 0.677) and Consumer Goods (0.564 to 0.707), suggesting that certain sectors experienced enhanced average returns post-budget. Maximum and Minimum: Maximum returns generally decline or remain volatile post-event in sectors such as Auto, Metal, Bank, and Utilities, indicating reduced upside potential or increased uncertainty. Minimum returns post-event tends to be more negative in several sectors (e.g., Auto: -0.253 pre to -1.374 post; Bank: -1.2 pre to -2.048 post), underscoring increased downside risk or volatility subsequent to the budget. Volatility, as measured by standard deviation, exhibits mixed patterns: Some sectors, such as Auto and Healthcare, show slight decreases post-event, indicating marginally reduced variability. Others, such as Energy and Utilities, display increased volatility post-event, reflecting heightened market uncertainty

or reaction. Commodities exhibit a marked reduction in volatility post-event (2.277 to 0.455), suggesting stabilization following the budget release. Skewness values fluctuate around zero, with some sectors showing positive skewness (e.g., Auto pre-event 0.684, Healthcare post-event 0.642), indicating a distribution with potential for higher positive returns. Negative skewness in sectors such as Bank and Metal post-event implies a tendency toward more frequent or extreme negative returns. Kurtosis values are consistently around 1.5 across sectors and periods, indicating moderate tails and a distribution close to normal, with no extreme outliers dominating the return distributions. Jarque-Bera statistics are low with high p-values (>0.05) across all sectors and periods, suggesting that return distributions do not significantly deviate from normality. Overall, the post-budget period generally witnesses increased downside risk and volatility in several sectors, reflecting market uncertainty and investor caution. Some sectors, such as Healthcare and Consumer Goods, show improved average returns post-event, possibly benefiting from budget allocations or investor sentiment. The normality tests imply that despite these changes, return distributions remain statistically normal, facilitating the use of parametric models in further analysis.

Table 2: GARCH (1,1) Output Analysis for Selected Sectoral Indices during Pre and Post Budget announcement

	AUTO	HEALTH CARE	IT	METAL	COMMODITIES	CONSUMER GOODS
Variable	Prob.	Prob.	Prob.	Prob.	Prob.	Prob.
Mean equation						
PRE	0.461	0.007	0.958	0.945	0.819	0.014
POST	0.08	0.14	0.744	0.633	0.698	0
Variance equation						
C	0	0.263	0.77	0.517	0.24	0.188
RESID (-1) ^2	0.053	0.196	0.019	0.001	0.115	0.001
GARCH (-1)	0	0.847	0	0	0.848	0
	CAPITAL GOODS	MANUFAC TURING	BANK	UTILITIES	ENERGY	TELE COMMUNICATION
Variable	Prob.	Prob.	Prob.	Prob.	Prob.	Prob.
Mean equation						
PRE	0.926	0.644	0.549	0.853	0.92	0.667
POST	0.792	0.629	0.993	0.904	0.892	0.428
Variance equation						
C	0.61	0.348	0.369	0.004	0.308	0.628
RESID (-1) ^2	0.561	0.614	0.335	0.179	0.863	0
GARCH (-1)	0.997	0	0.191	0.115	0	0

Interpretation: Table 2 A statistically significant correlation exists between the release of budget trading days and returns at the five percent significance level. GARCH (1,1) models are widely used in sectoral analysis to capture and interpret volatility dynamics in financial time series across different industries. The model estimates conditional variance based on past squared errors (ARCH term) and past variance (GARCH term), allowing sector-specific volatility clustering and persistence to be quantified.

Volatility Persistence: The sum of the ARCH coefficient (α) and the GARCH coefficient (β) indicates volatility persistence in a sector. A sum close to 1 implies that shocks to volatility are highly persistent, meaning that volatility tends to cluster and remain elevated for a prolonged period after a market disturbance. Different sectors may exhibit varying persistence levels depending on their inherent risk profiles and sensitivity to economic cycles.

Sector-Specific Risk Dynamics: High α (ARCH) coefficient: Suggests that recent shocks have a strong immediate impact on volatility. Sectors with rapid response to news or events, such as technology or energy, often show higher α values.

High β (GARCH) coefficient: Indicates that past volatility significantly influences current volatility, reflecting long memory effects. Defensive or stable sectors like utilities or consumer staples may show higher β , implying smoother volatility evolution.

Volatility Clustering: GARCH (1,1) captures volatility clustering, a common feature in financial returns where high-volatility periods are followed by high volatility and low-volatility periods follow low volatility. Sectoral differences in clustering can reveal how sensitive a sector is to macroeconomic or firm-specific shocks.

Risk Management and Forecasting:

By analyzing GARCH parameters across sectors, investors and risk managers can tailor volatility forecasts and risk measures (e.g., Value at Risk) to sectoral characteristics, improving portfolio allocation and hedging strategies.

Comparative Sectoral Insights:

Comparing GARCH (1,1) parameters across sectors highlights which industries are more volatile and how quickly volatility shocks dissipate. For instance, cyclical sectors like financials or industrials may exhibit higher volatility persistence and reaction to

shocks, while defensive sectors may have lower immediate volatility response but longer-lasting volatility effects.

VI. FINDINGS

- ✓ Empirical evidence indicates significant short-term volatility around the budget announcement period, with volatility levels higher prior to the announcement than afterward. This is likely due to reduced trading volumes and increased investor uncertainty during the lead-up to the event.
- ✓ Sectors such as banking, automobiles, and consumer goods exhibit notable provisions, suggesting these industries are particularly sensitive to budget-related developments.
- ✓ Both before and during the budget announcement, higher returns are generally associated with increased volatility, reflecting the market's reactive nature to anticipated and actual economic policies.
- ✓ The GARCH (1,1) model results confirm that past volatility significantly influences current market prices, evidencing volatility persistence and clustering in stock price fluctuations in response to economic events.

VII. SUGGESTIONS:

- ✓ Investors and portfolio managers should consider the heightened pre-announcement volatility when making trading decisions, possibly adopting more cautious or hedging strategies in sensitive sectors like banking and automobiles.
- ✓ Risk management frameworks should incorporate GARCH-based volatility forecasts to better capture the dynamics of sector-specific risk around major economic announcements.
- ✓ Policymakers and market analysts could benefit from monitoring sectoral volatility patterns to understand market expectations and reactions, thereby improving communication strategies to reduce uncertainty.
- ✓ Further empirical analysis could focus on quantifying the differential impact of budget announcements across sectors to refine investment and regulatory approaches.

VIII. CONCLUSION:

The analysis underscores the critical role of volatility dynamics in understanding market behavior surrounding budget announcements. The evidence of increased pre-announcement volatility and the persistence of shocks captured by the GARCH (1,1) model highlight the importance of temporal and sectoral considerations in financial decision-making. Sectors such as banking, automobiles, and consumer goods demonstrate pronounced sensitivity, necessitating tailored risk assessment and management strategies. Integrating these findings into investment and policy frameworks can enhance market stability and investor confidence during economically significant events.

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