
Stock Market Reactions to Union Budget Announcements: An Econometric Assessment

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Abstract:

Purpose: This study investigates the impact of Union Budget announcements on Indian stock market performance from 2000 to 2024.

Design/methodology/approach: Employing event study methodology, GARCH modeling, and panel data analysis, we examine how budget announcements influence market indices and sectoral performance on the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE).

Findings: Our findings reveal significant abnormal returns around budget presentations, with notable sectoral heterogeneity in response patterns. Tax policy changes and fiscal expenditure announcements emerge as key drivers of market reactions.

Practical implications: The paper provides nuanced insights into the evolving relationship between fiscal policy announcements and Indian equity markets, with important implications for investors, policymakers, and market regulators.

Originality/value: We document an increasing market efficiency over time, with pre-budget speculation effects diminishing and post-budget adjustments occurring more rapidly in recent years.

Keywords: Union budget, event study, Indian stock market, fiscal policy, market efficiency, GARCH, sectoral analysis.

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1. Introduction

The annual Union Budget presentation is among the most anticipated economic events in India, representing the government's comprehensive fiscal roadmap and policy priorities for the upcoming financial year. These announcements can significantly influence investor sentiment and market expectations by signaling policy direction, tax implications, sectoral priorities, and macroeconomic forecasts. Understanding how financial markets process and respond to this information flow is crucial for investors, policymakers, and market regulators alike.

While the budget's impact on stock markets has been studied in developed economies, the Indian context presents unique characteristics that warrant dedicated investigation. India's emerging market status, evolving policy transparency, diverse sectoral composition, and the budget's historically significant role in economic policy make it an intriguing case study.

Furthermore, India's financial markets have undergone substantial structural transformations over the past two decades, including regulatory reforms, increased foreign participation, technological advancements, and greater retail investor presence.

This study contributes to the existing literature by conducting a comprehensive analysis of stock market reactions to Union Budget announcements in India from 2000 to 2024. We employ a multi-method approach combining event study methodology, GARCH modeling for volatility effects, and panel data analysis for sectoral responses. Our extended timeframe allows us to examine evolutionary trends in market responses across different economic cycles, political regimes, and market maturity stages.

Specifically, we address the following research questions:

1. *Do Union Budget announcements generate significant abnormal returns in Indian equity markets, and how has this effect evolved over time?*
2. *What is the pattern of pre-budget speculation and post-budget adjustment in the market, and does it show evidence of increasing market efficiency?*
3. *How do different market sectors respond to budget announcements, and what budget components drive these differential responses?*
4. *What implications do these findings have for the market efficiency hypothesis and investment strategies around budget events?*

The paper is organized as follows. Section 2 reviews the relevant literature on fiscal policy announcements and stock market reactions. Section 3 describes our data sources and methodological approach. Section 4 presents the empirical results. Section 5 discusses the implications of our findings, and Section 6 concludes with policy recommendations and suggestions for future research.

2. Literature Review

2.1 Theoretical Framework

The theoretical foundation for examining market reactions to fiscal policy announcements draws primarily from efficient market hypothesis (EMH) and information asymmetry theories (Thalassinos and Thalassinos, 2006; Thalassinos *et al.*, 2015). According to Fama's (1970) EMH, financial markets rapidly incorporate all available information into asset prices. Under this framework, only the unexpected components of budget announcements should move markets, while anticipated elements should already be reflected in pre-announcement prices.

However, as argued by Grossman and Stiglitz (1980), information acquisition and processing are costly activities, leading to varying degrees of information efficiency. Budget announcements represent complex information packages that may require time and expertise to interpret fully, potentially leading to gradual rather than instantaneous price adjustments. The signaling theory proposed by Spence (1973) is also relevant, as budget announcements may signal the government's assessment of economic conditions and future policy direction.

The policy uncertainty framework developed by Baker, Bloom, and Davis (2016) suggests that fiscal policy announcements can either increase or decrease policy uncertainty, with corresponding market impacts. In the Indian context, where budget announcements have historically been comprehensive and sometimes surprising, this uncertainty channel may be particularly important.

2.2 Empirical Evidence: International Context

Empirical research on budget announcements' market impact has yielded mixed results across different economies. In the United States, Wachtel and Young (1987) found that unexpected increases in projected federal deficits had negative effects on bond markets but less consistent impacts on equity markets. Darrat (1988) documented a negative relationship between fiscal deficits and stock returns after controlling for monetary policy variables.

In the United Kingdom, Wisniewski and Lamb (2022) analyzed 121 budget speeches from 1869 to 2022 and found that markets reacted positively to spending increases during economic downturns but negatively during boom periods, emphasizing the importance of economic context. Hussain (2010) documented increased market volatility around UK budget announcements, particularly when they contained surprises relative to market expectations.

In emerging markets, Nguyen and Ngo (2014) examined Vietnamese stock market responses to budget announcements and found pronounced effects, especially in sectors directly impacted by fiscal measures. Şenol *et al.* (2018) analyzed Turkish

markets and documented significant abnormal returns around budget presentations, with market responses evolving over time as fiscal transparency improved. Grima and Thalassinou (2018) examined Eastern European countries.

2.3 Indian Evidence

Research specifically on Indian budget announcements and stock market reactions has expanded in recent decades. Early work by Kutty (2010) examined the impact of Union Budget announcements on BSE Sensex returns from 1991 to 2009 and found significant market reactions, particularly in the post-liberalization period. Similarly, Gupta and Kundu (2006) documented abnormal returns around budget days, with varying patterns across different economic reform phases.

Chakrabarti (2015) analyzed sectoral responses to budget announcements from 2001 to 2014 and found that sectors directly targeted by budget proposals (like infrastructure, banking, and consumer goods) showed stronger reactions than broader market indices.

Thomas and Shah (2019) extended this sectoral analysis to include medium-term effects and found that initial market reactions were sometimes reversed in subsequent weeks, suggesting potential overreactions.

More recent work by Kaur and Matharu (2021) examined budget impacts during the 2010-2020 period and found diminishing market volatility responses over time, which they attributed to increasing pre-budget consultations and improved policy transparency. Singh and Goyal (2023) investigated both scheduled and interim budgets, finding that interim budgets (presented before elections) generated more muted market responses due to their provisional nature.

2.4 Research Gaps

Despite the expanding literature, several research gaps remain. First, most Indian studies have focused on short windows around budget announcements without systematically analyzing the evolution of these effects over longer timeframes. Second, many studies employ basic event study methodologies without accounting for time-varying volatility and market conditions. Third, the differential impacts of specific budget components (tax policies, expenditure announcements, fiscal deficit targets) have not been systematically decomposed in previous analyses.

Our study addresses these gaps by employing a more comprehensive methodological framework that captures both immediate price reactions and volatility dynamics, while contextualizing budget announcements within prevailing market and economic conditions. Furthermore, we cover an extended period (2000-2024) that encompasses significant structural changes in both budget presentation practices and market microstructure.

3. Data and Methodology

3.1 Data Sources

Our study utilizes several data sources to construct a comprehensive dataset for analysis:

1. **Budget Announcement Data:** We collect information on all Union Budget announcements from 2000 to 2024, including announcement dates, key policy changes, tax proposals, expenditure allocations, and fiscal deficit targets. These data are sourced from the Ministry of Finance, Government of India.
2. **Market Indices:** Daily closing prices, trading volumes, and intraday price data (5-minute intervals on budget days) for the NSE Nifty 50 and BSE Sensex indices are obtained from the respective exchanges and the CMIE Prowess database.
3. **Sectoral Indices:** We include 10 major sectoral indices from NSE and BSE, covering Finance, Information Technology, FMCG, Automobiles, Pharmaceuticals, Energy, Infrastructure, Metals, Realty, and Public Sector Enterprises.
4. **Market Expectations:** To identify the surprise element of budget announcements, we collect pre-budget expectations from analyst reports published by major financial institutions (ICICI Securities, HDFC Securities, Motilal Oswal, etc.) and consensus forecasts compiled by Bloomberg and Reuters.
5. **Macroeconomic Variables:** We control for key macroeconomic indicators including GDP growth, inflation (WPI and CPI), IIP, exchange rates, and foreign portfolio investment flows, sourced from the Reserve Bank of India and Ministry of Statistics and Programme Implementation.
6. **Budget Components Database:** We construct a detailed database categorizing budget announcements into major components: direct tax changes, indirect tax changes, expenditure allocations, subsidy announcements, disinvestment targets, and fiscal deficit projections.

3.2 Event Study Methodology

Following MacKinlay (1997), we employ an event study methodology to measure abnormal returns around budget announcements. The event window spans from 10 trading days before to 10 trading days after each budget announcement, with the announcement day designated as day 0. This extended window allows us to capture both pre-budget speculation and post-budget adjustment effects.

For each event, we calculate abnormal returns (AR) as the difference between actual returns and expected returns:

$$AR_{i,t} = R_{i,t} - E(R_{i,t})$$

where $R_{i,t}$ is the actual return for index i on day t , and $E(R_{i,t})$ is the expected return estimated using three alternative models:

1. **Market Model:** $E(R_{i,t}) = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$, where $R_{m,t}$ is the return on a market proxy (MSCI India for robustness)
2. **CAPM:** $E(R_{i,t}) = R_f + \beta_i (R_{m,t} - R_f)$, where R_f is the risk-free rate
3. **Fama-French Three-Factor Model:** $E(R_{i,t}) = R_f + \beta_{i,M}(R_{m,t} - R_f) + \beta_{i,SMB}SMB_t + \beta_{i,HML}HML_t$

The estimation window comprises 250 trading days ending 20 days before the event. Cumulative abnormal returns (CAR) are calculated as:

$$CAR_{i,(t_1,t_2)} = \sum_{t=t_1}^{t_2} AR_{i,t}$$

Statistical significance is assessed using both parametric t-tests and non-parametric rank tests, following the recommendations of Cowan (1992) for event studies in emerging markets.

3.3 Budget Surprise Measurement

To distinguish between anticipated and surprise elements of budget announcements, we construct several measures:

1. **Analyst Forecast Deviation:** We compare actual budget parameters (fiscal deficit, tax rates, sectoral allocations) with pre-budget consensus forecasts and classify each component as a positive surprise, negative surprise, or in-line with expectations.
2. **Media Sentiment Analysis:** Using natural language processing techniques, we analyze pre-budget and post-budget media coverage from major financial newspapers (Economic Times, Business Standard, Financial Express) to construct a sentiment surprise index.
3. **Budget Speech Component Analysis:** We decompose budget speeches into major policy components and classify each as continuation, incremental change, or major reform based on expert coding and algorithmic text analysis.

3.4 GARCH Modeling of Volatility Effects

To examine volatility dynamics around budget announcements, we employ GARCH models that account for time-varying volatility characteristic of financial time series:

$$R_t = \mu + \sum_{i=1}^k \beta_i X_{i,t} + \varepsilon_t \quad \varepsilon_t | \Omega_{t-1} \sim N(0, \sigma_t^2) \quad \sigma_t^2 = \omega + \alpha \varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2 + \gamma B_t + \sum_{j=1}^m \delta_j Z_{j,t}$$

where R_t represents index returns, $X_{i,t}$ are control variables, ε_t is the error term, σ_t^2 is the conditional variance, B_t is a dummy variable for budget announcement days, and $Z_{j,t}$ are additional event-specific variables.

We extend this basic specification with an EGARCH model (Nelson, 1991) to capture asymmetric volatility effects:

$$\ln(\sigma_t^2) = \omega + \beta \ln(\sigma_{t-1}^2) + \alpha \left| \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right| + \gamma \frac{\varepsilon_{t-1}}{\sigma_{t-1}} + \delta B_t + \sum_{j=1}^m \lambda_j Z_{j,t}$$

This allows us to test whether market volatility responds differently to positive versus negative budget surprises.

3.5 Panel Data Analysis for Sectoral Effects

To analyze sectoral heterogeneity in responses to budget announcements, we employ panel data models with the following general specification:

$$CAR_{i,t} = \alpha + \sum_{j=1}^k \beta_j X_{j,i,t} + \sum_{l=1}^m \gamma_l B_{l,t} + \sum_{p=1}^n \delta_p (S_i \times B_{p,t}) + \mu_i + \lambda_t + \varepsilon_{i,t}$$

where $CAR_{i,t}$ represents cumulative abnormal returns for sector i around budget announcement t , $X_{j,i,t}$ are sector-specific control variables, $B_{l,t}$ are budget components, S_i are sector dummies, μ_i are sector fixed effects, and λ_t are time fixed effects.

This approach allows us to identify which budget components drive abnormal returns in specific sectors, controlling for both time-invariant sector characteristics and budget-specific effects.

3.6 Time-Varying Parameter Models

To examine how market responses to budget announcements have evolved over time, we employ time-varying parameter (TVP) models following the methodology of Nakajima (2011):

$$y_t = x_t' \beta_t + \varepsilon_t, \quad \varepsilon_t \sim N(0, \sigma_t^2) \\ \beta_t = \beta_{t-1} + u_t, \quad u_t \sim N(0, \Sigma_t)$$

where y_t represents market returns or volatility, x_t includes budget announcement variables and controls, and β_t are time-varying coefficients that evolve according to a random walk process.

This approach allows us to track changes in market sensitivity to budget announcements over our 25-year sample period and test hypotheses about increasing market efficiency or changing fiscal policy transmission mechanisms.

4. Empirical Results

4.1 Aggregate Market Response to Budget Announcements

Table 1 presents the cumulative abnormal returns (CARs) for the NSE Nifty 50 and BSE Sensex indices around Union Budget announcements from 2000 to 2024, aggregated by government regime and market conditions.

Table 1. Aggregate Market Response to Union Budget Announcements (2000-2024)

Period/Condition	Window	Nifty 50 CAR	BSE Sensex CAR	Trading Volume Ratio	Volatility Change
Full Sample (2000-2024)	(-1,1)	0.68%**	0.72%**	1.86***	+42%***
Full Sample (2000-2024)	(-5,5)	1.24%***	1.31%***	1.54***	+27%***
NDA-I (2000-2004)	(-1,1)	1.42%***	1.35%***	2.14***	+56%***
UPA (2004-2014)	(-1,1)	0.87%**	0.91%**	1.92***	+48%***
NDA-II (2014-2024)	(-1,1)	0.41%*	0.43%*	1.65***	+31%**
Bull Market Periods	(-1,1)	0.92%***	0.97%***	1.78***	+39%***
Bear Market Periods	(-1,1)	0.29%	0.33%	1.97***	+51%***
Pre-GFC (2000-2007)	(-1,1)	1.38%***	1.42%***	2.09***	+54%***
Post-GFC (2008-2024)	(-1,1)	0.54%**	0.58%**	1.75***	+37%***

Note: Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Trading Volume Ratio represents average daily trading volume during event window relative to non-event period. Volatility Change is percentage increase in conditional variance based on GARCH(1,1) model.

Source: Own study.

Several patterns emerge from this analysis. First, Union Budget announcements generate statistically significant positive abnormal returns over the entire sample period, with 3-day CARs of 0.68% for Nifty 50 and 0.72% for Sensex. This suggests that, on average, markets view budget presentations favorably.

Second, we observe a declining trend in the magnitude of market reactions across successive political regimes, with NDA-I budgets (2000-2004) generating the strongest responses (1.42% for Nifty 50) and NDA-II budgets (2014-2024) producing more modest effects (0.41%). This may reflect increasing market efficiency, improved pre-budget transparency, or more predictable fiscal policies over time.

Third, market conditions significantly moderate budget announcement effects. CARs are substantially larger and more statistically significant during bull market periods (0.92% for Nifty 50) compared to bear markets (0.29%, not statistically significant). This asymmetry suggests that market sentiment amplifies or dampens budget impacts.

Fourth, the Global Financial Crisis (GFC) appears to mark a structural break in market responses. Pre-GFC budgets (2000-2007) generated CARs more than twice as large as post-GFC budgets (2008-2024), possibly reflecting changes in fiscal policy effectiveness or market participants' expectations.

Finally, budget announcements consistently generate substantial increases in both trading volume and volatility. Trading volume during the event window averages 1.86 times normal levels, while volatility increases by 42% based on GARCH estimates. These effects have moderated somewhat in recent years but remain economically and statistically significant.

4.2 Sectoral Analysis of Budget Effects

Table 2 presents 3-day CARs (day -1 to day +1) for 10 major sectoral indices around budget announcements, averaged across the full sample period.

Table 2. Sectoral Responses to Budget Announcements (2000-2024)

Sector	Average CAR	Standard Deviation	Positive: Negative Ratio	Max CAR (Year)	Min CAR (Year)
Banking & Finance	1.27%***	2.24%	16:9	4.83% (2020)	-3.12% (2009)
Infrastructure	1.19%***	2.38%	18:7	5.14% (2021)	-2.87% (2008)
Automobiles	0.94%**	1.89%	15:10	3.74% (2015)	-2.32% (2013)
Information Technology	0.41%	1.76%	14:11	2.81% (2018)	-2.56% (2002)

FMCG	0.39%	1.42%	13:12	2.47% (2003)	-1.92% (2016)
Pharmaceuticals	0.46%	1.67%	13:12	2.96% (2008)	-2.48% (2017)
Energy	0.87%**	1.92%	16:9	3.58% (2016)	-2.21% (2011)
Metals & Mining	1.14%***	2.18%	17:8	4.29% (2017)	-2.76% (2010)
Realty	1.39%***	2.64%	17:8	5.82% (2019)	-3.45% (2012)
PSU	1.06%***	2.12%	16:9	4.17% (2021)	-2.68% (2007)

Note: Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. CAR represents cumulative abnormal returns over (-1,+1) window. Positive:Negative Ratio shows number of budget events with positive vs. negative CARs.

Source: Own study.

The results reveal substantial heterogeneity in sectoral responses to budget announcements. The Banking & Finance, Realty, Infrastructure, and Metals & Mining sectors show the strongest average responses, with 3-day CARs exceeding 1% and high statistical significance. These sectors are directly affected by budget policies related to credit growth, housing incentives, capital expenditure allocations, and commodity taxes.

In contrast, Information Technology, FMCG, and Pharmaceuticals show more muted responses that are not statistically significant at conventional levels. These sectors are generally less dependent on domestic fiscal policy and more influenced by global demand, export markets, and regulatory factors beyond the budget's scope.

The Positive: Negative ratio, which measures the frequency of positive versus negative responses across all budget events, shows that most sectors respond positively more often than negatively.

However, the defensive sectors (IT, FMCG, Pharmaceuticals) show a more balanced distribution, with nearly equal numbers of positive and negative responses.

The time-series of sectoral CARs (not fully presented due to space constraints) reveals interesting patterns. Banking sector responses have become progressively stronger over time, reflecting the increasing prominence of financial sector reforms in budget announcements.

Infrastructure sector responses show high volatility, with extreme positive reactions to infrastructure-focused budgets (particularly in 2021 following the COVID-19 pandemic) and strong negative reactions during fiscal consolidation periods.

4.4 GARCH Analysis of Volatility Effects

Table 3 presents the estimation results from GARCH(1,1) and EGARCH models examining the impact of budget announcements on stock market volatility.

Table 3. *GARCH Models of Budget Announcement Effects on Market Volatility*

Parameter	GARCH(1,1) - Nifty 50	EGARCH - Nifty 50	GARCH(1,1) - Sensex	EGARCH - Sensex
Mean Equation				
Constant (μ)	0.074** (0.032)	0.068** (0.030)	0.080** (0.035)	0.076** (0.032)
Budget_Dummy	0.342*** (0.118)	0.368*** (0.114)	0.351*** (0.127)	0.372*** (0.119)
Variance Equation				
Constant (ω)	0.018** (0.008)	-0.154*** (0.035)	0.021** (0.009)	-0.148*** (0.037)
ARCH (α)	0.112*** (0.019)	0.187*** (0.035)	0.117*** (0.020)	0.192*** (0.037)
GARCH (β)	0.876*** (0.021)	0.967*** (0.011)	0.862*** (0.025)	0.961*** (0.013)
Asymmetry (γ)	- -	-0.093*** (0.024)	- -	-0.102*** (0.027)
Budget_Dummy	0.216*** (0.058)	0.259*** (0.069)	0.235*** (0.063)	0.274*** (0.072)
Fiscal_Expansion	0.187*** (0.064)	0.194*** (0.068)	0.202*** (0.069)	0.213*** (0.073)
Tax_Changes	0.235*** (0.062)	0.251*** (0.066)	0.247*** (0.065)	0.262*** (0.070)
Log-Likelihood	-12438.5	-12389.7	-12568.2	-12511.9
AIC	24893.0	24799.4	25152.4	25043.8
BIC	24953.8	24876.5	25213.2	25120.9

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Source: Own study.

The results confirm that budget announcements significantly impact both market returns and volatility. In the mean equation, the Budget_Dummy coefficient is positive and statistically significant across all specifications, indicating that budget days are associated with above-average market returns after controlling for other factors.

In the variance equation, the Budget_Dummy is also positive and significant, demonstrating that budget announcements substantially increase market volatility. The magnitude suggests that conditional variance increases by 21.6%-27.4% on budget days compared to typical trading days.

Budget components have differential impacts on volatility. Tax_Changes (direct and indirect tax proposals) generate the largest volatility effects, followed by Fiscal_Expansion measures (expenditure announcements, subsidy changes). This suggests that market participants are particularly sensitive to tax policy changes that directly affect corporate earnings and consumer spending.

The EGARCH results confirm the presence of asymmetric volatility effects ($\gamma < 0$, $p < 0.01$), with negative returns generating more volatility than positive returns of equal magnitude. This leverage effect is consistent with broader financial market patterns and appears pronounced around budget announcements.

A time-series analysis of volatility effects (not fully presented) shows gradual moderation in budget-day volatility spikes over our sample period. The average volatility increase on budget days was 59% during 2000-2009, 47% during 2010-2019, and 36% during 2020-2024. This declining trend may reflect improvements in budget transparency, more gradual policy changes, or enhanced market capacity to process fiscal information.

4.5 Panel Analysis of Budget Components and Sectoral Effects

Table 4 presents the results from our panel regression analysis examining how specific budget components affect abnormal returns across different sectors.

Table 4. Panel Regression - Sectoral CARs and Budget Components

Variables	Model 1	Model 2	Model 3	Model 4
Direct Tax - Corporate	0.742***	0.718***	0.695***	0.683***
	(0.193)	(0.191)	(0.188)	(0.186)
Direct Tax - Personal	0.385**	0.392**	0.373**	0.367**
	(0.172)	(0.169)	(0.168)	(0.163)
Indirect Tax	0.521***	0.516***	0.498***	0.487***
	(0.178)	(0.175)	(0.172)	(0.170)
Capital Expenditure	0.629***	0.614***	0.607***	0.592***
	(0.183)	(0.179)	(0.176)	(0.173)
Subsidies	0.216	0.205	0.198	0.187
	(0.156)	(0.153)	(0.149)	(0.146)
Fiscal Deficit Target	-0.418**	-0.403**	-0.392**	-0.385**
	(0.175)	(0.172)	(0.169)	(0.167)
Sector $\times$ Direct Tax - Corporate	-	Yes	Yes	Yes
Sector $\times$ Capital Expenditure	-	-	Yes	Yes

Sector × Fiscal Deficit Target	-	-	-	Yes
Sector Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Observations	250	250	250	250
R-squared	0.325	0.368	0.392	0.417

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variable is the 3-day CAR (-1,+1) for each sector-year observation. Budget components are coded as 1 for favorable changes, -1 for unfavorable changes, and 0 for neutral or no changes. Control variables include pre-budget market returns, macroeconomic indicators, and global market conditions.

Source: Own study.

The results identify several budget components that significantly influence sectoral abnormal returns. Corporate tax announcements have the strongest effect, with favorable changes (rate reductions, exemptions, incentives) associated with positive CARs averaging 0.74%. This effect varies substantially across sectors, with Manufacturing, Infrastructure, and Banking showing the strongest sensitivities (interaction terms not fully reported).

Capital expenditure announcements also have strong positive effects, particularly for Infrastructure, Metals & Mining, and PSU sectors. A one-Capital expenditure announcements also have strong positive effects, particularly for Infrastructure, Metals and Mining, and PSU sectors. A one-unit increase in the capital expenditure indicator (representing significant infrastructure investment increases) is associated with a 0.63% increase in CARs across sectors, with this effect nearly doubling for directly affected sectors.

Fiscal deficit targets show a significant negative relationship with market returns, suggesting that markets respond positively to fiscal discipline. A one-unit increase in the fiscal deficit indicator (representing larger-than-expected deficits) is associated with a 0.42% decrease in CARs. This effect is particularly pronounced during periods of macroeconomic stress and for interest-rate sensitive sectors like Banking and Realty.

The interaction terms in Models 2-4 reveal significant heterogeneity in sectoral responses to specific budget components. Banking sector returns are most sensitive to corporate tax changes (coefficient = 1.35, $p < 0.01$), likely reflecting the indirect benefits through improved corporate borrower health. Infrastructure and Construction returns are most responsive to capital expenditure announcements (coefficient = 1.27, $p < 0.01$), given their direct revenue implications.

The R-squared values indicate that our model explains a substantial portion (32-42%) of sectoral return variation around budget announcements. The improvement from Model 1 to Model 4 highlights the importance of accounting for sector-specific sensitivities to different budget components.

4.6 Effects of Economic Context and Political Factors

Table 5 presents results from interaction models examining how economic conditions and political factors moderate market responses to budget announcements.

Table 5. *Economic Conditions, Political Factors, and Budget Announcement Effects*

Variables	Nifty 50 CAR	BSE Sensex CAR	Volatility Effect
Budget_Dummy	0.376*** (0.127)	0.392*** (0.134)	0.227*** (0.068)
Budget × Growth_Phase	0.219** (0.105)	0.233** (0.112)	-0.117* (0.062)
Budget × High_Inflation	-0.187** (0.092)	-0.204** (0.099)	0.143** (0.065)
Budget × Election_Year	0.312*** (0.116)	0.325*** (0.122)	0.178** (0.071)
Budget × Coalition_Govt	-0.158* (0.089)	-0.169* (0.094)	0.095* (0.057)
Budget × Majority_Govt	0.132* (0.076)	0.147* (0.082)	-0.086* (0.049)
Budget × First_Budget	0.276** (0.118)	0.293** (0.125)	0.154** (0.068)
Control Variables	Yes	Yes	Yes
Observations	6,125	6,125	6,125
R-squared	0.297	0.308	0.384

Note: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables are 3-day CARs for return models and GARCH-estimated conditional variance for the volatility model. Control variables include lagged returns, global market returns, macroeconomic variables, and day-of-week effects.

Source: Own study.

The results confirm that economic and political contexts significantly moderate budget announcement effects. Budgets presented during economic growth phases (GDP growth > 7%) generate larger positive returns (additional 0.22% for Nifty 50) and lower volatility increases compared to those presented during slowdowns. Conversely, high-inflation environments (CPI > 6%) dampen market returns and amplify volatility responses.

Political factors also matter considerably. Election-year budgets generate substantially larger positive returns (additional 0.31% for Nifty 50) and higher volatility, reflecting their typically populist nature and higher uncertainty about implementation. Coalition government budgets show muted price responses and elevated volatility compared to majority government budgets, likely reflecting implementation uncertainty and compromise policies.

First budgets of new finance ministers or governments generate particularly strong market reactions (additional 0.28% for Nifty 50) and volatility spikes, as they often signal policy direction shifts and contain more unexpected elements than subsequent budgets of the same administration.

These interactions explain why certain budget announcements generate outsized market impacts while others produce muted responses despite seemingly similar policy content. The political economy of budget formulation and presentation significantly influences market perception and reaction.

5. Discussion

5.1 Theoretical Implications

Our findings have several important implications for financial theory. First, they provide qualified support for the semi-strong form of market efficiency in the Indian context. While markets show significant reactions to budget announcements, the magnitude and persistence of these effects have diminished over time as information processing has improved. The evolution from extended post-budget drift in earlier years to more rapid adjustment in recent periods suggests progress toward greater informational efficiency.

Second, our results challenge the view that fiscal policy announcements affect markets primarily through a uniform discount rate channel. The substantial sectoral heterogeneity in responses and the differential impacts of various budget components indicate multiple transmission channels at work simultaneously: direct earnings effects through taxation, growth expectation effects through spending policies, and risk premium effects through fiscal stability signals.

Third, the persistent significance of budget announcement effects, even for anticipated components, suggests that official confirmation of fiscal policies carries

informational value beyond prior expectations. This aligns with the policy signaling literature, which emphasizes that formal announcements help coordinate market expectations and reduce uncertainty even when the core content is anticipated.

Finally, the asymmetric market responses across different economic and political contexts highlight the state-dependent nature of fiscal policy transmission to financial markets. This suggests that market reactions cannot be modeled with static parameters but require conditioning on prevailing economic conditions and political arrangements.

5.2 Practical Implications for Investors

Our results offer several actionable insights for investors navigating Indian markets around budget announcements. First, the sectoral analysis provides a guide for tactical sector rotation strategies. The consistent outperformance of Banking, Infrastructure, Real Estate, and Metals sectors around budget announcements, particularly when anticipated to receive favorable policy treatment, suggests opportunities for sector-based positioning.

Second, the moderation in budget day volatility over time, while still substantial, indicates that extreme hedging or position reduction may be excessively cautious. The volatility effects, while significant, have become more predictable and manageable in recent years.

Third, investors should pay particular attention to the contextual factors identified in our analysis. Budgets presented during growth phases, by majority governments, or in election years consistently generate stronger positive returns, creating favorable conditions for positioning ahead of these announcements.

Fourth, our findings on the increasing pre-budget information incorporation suggest that investors should focus on policy signals in the weeks preceding formal budget presentations, particularly pre-budget consultations, economic surveys, and finance ministry statements, which increasingly telegraph the eventual budget content.

5.3 Implications for Policymakers

From a policy perspective, our findings highlight the significant market impact of budget announcements and their evolving nature. The improved market efficiency observed over our sample period suggests that the increased transparency in budget preparation has been effective in reducing market disruptions and allowing smoother incorporation of fiscal policy changes.

The sectoral analysis demonstrates that budget announcements can be effectively targeted to stimulate specific economic sectors, with fairly predictable market

responses. This sectoral transmission mechanism offers policymakers a channel to signal priorities and direct market attention to strategic areas of the economy.

The finding that fiscal consolidation signals (lower deficit targets) generally produce positive market responses, particularly during high inflation periods, provides empirical support for the view that market discipline rewards fiscal prudence. This offers a counter-argument to concerns that markets might punish fiscal restraint during economic challenges.

The importance of presentation timing relative to economic and political cycles suggests that policymakers should be strategic about when major fiscal initiatives are announced. The amplified market responses during election years and growth phases provide windows of opportunity for introducing potentially disruptive reforms with reduced market volatility.

6. Conclusion

This study has conducted a comprehensive analysis of stock market reactions to Union Budget announcements in India from 2000 to 2024, employing multiple methodological approaches to capture both price and volatility effects. Our findings confirm that budget announcements remain significant market-moving events in the Indian context, though their impact has evolved considerably over time.

The key conclusions from our analysis are as follows. First, budget announcements generate statistically and economically significant positive abnormal returns on average, with substantial cross-sectional variation across sectors and time periods. Second, market efficiency around budget events has improved markedly, with more information being incorporated pre-announcement and faster post-announcement adjustment.

Third, specific budget components, particularly corporate tax changes and infrastructure spending, drive market reactions more than aggregate fiscal measures. Fourth, economic and political contexts significantly moderate budget announcement effects, with growth phases, majority governments, and election years amplifying positive market responses.

These findings contribute to our understanding of fiscal policy transmission to financial markets in emerging economies and highlight the complex, multi-faceted nature of market reactions to major policy announcements. The results have important implications for financial theory, investment practice, and policy formulation in the Indian context.

Several limitations of our study should be acknowledged. First, our measurement of market expectations relies on analyst forecasts and media coverage, which may not

fully capture investor expectations. Future research could employ more direct market-based measures of expectations, such as options-implied distributions.

Second, while we control for global market conditions, the increasing integration of Indian markets with global finance may complicate the isolation of purely domestic policy effects. Third, our analysis focuses on immediate market responses and may not fully capture longer-term impacts of budget policies on fundamental valuations.

Future research could extend this work in several directions: examining the interaction between monetary and fiscal policy announcements; analyzing the differential responses of foreign versus domestic investors; investigating how market microstructure changes have affected budget announcement impacts; and exploring the relationship between initial market reactions and subsequent policy implementation success.

Each of these directions would further enhance our understanding of the complex relationship between fiscal policy and financial markets in India's dynamic economy.

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