

# ANALYZING THE RESPONSES OF DEFENSE SECTOR STOCKS TO INTERIM UNION BUDGET ANNOUNCEMENT 2024: AN EVENT STUDY

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## Abstract

The interim union budget, the government's primary economic policy document, outlines the intended use of public funds to achieve policy objectives. Industries look forward to it as it can lead to significant changes, and stock markets also react to budget releases to some extent. The paper examines how the NSE's Defense Stocks are affected by the Interim Union Budget. The data was accumulated between 2023 and 2024 from the authorized NSE website. The impact is measured in terms of daily average returns in the pre-and post-budget periods of the top five contributors to the Nifty India Defense index. The statistical tools used include regression analysis and a one-sample t-test. The study found that the impact on defense sector stocks was attributed to factors other than budget announcements. This paper suggests that investors should not consider budget announcements as significant events and should focus on other market factors as well for trading and investing.

**Keywords:** Budget, interim, defense, event, returns, announcement, Nifty India, t-test

## Editorial Record

**First submission received:**  
July 29, 2024

**Accepted for publication:**  
August 22, 2024

## Cite this article

Goyal, T. (2024). Analyzing The Responses of Defense Sector Stocks to Interim Union Budget Announcement 2024: An Event Study. *Sachetas*, 3(3), 35-42.  
<https://sachetas.in/index.php/Sachetas/article/view/295>

## INTRODUCTION

The Interim Union Budget announcement is one of the most significant economic events in India, shaping fiscal policies and influencing various sectors. The budget in India is an annual financial statement that details the government's expected receipts and outlays for each fiscal year, which runs from April 1 to March 31. It must be presented to parliament each year (Singhvi, 2014). It contains proposals for reforms to laws pertaining to the financial industry, commerce, taxes, industry, and exchange rates, all of which could have a positive or negative effect on the stock market. The union budget, as defined by Article 112 of the constitution, is an annual financial statement of the government's projected receipts and outlays for a fiscal year that begins on April 1 and ends on March 31. The government releases its plan for the upcoming fiscal year, and it is a crucial instrument for the government to use its limited financial resources sustainably (Gakhar, Kushwaha & Ashok, 2015). The defense sector, given its strategic importance and substantial government funding, is particularly impacted by the budget allocations and policies outlined during this event. Investors and market analysts closely monitor budget announcements for insights that could affect the stock performance of companies within this sector. Market fluctuations are caused by a variety of causes, including company-specific, industry-specific, and macroeconomic influences. Among these, macroeconomic variables have an impact on the market's share prices for all companies (Gayathiri & Ganesamoorthy, 2018).

This study aims to analyze the impact of the Interim Union Budget on the Nifty India Defense Index, specifically focusing on the top five contributing companies: Hindustan Aeronautics Ltd., Bharat Electronics Ltd., Solar Industries India Ltd., Bharat Dynamics Ltd., and Cochin Shipyard Ltd. By examining the daily average returns before and after the budget announcement, the research seeks to determine the significance of any abnormal returns observed during this period. By utilizing the data for the years 2023 and 2024, this study employs regression analysis and one-sample t-tests to evaluate the effect of the budget announcement on stock returns. The insights from this research will help investors better understand the volatility and market dynamics associated with budget announcements, enabling them to make more informed and strategic investment choices. Further, this study provides a nuanced perspective on market reactions and investor behavior during this crucial economic event by highlighting the limited impact of the Interim Union Budget on defense stocks.

## LITERATURE REVIEW

In the past, numerous studies on the impact of budget announcements on the stock market have been carried out. Like, authors Saraswat and Banga (2012) examined how budget announcements impacted the Indian stock market from 1995 to 2010 using the S&P CNX Nifty index. They found that the effect was evident over a lengthy duration of 30 days, with average returns showing higher levels of volatility in comparison to long- and medium-term periods. Further, Singhvi (2014) investigated stock market volatility and measured before and after budget returns from 1996 to 2013 by considering various term durations. The results disclosed that the budget announcement had no effect during any of the periods. In the same vein, authors Gakhar, Kushwaha & Ashok (2015) measured the stock return's volatility over different periods by examining the effect of the union budget on the NSE's CNX and NIFTY index. According to the study's findings, budget events increase volatility in the near term but lessen it over time. Similarly, authors Gayathiri & Ganesamoorthy (2018) studied the impact of the 2018 union budget announcement event on Sensex stock performance and their study showed event and one pre- and post-event day had no discernible effect on the returns of Sensex businesses.

Contrary to the above, Kalainathan (2018) investigated the effects of budget events on Sri Lankan stock market indices and revealed that the events had a noteworthy influence during the window after the announcement. Furthermore, Sardana et al. (2019) examined the effects of union budget announcements on 31 companies listed on the BSE over a 41-day period and their study disclosed that the market was semi-strongly efficient over the event time even though the CAAR on the day of the event was substantial but not sustained. Comparably, Sathyanarayana & Gargesa (2019) examined the effects of the union budget announcement event on the Indian stock market. According to their study, there was some volatility, but the market quickly absorbed the information, indicating that the volatility was unaffected by the budget.

Likewise, Jha & Basnet (2020) used the event research methodology to observe how the Nepal Stock Exchange reacted to the budget announcement. Their study discovered that the announcement of the budget had a favorable impact on the stock returns of Nepali businesses. Similarly, in the study of Shafiq and Qureshi (2022), two industries—the pharmaceutical and automotive sectors—were observed to determine how the 10-year period (2011–2020) of Pakistani Union Budget announcements affected these industries' performance. The results indicate that while both sectors were doing well, the event had little effect. Moreover, equities in the pharmaceutical industry are more volatile than those in the auto industry. Furthermore Abinaya and Jagadeesan (2024) studied the how budget affects nifty 50 returns over a 10 year period by applying statistical tests and found out there was no rise in volatility.

## RESEARCH METHODOLOGY

### Research Design

This study utilizes the event study methodology to analyze the impact of the Interim Union Budget announcement on defense stocks and index. The design is quasi-experimental, as it will check the cause-and-effect relationship between budget announcements and defense sector stock returns volatility. The focus will be on observing the changes in key indicators before and after the event date, focusing impact on the event date. The daily closing prices of Hindustan Aeronautics Ltd., Bharat Electronics Ltd., Solar Industries India Ltd., Bharat Dynamics Ltd., Cochin Shipyard Ltd. and Nifty India Defense Index were collected from the official website of the National Stock Exchange of India.

### Hypothesis

**Alternative Hypothesis (H1):** The returns of Hindustan Aeronautics Ltd. and Nifty India Defense differ significantly.

**Alternative Hypothesis (H2):** The returns of Bharat Electronics Ltd. and Nifty India Defense differ significantly.

**Alternative Hypothesis (H3):** The returns of Solar Industries India Ltd. and Nifty India Defense differ significantly.

**Alternative Hypothesis (H4):** The returns of Bharat Dynamics Ltd. and Nifty India Defense differ significantly.

**Alternative Hypothesis (H5):** The returns of Cochin Shipyard Ltd. and Nifty India Defense differ significantly.

### Period of Study

The daily closing prices of the Nifty India Defense index, Hindustan Aeronautics Ltd., Bharat Electronics Ltd., Solar Industries India Ltd., Bharat Dynamics Ltd., and Cochin Shipyard Ltd. Data have been collected from the NSE website (<https://www.nseindia.com/>) for a period from 25<sup>th</sup> May 2023 to 29<sup>th</sup> Feb 2024.

1. The event date is 1<sup>st</sup> February 2024, as the budget was announced on this date.
2. The pre-event period is taken to be 10 days, a 10-day pre-event window allows us to capture the market's anticipation and expectations leading up to the Interim Union Budget announcement. This period is crucial as market participants often react to rumors, speculations, and early indicators related to significant events.

- The post-event period is taken to be 10 days, a 10-day post-event window enables us to assess the immediate impact of the Interim Union Budget announcement on stock prices or other variables of interest. This period is essential for observing market reactions, price movements, and investor sentiment following the event.
- Regression analysis is performed on stock returns (dependent variable) and index returns (independent variable).
- The estimation window is 150 days from 29<sup>th</sup> May 2023 to 2<sup>nd</sup> Jan 2024, which is 10 days before the pre-event window, as the budget news influences the market even before the pre-event window, therefore, the estimation window is set as above.

### Methodology

- The daily logarithmic returns have been calculated to estimate daily stock returns and index returns.
- Subsequently the expected returns and abnormal returns are calculated using the market model.  

$$R_i = \alpha + \beta * R_m + \epsilon$$

$$AR = R_i - ER$$
- One sample T-test is applied using SPSS to the AR values of the event period of 17<sup>th</sup> Jan-15<sup>th</sup> Feb (21 days) to check the significance level.
- If Significance level > 0.05, there is no significant impact, i.e., reject the alternate hypothesis. If Significance level < 0.05, there is a significant impact, i.e., accept the alternate hypothesis.

## DATA ANALYSIS

### Regression Analysis

Table 1 represents the alpha, beta, f values and significant f values for the estimation window of all 5 companies to determine whether the observed relationship between dependent and independent variables is statistically significant for further study. In the regression table for the five companies, the f-value is much lower than the significance level of 0.05. Therefore, the values of  $\alpha$  and  $\beta$  are significant and can be used for further study.

**Table 1:** Regression Analysis Table

Company	Alpha	Beta	F	Significance F
Hindustan Aeronautics Ltd.	-0.005	1.311	15.31	0.00**
Bharat Electronics Ltd.	0.000	0.838	138.67	0.00**
Solar Industries India Ltd.	0.001	0.618	32.68	0.00**
Bharat Dynamics Ltd.	-0.001	1.288	166.87	0.00**
Cochin Shipyard Ltd.	0.000	1.807	164.52	0.00**

Source: Author's compilation

Table 2 presents the abnormal returns of Hindustan Aeronautics Ltd. for the 21 days of event period which reflect the stock's performance relative to its expected return.

**Table 2:** Abnormal Returns of Hindustan Aeronautics Ltd.

Event Period	Date	AR
-10	17-01-2024	-0.0042805
-9	18-01-2024	0.0063364
-8	19-01-2024	0.01313829
-7	20-01-2024	-0.0043351
-6	23-01-2024	0.00586348
-5	24-01-2024	0.01213462
-4	25-01-2024	-0.0032109
-3	29-01-2024	0.02477661
-2	30-01-2024	0.01590879
-1	31-01-2024	-0.0068894
Event date	01-02-2024	0.01205646
1	02-02-2024	-0.0058293
2	05-02-2024	-0.0007816
3	06-02-2024	0.0060685

4	07-02-2024	-0.0013068
5	08-02-2024	0.02094348
6	09-02-2024	-0.0024415
7	12-02-2024	0.02028136
8	13-02-2024	0.01550868
9	14-02-2024	0.00039238
10	15-02-2024	0.01841868

Source: Author's compilation

Table 3 displays the findings of one sample t-test conducted using SPSS to the abnormal returns of Hindustan Aeronautics Ltd. The calculated p-value 0.006 is less than the significance level. Therefore, the H1 is accepted and the event does have a significant impact.

**Table 3.** One-Sample Test

	t	Df	Sig. (2-tailed)
Abnormal Returns	3.084	20	0.006

Source: Author's compilation

Table 4 presents the abnormal returns of Bharat Electronics Ltd. for the 21 days of event period which reflect the stock's performance relative to its expected return.

**Table 4:** Abnormal Returns of Bharat Electronics Ltd.

Event Period	Date	AR
-10	17-01-2024	-0.0049923
-9	18-01-2024	0.01203192
-8	19-01-2024	0.01103758
-7	20-01-2024	0.00645268
-6	23-01-2024	-0.0081004
-5	24-01-2024	0.00653391
-4	25-01-2024	0.00272746
-3	29-01-2024	0.00258497
-2	30-01-2024	-0.0169232
-1	31-01-2024	-0.0159648
Event date	01-02-2024	-0.0090887
1	02-02-2024	0.0048929
2	05-02-2024	-0.0125375
3	06-02-2024	0.0030924
4	07-02-2024	-0.010283
5	08-02-2024	-0.0045414
6	09-02-2024	-0.0001046
7	12-02-2024	0.00180345
8	13-02-2024	0.00039125
9	14-02-2024	0.01700873
10	15-02-2024	0.01765704

Source: Author's compilation

Table 5 displays the findings of one sample t-test conducted using SPSS to the abnormal returns of Bharat Electronics Ltd. The calculated p-value 0.937 is more than the significance level. Therefore, the H2 is rejected and the event does not have a significant impact.

**Table 5.** One-Sample Test

	t	Df	Sig. (2-tailed)
Abnormal Returns	0.080	20	0.937

Source: Author's compilation

Table 6 presents the abnormal returns of Solar Industries India Ltd. for the 21 days of event period which reflect the stock's performance relative to its expected return.

**Table 6:** Abnormal Returns of Solar Industries India Ltd.

Event Period	Date	AR
-10	17-01-2024	-0.0275599
-9	18-01-2024	0.01747642
-8	19-01-2024	-0.0038457
-7	20-01-2024	-0.0035276
-6	23-01-2024	0.00446795
-5	24-01-2024	-0.0375285
-4	25-01-2024	-0.0186978
-3	29-01-2024	-0.0142429
-2	30-01-2024	-0.0156621
-1	31-01-2024	0.0107027
Event date	01-02-2024	-0.0160718
1	02-02-2024	0.01447208
2	05-02-2024	0.02937746
3	06-02-2024	0.00964216
4	07-02-2024	0.02274776
5	08-02-2024	-0.0168355
6	09-02-2024	0.01248349
7	12-02-2024	0.01138339
8	13-02-2024	0.00944014
9	14-02-2024	0.00413486
10	15-02-2024	-0.0426462

Source: Author's compilation

Table 7 displays the findings of one sample t-test conducted using SPSS to the abnormal returns of Solar Industries India Ltd. The calculated p-value 0.583 is more than the significance level. Therefore, the H3 is rejected and the event does not have a significant impact.

**Table 7.** One-Sample Test

	t	Df	Sig. (2-tailed)
Abnormal Returns	-0.558	20	0.583

Source: Author's compilation

Table 8 presents the abnormal returns of Bharat Dynamics Ltd. for the 21 days of event period which reflect the stock's performance relative to its expected return.

**Table 8:** Abnormal Returns of Bharat Dynamics Ltd.

Event Period	Date	AR
-10	17-01-2024	0.00655008
-9	18-01-2024	-0.0199781
-8	19-01-2024	-0.0075469
-7	20-01-2024	0.00529717

-6	23-01-2024	0.00359673
-5	24-01-2024	0.0135119
-4	25-01-2024	-0.0168157
-3	29-01-2024	-0.000114
-2	30-01-2024	0.0164881
-1	31-01-2024	-0.0032872
Event date	01-02-2024	0.00709654
1	02-02-2024	0.03147762
2	05-02-2024	0.00979981
3	06-02-2024	-0.0116174
4	07-02-2024	-0.0007939
5	08-02-2024	0.0552303
6	09-02-2024	-0.0027528
7	12-02-2024	-0.0722961
8	13-02-2024	-0.0338154
9	14-02-2024	0.01272185
10	15-02-2024	0.01399842

Source: Author's compilation

Table 9 displays the findings of one sample t-test conducted using SPSS to the abnormal returns of Bharat Dynamics Ltd. The calculated p-value 0.953 is more than the significance level. Therefore, the H4 is rejected and the event does not have a significant impact.

**Table 9.** One sample test

	t	Df	Sig. (2-tailed)
Abnormal Returns	0.059	20	0.953

Source: Author's compilation

Table 10 presents the abnormal returns of Cochin Shipyard Ltd. for the 21 days of event period which reflect the stock's performance relative to its expected return.

**Table 10:** Abnormal Returns of Cochin Shipyard Ltd.

Event Period	Date	AR
-10	17-01-2024	0.07220904
-9	18-01-2024	0.01606593
-8	19-01-2024	-0.0081231
-7	20-01-2024	-0.0025167
-6	23-01-2024	0.02432018
-5	24-01-2024	-0.0071345
-4	25-01-2024	0.02455853
-3	29-01-2024	-0.0211275
-2	30-01-2024	0.0192368
-1	31-01-2024	0.02641634
Event date	01-02-2024	0.00911319
1	02-02-2024	-0.0102687
2	05-02-2024	-0.0070853
3	06-02-2024	-0.018355
4	07-02-2024	-0.0174442
5	08-02-2024	-0.0040043
6	09-02-2024	0.01691049
7	12-02-2024	-0.0146637

8	13-02-2024	0.02253399
9	14-02-2024	-0.0178411
10	15-02-2024	0.00301661

Source: Author's compilation

Table 11 displays the findings of one sample t-test conducted using SPSS to the abnormal returns of Cochin Shipyard Ltd. The calculated p-value 0.314 is more than the significance level. Therefore, the H<sub>5</sub> is rejected and the event does not have a significant impact.

**Table 11.** One-Sample Test

	t	Df	Sig. (2-tailed)
Abnormal Returns	1.033	20	0.314

Source: Author's compilation

## DISCUSSION

The results indicate that only Hindustan Aeronautics Ltd. (HAL) exhibited significant abnormal returns in the event window surrounding the budget announcement. In contrast, the other four companies in the study—Bharat Electronics Ltd., Solar Industries India Ltd., Bharat Dynamics Ltd., and Cochin Shipyard Ltd.—did not show significant changes in their stock returns when compared with the Nifty India Defense index. This lack of significance implies that the budget announcement did not contain substantial information that directly impacted these companies and that the market had already priced in the budget's effects on these stocks. The reason for significant impact on HAL may be due to budget announcement but majorly because of other market factors such as dividend declaration, deals with government agencies, clients, etc.

Table 12 shows whether p values of abnormal returns of defense sector companies are significant by measuring it with the significance level of 0.05.

**Table 12:** Significance of Abnormal Returns

Company	P value of Abnormal Return	Significant/Insignificant
Hindustan Aeronautics Ltd.	0.006 < 0.05	Significant
Bharat Electronics Ltd.	0.937 > 0.05	Insignificant
Solar Industries India Ltd.	0.583 > 0.05	Insignificant
Bharat Dynamics Ltd.	0.953 > 0.05	Insignificant
Cochin Shipyard Ltd.	0.314 > 0.05	Insignificant

Source: Author's compilation

## CONCLUSION

This study investigated the impact of the Interim Union Budget announcement on February 1, 2024, on the stock returns of companies within the Nifty India Defense Index. The main objective was to determine whether there are significant differences in the abnormal returns of Hindustan Aeronautics Ltd. (HAL), Bharat Electronics Ltd., Solar Industries India Ltd., Bharat Dynamics Ltd., and Cochin Shipyard Ltd. with the Nifty India Defense index concerning the budget announcement. The findings revealed that only Hindustan Aeronautics Ltd. (HAL) exhibited statistically significant abnormal returns following the budget announcement, indicating a pronounced market reaction. In contrast, the results for Bharat Electronics Ltd., Solar Industries India Ltd., Bharat Dynamics Ltd., and Cochin Shipyard Ltd. did not show significant changes in stock returns, implying that the budget announcement did not materially influence these stocks within the observed event window. In conclusion, while the Interim Union Budget has a uniform intent, it does not have a significant impact on the defense sector. Returns of the defense sector do not show any significant impact of the event. Therefore, investors can make very less abnormal gains and the market constantly adjust itself with new information. In light of the findings, it is recommended that traders use insights from this paper to craft their strategies around budget event. Investors are advised to also take other factors into account and not view the budget releases alone as a major event.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

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