Research Article

A Study On The Impact Of Budget On Indian Stock Market Returns (With Special Reference To Nifty 50)

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ARTICLE INFO	ABSTRACT
	The research study focuses on the analysis of how the budget affects the Nifty 50 index. The daily average returns and the volatility of returns over a ten-year period (2014–2023) have been used to measure the impact of the budget. During the Pre-budget and Post-budget periods, the study time is divided into three categories: short term (5 days), medium term (15 days), and long term (30 days). To determine the impact of the budget and the volatility of returns, statistical tests like the t-test and F-test have been applied to the returns of the nifty 50. As a result the post-budget period has not seen a rise in volatility as the time period moves on. The choice of investors to make investments in the stock market during the budgetary period is regarded as a riskier move in comparison to other periods.
	Keywords: Budget, Nifty 50, Return, Stock market, Volatility.

Introduction

A nation's stock market index is believed to serve as an indicator of its economic health in the contemporary economic climate. This occurs as a result of an improving nation's economy, businesses investing more capital and increasing industrial demand, which raises the consumption of a wide range of commodities. As a result, there is increase in the corresponding companies net earnings, this raises the value of their shares and is represented in the index.

The stock market is unable to anticipate the impact of some events that will undoubtedly occur with absolute certainty because of their inherent nature. One such event is the yearly budget, which is typically presented in February by the Indian Parliament. The Government may maintain strong control over the nation's financial resources by using a budget. It includes recommendations for adjustments to trade, industrial, exchange rate, and direct and indirect tax laws, as well as financial sector reforms that could have a positive or negative effect on the stock market.

Review of literature

Arindam Gupta and Debashis Kundu (2006) examined the returns and volatility of the sensex when analysing the union budget's effect on the stock market. They discovered that the budget has the greatest effect in the short term post-budget, as opposed to the medium and long term average returns. They also discovered that volatility in a post-budget scenario typically does not rise with the lengthening of the period.

Sabnavis (2005) looked at how the Sensex was affected by a range of conflicts over politics, natural calamities, and economic crises between 1991 and 2005. In the instance that a negative impact occurred, the study also recorded the turnaround time for each incident. It was discovered that Sensex migrations were not significantly impacted by economic events or natural disasters. But political events like the prime minister's resignation or the attack on parliament had a far greater impact on the Sensex.

Kaur (2004) investigated the Indian stock market's month effect. Although they did not discover a January effect in the Indian stock market, they did discover that March and September produced significantly lower returns, while February and December produced significantly higher returns. They came to the conclusion that February was one of the most volatile months in both the NSE and BSE cases when compared to April and March. This assumption resulted from the budget release made in that particular month.

Objectives of the study

➢ To study the impact of budget announcement on Nifty 50 returns during the study period.
➢ To examine the daily return variance in the Nifty 50 and compare the returns of long-term, medium-term and short-term period during the budget announcement.

Hypothesis

H_0 – There is no significant impact of budget announcements on Nifty 50 returns for the study period.
H_1 – There is a significant impact of budget announcements on Nifty 50 returns for the study period.

Methodology

This study is based on secondary data. The National Stock Exchange website, books, and various other websites are sources of secondary data. During the ten-year study period, from 2014 to 2023, the effect of the budget announcement on the Indian stock market is examined. In the analysis, number of statistical formulae and mathematical tools was taken into consideration. The tools used for the study are t-test for analysing the average returns of Nifty 50 and F-test for comparing the variances of stock price returns during the pre-budget and post-budget announcements. The statistical formulae used in the study are:

1. The share price data of one year is used to calculate the security return, which is computed using the formula:

$$I_r = \left(\frac{C_t - C_{t-1}}{C_{t-1}}\right)$$

Where,
I_r = Rate of return of the individual automobile company.
C_t = Current day's closing price of individual automobile security.
C_{t-1} = Previous day's closing price of individual automobile security.

2. The rate of return in the Nifty index is calculated using the following formula:

$$M_r = \left(\frac{N_t - N_{t-1}}{N_{t-1}}\right)$$

Where,
M_r = Rate of return on Nifty index.
N_t = Current day's closing price on Nifty index.
N_{t-1} = Previous day's closing price on Nifty index.

3. A standard deviation is used to evaluate how estimates for a group of observations differ which is computed using the following formula:

$$SD = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \mu)^2}$$

Where,
σ = Population standard deviation symbol
μ = Population mean
N = total number of observations

Period of study

Pre-Budget	Pre-Budget	Pre-Budget	Budget Day	Post-Budget	Post-Budget	Post-Budget
30 days (X_1)	15 days (X_2)	5 days (X_3)	Event day (Z)	5 days (Y_3)	15 days (Y_2)	30 days (Y_1)

Two F-test analysis have been conducted with the above stated study period:
➢ Initially, a comparison is made among the variances in returns during the long term, medium term, and short term periods after the budget announcement. The comparison is made as follows: Y_1 and Y_2, Y_2 and Y_3 & Y_1 and Y_3 are analysed.
➢ Secondly, each post-budget period is compared to the variance of returns with the long-term pre-budget period (X_1). The comparison is made as follows: X_1 and Y_1, X_1 and Y_2 & X_1 and Y_3 are analysed.

Analysis and interpretation

The average daily returns of the Nifty 50 for the specified study period are displayed in the table 1. According to the study's estimation, the impact of the budget discharge is highest in the short term, reduces in the medium term, and then diminishes even more in the long term when compared to the pre-budget period.

Table 1: Daily Average Returns in Nifty 50

YEAR	Pre 30 days (X_1)	Pre 15 days (X_2)	Pre 5 days (X_3)	Post 5 days (Y_3)	Post 15 days (Y_2)	Post 30 days (Y_1)
2023	-0.00139	-0.00110	-0.00558	0.00291	-0.00021	-0.00119
2022	0.00192	-0.00154	0.00498	-0.00350	-0.00177	-0.00102
2021	0.00138	-0.00018	-0.00097	0.01146	0.00187	0.00152
2020	-0.00166	-0.00367	-0.00761	0.00741	0.00100	-0.00850
2019	0.00047	-0.00005	0.00040	-0.00437	-0.00301	-0.00228
2018	0.00173	0.00238	-0.00124	-0.00806	-0.00321	-0.00287
2017	0.00255	0.00339	0.00566	0.00121	0.00160	0.00167
2016	-0.00153	-0.00308	0.00659	-0.00502	0.00305	0.00188
2015	0.00160	0.00187	0.00338	-0.00323	-0.00264	-0.00070
2014	0.00154	0.00028	-0.00380	0.00196	0.00034	0.00149

Source: Calculated by the Researcher

In the analysis of long term average returns there are seven out of ten events which have positive pre-budget returns and four out of ten events which have positive post-budget return. In medium term average returns there are four out of ten events which have positive pre-budget returns and five out of ten events which have positive post-budget return. In short term average returns there are five out of ten events which have positive pre-budget and post-budget returns. All the stated periods have major fluctuations with both negative and positive returns during long term, medium term and short term period. For further analysis the selected years are segregated into two i.e. recent five years (2019-2023) and former five years (2014-2018).

In recent five years (2019-2023), the 2021 budget shows positive returns in both long term pre-budget & long term post-budget periods. It shows a good fluctuation from short term (-0.00097) with negative returns to medium (-0.00018) and long term (0.00138) with positive returns in pre-budget period. In post-budget period it has positive returns in short term (0.01146) then to medium term (0.00187) and ends up in the long term (0.00152). This demonstrates that, despite being adequate in the short term, the budget had long-term effects on the economy.

In former five years (2014-2018), the 2017 budget shows positive returns for all the stated terms in both pre-budget and post-budget period. The returns has also increased gradually from long term to short term in pre-budget period and in post-budget period the returns increased from short term to long term. This suggests that budgetary constraints have obvious long-term effects.

Table 2: Paired sample t-test

Result	X_1 & Y_1	X_1 & Y_2	X_1 & Y_3	X_2 & Y_1	X_2 & Y_2	X_2 & Y_3	X_3 & Y_1	X_3 & Y_2	X_3 & Y_3
Actual Value	1.926	0.952	0.282	0.842	0.108	-0.111	0.944	0.286	0.035
P-Value	0.043*	0.183	0.392	0.211	0.458	0.457	0.185	0.391	0.487

Note: * H_0 is rejected i.e., Significant at 5% level only ($P<0.05$).

It is obvious from the table 2 that long-term effects of the budget are greatest in which the alternative hypothesis is accepted in the scenario of comparing long term pre-budget and long term post-budget. In the case of both medium term and short term, no alternative explanation has been accepted during the pre-budget and post-budget period.

According to this, the medium-term and short term pre-budget & post-budget period has no impact at all, while the long-term pre-budget & post-budget period having the greatest effect. The long term has the biggest impacts on average returns during the post-budget period, followed by the medium term and the short term, which have some effect on returns. The null hypothesis H_0 has been rejected. Therefore there is a significant impact of budget announcements on Nifty 50 returns for the study period in the case of long term.

Table 3: Variance of Returns in Nifty 50

YEAR	Pre 30 days (X_1)	Pre 15 days (X_2)	Pre 5 days (X_3)	Post 5 days (Y_3)	Post 15 days (Y_2)	Post 30 days (Y_1)
2023	0.00006	0.00004	0.00007	0.00006	0.00005	0.00006
2022	0.00009	0.00012	0.00010	0.00013	0.00020	0.00029
2021	0.00019	0.00028	0.00075	0.00008	0.00012	0.00016
2020	0.00007	0.00007	0.00013	0.00010	0.00010	0.00044
2019	0.00006	0.00005	0.00005	0.00011	0.00006	0.00007
2018	0.00002	0.00002	0.00002	0.00016	0.00009	0.00008
2017	0.00006	0.00006	0.00012	0.00001	0.00002	0.00002
2016	0.00017	0.00022	0.00023	0.00012	0.00017	0.00013
2015	0.00007	0.00008	0.00010	0.00012	0.00007	0.00008
2014	0.00008	0.00008	0.00011	0.00011	0.00007	0.00006

Source: Calculated by the Researcher

Table 3 states the variance of returns in Nifty 50. A brief glance at it reveals that, in most situations, there is less volatility over the long term when compared to the medium and short terms in the pre-budget period as well as less volatility over the long term when compared to the medium and short terms in the post-budget period. It means that when we look further into the long run, volatility and its effects constantly decrease. The F-test has been used to further test these results statistically.

Table 4: Results of F-test by comparing the variance of Post-budget returns with one another

YEAR	Y_1 & Y_2	P-Value	Y_2 & Y_3	P-Value	Y_1 & Y_3	P-Value
2023	1.092	0.453	1.229	0.342	1.125	0.362
2022	1.405	0.246	1.505	0.371	2.115	0.244
2021	1.412	0.251	1.463	0.388	2.066	0.252
2020	4.325	0.003**	1.049	0.543	4.537	0.075
2019	1.220	0.357	1.865	0.174	1.529	0.221
2018	1.100	0.399	1.727	0.199	1.899	0.137
2017	1.567	0.194	1.045	0.544	1.637	0.341
2016	1.279	0.281	1.441	0.386	1.127	0.515
2015	1.153	0.402	1.740	0.197	1.510	0.225
2014	1.203	0.328	1.524	0.250	1.833	0.150

Note: ** H_0 is rejected i.e., Highly Significant at both 5% & 1% levels (P<0.05) & (P<0.01).

The F-test values compare the variance of the returns during the short term, medium term, and long term post-budget period returns with one another as displayed in table 4. There isn't a single instance where the real value surpasses the P-value at either 1% or 5% significance level, with the exception of one in 2020 which is highly significant for Y_1 & Y_2 (0.003) and moderately significant for Y_1 & Y_3 (0.075). This indicates that volatility in a post-budget scenario typically decreases with increasing time period.

Table 5: Results of F-test by comparing the variance of Post-budget returns with Long term Pre-budget returns

YEAR	X_1 & Y_1	P-Value	X_1 & Y_2	P-Value	X_1 & Y_3	P-Value
2023	1.063	0.438	1.161	0.397	1.059	0.394
2022	3.102	0.002**	2.208	0.035*	1.467	0.237
2021	1.189	0.321	1.680	0.153	2.457	0.198
2020	6.257	0.000**	1.447	0.234	1.379	0.265
2019	1.287	0.249	1.055	0.429	1.967	0.126
2018	4.004	0.000**	4.403	0.000**	7.604	0.000**
2017	2.329	0.013*	3.648	0.006**	3.812	0.101
2016	1.263	0.269	1.013	0.513	1.423	0.405
2015	1.201	0.313	1.042	0.488	1.813	0.154
2014	1.299	0.242	1.079	0.456	1.412	0.255

Note: * H_0 is rejected i.e., Significant at 5% level only (P<0.05).
** H_0 is rejected i.e., Highly Significant at both 5% & 1% levels (P<0.05) & (P<0.01).

Table 5 displays the F-test values that compare the variance of the returns during the post-budget period short term, medium term, and long term returns with that of the long term returns prior to the budget. In comparison to the medium term, where the alternative hypothesis is accepted in three out of ten cases, and the short term, where the alternative hypothesis is accepted in one out of ten cases, the long term period indicates the greatest number of significant cases, with four out of ten cases are accepted. When compared to similar long term pre-budget returns, it shows that the long term post-budget period tends to be more volatile than the medium term and short term periods.

Findings

➢ The selected periods (2014-2023) have major fluctuations with both negative and positive returns during long term, medium term and short term period. Budgets have impact up-to 30 days prior and post-budget from the trading day.

➢ As the time period increases, the volatility of returns generally increases in the post-budget scenario. When compared to the long term pre-budget returns the post-budget returns in the long term period is considered as more volatile than short term and medium term periods.

➢ The paired sample t-test is used to determine that for short term, medium term, and long term, the influence of the budget on average returns is not significant, regardless of whether the returns are measured prior or post budget. The findings indicate that the Nifty 50 is impacted by the budget in long term basis.

- ➢ When compared to similar long-term periods prior to the budget, the F-Test results on the variances of returns shows that the long-term budget were more volatile than the medium-term and short-term budgets, but overall there is no obvious distinction.

Conclusion

This study examined the effects of budgets over a period of ten years and ten budgets, taking into account the returns and volatility in the Nifty 50 stock market. From the perspectives of the Government, the regulator, and investors, the hypothesis testing at different significance levels have produced a few interesting results. The study's findings indicate that the budget has the biggest influence on long-term returns, giving investors the opportunity to increase their investment gains. Even though the investor makes money, they still bear the risk of experiencing abnormal losses when expectations from the budget are not fulfilled. Typically, this occurs during trading on the day of the budget.

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