

Impact of Union Budgets on Indian Stock Market

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Abstract

This paper examines the impact of Union Budgets from 1996 to 2008 on the Stock Market as represented by Sensex in terms of returns and volatility. The impact on BSE Sensex has been studied prior to and subsequent to budget day. The periods have been segregated into short-term, medium-term, and long-term. With regard to returns the results prove that budgets have maximum impact in the short-term period, with some impact extending into the medium-term and no significant impact at all on long-term average returns. With regard to volatility the results indicate that the long-term period after the budget tends to be more volatile than the medium-term and short-term periods when compared to similar long-term period before the budget.

INTRODUCTION

The movement of share price is unpredictable in any economy. Sudden ups and downs of the price of shares make people wonder watching. Certain factors are held responsible for the movement in share prices. In some studies micro variables like dividend per share, earning per share, company size and book value per share have got importance and in others, macro variables like bank rate of interest, index of industrial production, union budget, inflation rate and foreign currency have been highlighted. Hence, annual budget is one such event which may have impact on stock market.

In India, the budget is an annual financial statement containing the estimated receipts and expenditure of the Government of India, which has to be laid before Parliament in respect of every financial year, which runs from 1st April to 31st March under Article 112 of the constitution. A budget is a powerful tool in the hands of

the Government to control the economic resources of the country. It contains proposals regarding changes in tax policy, industrial policy, trade policy, exchange rate policy and financial sector reforms which may have favourable or adverse impact on stock market.

REVIEW OF LITERATURE

Keeping in view the specific objective of the study, the reviews of earlier studies have been presented below :

Leon (2008) investigated the effects of interest rate changes on the stock market returns and volatility in Korea using weekly returns on the KOSPI 200 and the NCD 91-day yield over the period from 31 January, 1992 to 16 October, 1998. The results indicate that interest rates have a strong positive power for stock returns, and a weak predictive power for volatility.

Gupta and Kundu (2006) analyzed the impact of Union Budgets on stock market considering the returns and volatility in Sensex. They found that budgets have maximum impact in short-term post-budget period, as compared to medium-term and long-term average returns and volatility does not generally increase in a post-budget situation as the time period increases.

Upadhyay (2006) examined that Foreign Institutional Investors' participation in the Indian Stock Market triggers its upward movements, but at the same time, increased liquidity through FII investment inflow increases volatility too.

Porwal and Gupta (2005) examined the hot issue of volatility in the Indian stock markets. The study is based on daily prices of S&P CNX Nifty for a period of ten years. The year 1996 was found to be the most volatile during the study period. This is due to the political instability and absence of proper regulation.

Verma and Agarwal (2005) carried out an event study using budget as an event window for four years. The returns on CNX nifty index prior to and subsequent to the budget have been compared to assess the impact of the event. The findings of the study indicate that the event has a significant impact on the stock market.

Kaur (2004) studied the extent and pattern of stock return volatility of the Indian stock market during the years 1990 to 2000. She found that the month of April has been most volatile followed by March and February. This could probably be due to the effect of Union Budget which is usually presented in the last month of February.

Mohanty (2004) examined the stock price reaction to announcement of various policy issues by Government of India. The results show that the stocks generally react to public news quite quickly, but the first adjustment is not always the correct one.

Thomas and Shah (2002) explored the interplay between the Union Budget and the stock market. They concluded the stock market appears to be fairly efficient at information processing about the Union Budget.

Rao (1997) studied the impact of macroeconomic events like union budgets and the credit policy announcements on stock prices from 1991-95. He found that budgets increased the volatility of stock prices of the market portfolio. However, the credit policy announcements were found to have no impact on stock price behaviour.

OBJECTIVE OF THE STUDY

To examine the impact of Union Budgets on the Stock Market in terms of returns and volatility.

DATA AND METHODOLOGY

Sample Size

The study is based on one of the highly traded stock exchanges in India, i.e., Bombay Stock Exchange (BSE). Further, Sensex is selected from BSE because it gives a broad outline of the market movement and represents the market.

Study Period

The study covers the period from 1996 to 2008. This period includes a total of 15 budgets (including two interim ones) presented by various Finance Ministers in the Parliament (shown in Appendix 1). A total of 60 trading days before and after the budget has been considered to study the impact of budget (shown in Appendix 2). This has been done on an assumption that an impact of budget on share price can be identified on its own for a maximum of 30 days beyond which many other causes may distort the said effect. The study considers only trading days and leaves out any holiday or other days when the market remains closed. These trading days have been segregated into short-term (3 trading days), medium-term (15 trading days), and long-term periods (30 trading days) both before and after the budget.

Data Collection

The study is mainly based on secondary data which has been collected from various websites. The closing prices of BSE Sensex have been collected from the official website of BSE. While the budget dates and the name of their respective presenters have been gathered from Ministry of Finance website.

Hypothesis

A total of 12 hypothesis tests have been conducted to understand the statistical significance of the impact. The test tried to compare the average returns during various time periods with one another and also the budget day impact with average return from previous periods. In the hypothesis tests, $\mu(Rx_1)$, $\mu(Rx_2)$ and $\mu(Rx_3)$ represent the average daily returns during the previous 30, 15 and 3 trading days. $\mu(RY_1)$, $\mu(RY_2)$ and $\mu(RY_3)$ represent the average daily returns during the next 3, 15 and 30 trading days respectively. R_z represents the budget day (event day-end) return. This is not an average figure as it is a single day's logarithmic return over the previous day's closing figures.

The null hypothesis H_0 has assumed that the budget has no impact on Sensex. All hypotheses have been tested at 5% level of significance at the left tail.

In the first three tests, alternative hypothesis H_1 intends to prove that budget day return (i.e., R_z) is more than that found during the previous 30, 15 and 3 trading days [i.e., $\mu(Rx_1)$, $\mu(Rx_2)$ and $\mu(Rx_3)$] for all budgets. In the next set of nine tests, alternative hypothesis H_1 intends to prove that post-budget average returns [i.e., next 3, 15 and 30 trading days (i.e., $\mu(RY_1)$, $\mu(RY_2)$ and $\mu(RY_3)$)] are more than pre-budget average returns [i.e., previous 30, 15 and 3 trading days (i.e., $\mu(Rx_1)$, $\mu(Rx_2)$ and $\mu(Rx_3)$)] for all the budgets.

In next part of the study, the variance of returns (σ^2) have been compared between various time periods in order to find out the extent of volatility (σ) in the market around the budget period. F-test has been applied for hypothesis testing. Two sets of hypothesis tests have been conducted in this part of analysis. In the first set, variances of returns during the short-term, medium-term and long-term periods in the post-budget situation have been compared to one another, i.e., variances of returns between Y_1 & Y_2 , Y_2 & Y_3 and Y_1 & Y_3 respectively have been examined. These comparisons have been made because variances are expected to rise with the increasing time period and fluctuation in return is also historically found to be continuing in a post-budget situation. The null hypothesis in all the three tests assumes no change in variance, i.e., the variances are equal. The alternative hypothesis H_1 is that variance during Y_2 is more than that of during Y_1 , variance during Y_3 is more than that of during Y_2 and variance during Y_3 is more than that of during Y_1 respectively.

In second set, each of the post-budget short-term, medium-term and long-term periods has been compared to the long-term pre-budget period, i.e., variances of returns between X_1 & Y_1 , X_1 & Y_2 and X_1 & Y_3 respectively have been examined into. These tests have been framed with a more empirically established

fact that the variances in returns after budget for different periods are expected to be greater than the pre-budget long-term variance. The null hypothesis in all the three tests assumes no change in variance, i.e., the variances are equal. The alternative hypothesis H_1 wants to prove that variance during Y_1 , Y_2 and Y_3 is more than that of during X_1 .

Statistical Tools

The study has used the statistical techniques of paired t-test and F-test on average returns and variance in returns respectively over different periods around the budget.

FINDINGS

Table 1 depicts the daily average returns and budget day returns given by Sensex during the previous and next 3, 15,30 days around the budget day.

Table 1
Daily Average Return in Sensex

Year	X_1 (Last 30 days)	X_2 (Last 15 days)	X_3 (Last 3 days)	Z (Budget days)	Y_1 (Next 3 days)	Y_2 (Next 15 days)	Y_3 (Next 30 days)
1996 (interim)	0.52	0.56	0.18	-0.72	-0.89	-0.51	0.09
1996	-0.09	-0.09	1.06	1.17	-2.25	-0.64	-0.27
1997	-0.21	0.05	0.68	6.33	2.57	0.14	-0.01
1998	-0.37	-0.66	-1.66	-1.19	-0.89	-1.12	-0.31
1999	-0.08	0.04	-0.51	4.99	1.93	0.67	-0.07
2000	0.16	0.32	0.58	-5.25	-0.42	-0.42	-0.17
2001	0.02	-0.48	-1.54	4.26	-2.01	-0.89	-0.89
2002	0.34	0.52	0.93	-3.94	0.73	-0.05	-0.10
2003	-0.08	0.04	-0.45	0.19	-0.59	-0.30	-0.30
2004 (interim)	0.17	-0.47	-1.70	-1.32	0.97	0.13	-0.05
2004	-0.08	0.23	0.58	-2.29	0.38	0.37	0.19
2005	0.25	-0.05	-0.10	2.17	0.35	-0.06	-0.13
2006	0.31	0.36	0.19	0.85	0.72	0.30	0.36
2007	-0.04	-0.49	-1.32	-4.09	-1.38	0.004	0.11
2008	-0.33	0.11	0.33	-1.39	-2.03	-0.59	-0.21

Source : Calculated from the data taken from BSE website for the said period.

Note : All returns are in percentage.

On-day Effect of Budget on Sensex

The first set of paired t-tests measure the on-day (Z) influence of budget on Sensex when compared to the previous 3, 15 and 30 days. A cursory glance at Table 1 highlights that in most of the cases budget day returns (ignoring sign) are more than the returns during the previous 30, 15 and 3 trading days. Therefore, when the budget day returns (Z) compared with the short-term pre-budget return (X_3), it shows that budget day returns exceed in all the years (i.e., 15 out of 15 budgets) compared to medium-term (15 out of 15 budgets) and short-term (12 out of 15 budgets).

The above findings (Table 1) have been further statistically tested by Paired t-test (Table 2). The budgets are found to take the markets by surprise in all cases. In all the tests, the actual values are found to exceed the table values leading to acceptance of alternative hypothesis.

Table 2
Effect of Budget Day Returns on Sensex

	X_1 and Z	X_2 and Z	X_3 and Z
Actual Value (5%)	-4.78*	-4.64*	-3.73*
Table Value (5%)	-1.76	-1.76	-1.76

Source : Calculated from the data based on Table 1 with the help of Paired t-test

Note : * Signifies that Null Hypothesis (H_0) is rejected.

The second set of tests provided in Table 3 highlights that budgets have maximum impact in the short-term (alternative hypotheses have been accepted in all

Table 3
Impact of Budgets on Sensex

Period	Short-term Period			Medium-term Period			Long-term Period		
	X_1 and Y_1	X_2 and Y_1	X_3 and Y_1	X_1 and Y_2	X_2 and Y_2	X_3 and Y_2	X_1 and Y_3	X_2 and Y_3	X_3 and Y_3
Actual Value (5%)	-4.86*	-4.16*	-1.97*	-2.33*	-1.24	2.60	-1.86	1.14	4.18
Table Value (5%)	-1.76	-1.76	-1.76	-1.76	-1.76	-1.76	-1.76	-1.76	-1.76

Source : Calculated from the data based on Table 1 with the help of Paired t-test.

Note : * Signifies that Null Hypothesis (H_0) is rejected.

three cases). In medium-term, the alternative hypothesis has been accepted in one out of three cases and in long-term, no alternative hypothesis has been accepted. In total, the actual values exceed the tabular values in four cases (3+ 1 +0) out of nine at the left tail. This proves that budgets, when taken together have the maximum impact in the short-term post-budget period, with some impact extending into the medium-term and no significant impact at all on long-term average returns.

Table 4
Variance of Return in Sensex

Year	X ₁ (Last 30 days)	X ₂ (Last 15 days)	X ₃ (Last 3 days)	Y ₁ (Next 3 days)	Y ₂ (Next 15 days)	Y ₃ (Next 30 days)
1996 (interim)	0.036	0.037	0.009	0.036	0.018	0.016
1996	0.019	0.022	0.016	0.026	0.023	0.024
1997	0.033	0.016	0.010	0.069	0.041	0.060
1998	0.032	0.030	0.007	0.019	0.108	0.083
1999	0.020	0.013	0.007	0.067	0.031	0.070
2000	0.038	0.056	0.113	0.118	0.050	0.081
2001	0.020	0.019	0.026	0.059	0.095	0.069
2002	0.011	0.010	0.024	0.049	0.021	0.013
2003	0.006	0.007	0.007	0.002	0.014	0.016
2004 (interim)	0.032	0.048	0.001	0.023	0.022	0.023
2004	0.024	0.014	0.013	0.024	0.008	0.009
2005	0.009	0.004	0.000	0.015	0.006	0.011
2006	0.009	0.008	0.004	0.012	0.010	0.014
2007	0.015	0.017	0.022	0.077	0.045	0.039
2008	0.095	0.050	0.002	0.105	0.108	0.072

Source : Calculated from the data taken from BSE website for the said period.

Table 5 shows F-test values for the tests that compare the variance (given in Table 4) among the returns in Sensex during short-term, medium-term, and long-term periods after the budget with one another. In no other year except 2002 the actual value exceeded the tabular value. This signifies that volatility does not generally increase in post-budget situation as time period increases.

Table 5
F-test Results Comparing Variance among the Returns (Post-budget)

Year	Actual Value	Table Value (5%)	Actual Value	Table Value (5%)	Actual Value	Table Value (5%)
	Y_1 and Y_2	d.f. = 14/2	Y_2 and Y_3	d.f. = 29/14	Y_3 and Y_1	d.f. = 29/2
1996 (interim)	20	3.74	1.13	2.03	2.25	3.33
1996	1.13	3.74	1.04	2.03	1.08	3.33
1997	1.68	3.74	1.46	2.31	1.15	3.33
1998	5.68	19.43	1.30	2.03	4.37	19.46
1999	2.16	3.74	2.26	2.31	1.05	19.46
2000	2.36	3.74	1.62	2.31	1.46	3.33
2001	1.61	19.43	1.38	2.03	1.17	19.46
2002	2.33	3.74	1.62	2.03	3.77*	3.33
2003	7.00	19.43	1.14	2.31	8.00	19.46
2004 (interim)	1.05	3.74	1.05	2.31	1.00	3.33
2004	3.00	3.74	1.13	2.31	2.67	3.33
2005	2.50	3.74	1.83	2.31	1.36	3.33
2006	1.20	3.74	1.40	2.31	1.17	19.46
2007	1.71	3.74	1.15	2.03	1.97	3.33
2008	1.03	19.43	1.50	2.03	1.46	3.33

Source : Calculated from the data based on Table 4.

Table 6 depicts specifically F-test values for the tests that compare the variance of returns in Sensex during short-term, medium-term, and long-term post-budget periods with that of long-term pre-budget period. The long-term period shows the maximum number of significant cases (in 8 out of 15 budgets) as compared to medium-term (in 5 out of 15 budgets) and short-term (in 2 out of 15 budgets). It indicates that the long-term period after the budget tends to be more volatile than the medium-term and short-term periods when compared to similar long-term before the budget.

Table 6
F-test Results Comparing Variance among the Returns during Post-budget Periods with Long-term Pre-budget Period

Year	Actual Value	Table Value (5%)	Actual Value	Table Value (5%)	Actual Value	Table Value (5%)
	X_1 and Y_1	d.f. = 29/2	X_1 and Y_2	d.f. = 29/14	X_1 and Y_3	d.f. = 29/29
1996 (interim)	1.00	3.74	2.00	2.31	2.25*	1.85
1996	1.37	3.74	1.21	2.03	1.26	1.84
1997	2.09	3.74	1.24	2.03	1.81	1.84
1998	1.68	3.74	3.38*	2.03	2.59*	1.84
1999	3.35	3.74	1.55	2.31	3.50*	1.84
2000	3.11	3.74	1.32	2.03	2.13*	1.84
2001	2.95	3.74	4.75*	2.03	3.45*	1.84
2002	4.45 *	3.74	1.91	2.03	1.18	1.84
2003	3.00	19.46	2.33*	2.03	2.67*	1.84
2004 (interim)	1.39	3.74	1.45	2.31	1.39	1.85
2004	1.00	3.74	3.00*	2.31	2.67*	1.85
2005	1.67	3.74	1.50	2.03	1.22	1.84
2006	1.34	19.46	1.11	2.03	1.56	1.84
2007	5.13*	3.74	3.00*	2.03	2.60*	1.84
2008	1.11	19.46	1.14	2.31	1.32	1.85

Source : Calculated from the data based on Table 4.

The test values, however, do not prove whether the market index will rise or fall in the post-budget period because they have arisen from changes in the value of index after the presentation of budgets.

If one travels back in time to re-live the budget day moves made since the year 1996, a steep cut was witnessed in the year 2000 when the Sensex tumbled over 5 per cent (as shown in Table I). The budget causes disappointment among the investors as it did not live up to the 'hype' created ahead of its announcement. The increase in the tax on dividend outgo for companies and subjecting export earnings to a 20 per cent tax per annum over the next five years were seen as unfavourable by the market and also, the Budget failed to address macro-economic issues, such as fiscal deficit, Government spending and public sector disinvestment.

In 2002, once again, the stock markets fell by 4 per cent with a lukewarm budget. In 2007, stock market crashed by 4 per cent. This was the biggest fall on a Budget day in the past five years. The fall was due to market unfriendly Union budget which includes increased dividend distribution tax from 12.5 per cent to 15 per cent, increase in excise duty on cement prices and followed by the extension of minimum alternate tax (MAT) for the IT sector.

Hence, if an investor wants to make any gain from budget swings, he will have to predict the budget announcements that will cause a rise or fall in post-budget share prices.

CONCLUSION

With regard to return an investor has the chance to earn super-profits by investing during the short-term and medium-term periods around the budget (up to 15 trading days). However, he also faces the risk of abnormal losses if his expectations are not met from the budget. This is also true in case of trading on the budget day. As one moves away from the budget day (up to 30 trading days), the paired t-tests do not show any significant change in average returns. Hence, budgets are seen to have effect only up to 15 trading days from the budget day so far as return is concerned.

Volatility, on the other hand, does not generally increase in post-budget situation as the time period increases. But the long-term period after the budget tends to be more volatile than the medium-term and short-term periods when compared to similar long-term period before the budget. In only 13% cases (2 out of 15 budgets) post-budget volatility during short-term, in 33% cases (5 out of 15 budgets) post-budget volatility during medium-term and in 53% cases (8 out of 15 cases) post-budget volatility during long-term tends to increase in relation to the volatility during long-term before the budget. Hence, when volatility and return taken together, the budget has greater impact on return than volatility in short-term period but in long-term period the budget has greater impact on the volatility than return.

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Year	Volatility	Return
1997	0.0000	0.0000
1998	0.0000	0.0000
1999	0.0000	0.0000
2000	0.0000	0.0000
2001	0.0000	0.0000
2002	0.0000	0.0000
2003	0.0000	0.0000
2004	0.0000	0.0000
2005	0.0000	0.0000
2006	0.0000	0.0000
2007	0.0000	0.0000
2008	0.0000	0.0000
2009	0.0000	0.0000
2010	0.0000	0.0000

Appendix 1**List of Budgets Covered**

S. No.	Date	Presenters
1.	15 March, 96	Manmohan Singh's Budget (interim)
2.	22 July, 96	P. Chidambaram's Budget
3.	28 February, 97	P. Chidambaram's Budget
4.	1 June, 98	Yashwant Sinha's Budget
5.	27 February, 99	Yashwant Sinha's Budget
6.	29 February, 00	Yashwant Sinha's Budget
7.	28 February, 01	Yashwant Sinha's Budget
8.	28 February, 02	Yashwant Sinha's Budget
9.	28 February, 03	Jaswant Singh's Budget
10.	3 February, 04	Jaswant Singh's Budget
11.	8 July, 04	P. Chidambaram's Budget
12.	28 February, 05	P. Chidambaram's Budget
13.	28 February, 06	P. Chidambaram's Budget
14.	28 February, 07	P. Chidambaram's Budget
15.	29 February, 08	P. Chidambaram's Budget

Appendix 2**Period Covered for Each Budget**

S. No.	Year	Period (60 Trading Days Plus Budget Day)
1.	1996 (interim)	15/1/96 to 16/4/96
2.	1996	1 0/6/96 to 4/9/96
3.	1997	16/1/97 to 12/4/97
4.	1998	13/4/98 to 13/7 /98
5.	1999	14/1/99 to 17/4/99
6.	2000	17/1/00 to 13/4/00
7.	2001	16/1/01 to 16/4/01
8.	2002	17/1/02 to 15/4/02
9.	2003	16/1/03 to 15/4/03
10.	2004 (interim)	18/12/03 to 17/3/04
11.	2004	27/5/04 to 19/8/04
12.	2005	13/1/05 to 12/4/05
13.	2006	13/1/06 to 17/4/06
14.	2007	12/1/07 to 13/4/07
15.	2008	18/1/08 to 17/4/08