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Stock Price Reaction of Indian Budget Announcement: An Event Study in the Pharmaceutical Sector

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ABSTRACT:

Union budget announcement is a major macroeconomic event in India. The pharmaceutical sector is a booming industry today, with new research happening in medical sciences every day, making it an appropriate center of study. This paper looks into how the event of budget announcement impacted pharmaceutical sector index performance for the past ten years, i.e., 2014-2023. Standard event study methodology has been applied, and the market model has been used to calculate expected returns. Abnormal returns, cumulative abnormal returns, and t-statistics for AR and CAR have been calculated. For the majority of years, AR and CAR are insignificant. Thus, the study findings indicates that budget announcement event does not influence pharmaceutical stocks' performance.

Keywords: Event Study, Stock Market Indices, Budget Announcement, Pharmaceutical Sector.

Introduction

Union budget announcement happens every year in our country, where the elected central governments put forward their fiscal plans for the year. It is presented in the parliament by the finance minister. These financial policies are related to the development of different sectors of an economy. These union budgets bring in new regulations and policies, which ultimately have a favorable or adverse impact on stock returns. Various studies reveal that budget announcement event influences stock activity often. In this paper, we look into the relationship between budget announcements and the performance of pharmaceutical stocks.

The pharmaceutical sector is the focal sector for this paper because of its growing dominance worldwide, especially post-pandemic. The domestic pharma market is expected to reach US$130 billion by 2030. India stands 3rd in the world in terms of production of pharma products and is the largest supplier of generic medicines worldwide. The Union government recognizes the industry's potential and has supported pushing innovation and funding research projects. Though cumulative FDI in the pharma sector is more than US$20 billion, Indian companies still need to prove themselves as innovators, which is impossible without a proper R&D structure in the economy.

The study explores the efficiency of the market, the pharmaceutical sector in particular. The theory put forward by Fama (1970) categorizes the market into three forms of efficiency, i.e., weak form, semi-strong form, and strong form. When in weak form, past data on stock prices are futile for predicting its future performance. In contrast, in solid form, investors cannot make consistently high abnormal profits, as all the public or private information is reflected through the price. The semi-strong form of the market quickly adjusts price anomalies, and abnormally large profits cannot be earned by using public information.

Literature review

Samontaray (2010): the study aims to identify the relationship between 14 independent and one dependent variable through 50 companies (nifty 50 index) in 2007-08. Cross-sectional regression analysis is applied to know which variable has the most impact on the company's share values. The findings indicate that EPS, sales, net fixed assets, and corporate governance score impact the share price of the Nifty 50 index significantly.

Kumar et al. (2021): the paper intends to throw light on the impact of covid 19 pandemic on stock prices and how the size of the firm influences the proportion of impact through event study methodology (Fama et al. (1969)). For this purpose, 1335 companies are listed on the national stock exchange, and the period from Jan 2018 to December 2020 is considered. Also, how the 19 major industries reacted to the pandemic is looked into

through the study. OLS market model is used for calculating the average return, and a cross-sectional t-test, as proposed by brown and warner, is conducted to conclude the significance. Larger firms were more negatively impacted than smaller firms. Sectors wise most negatively impacted were financial services, automobiles, banking, agriculture, electrical goods and construction. A slight negative impact was measured on the media and drugs & pharmaceutical industries.

Kharuri et al. (2021): the study included 20 stocks from various significant industries selected randomly from nifty 50. The study takes into consideration 20 years from 2001 to 2020. The result indicated that the union budget announcement had a positive reaction. The paper concludes that the event is predictable, and investors can generate abnormal profits.

Maheshwari et al. (2020): in this paper performance of various sectoral indices such as Automobile, Banking, IT, FMCG, Financial Services, Metal, Media, Pharma, Realty, and Consumer Durable is compared during the budget announcement event. The conclusion mentions that only two sectors (banking and financial services) show significant impact due to budget announcements. Also, the results indicate that the market is semi-strong efficient.

Sardana et al. (2019): the study included 31 companies listed on BSE for an event window of 41 days to see how union budget announcement affects them. The event study methodology by Warner and Brown is used—the expected returns are calculated via the market model. Though the CAAR on the event day was significant, it was not carried form, which shows that the market was semi-strong efficient during the event period.

Deepak R and Bhavya N. (2014): the data analysis were applied to the first difference of the natural logarithms as the series was tested as non-stationary(Dickey and Fuller test, 1979 and 1981). the study observed that the market was efficient as the returns before and after events were not significantly different. Also, the market generally reacted negatively in the anticipation period.

Agrawal (2020): Five Budgets announced from 2015 to 2020 were part of the research, studying short-term (3 days), medium-term (15 days), and long-term (30 days) effects of the announcement on the NIFTY index. In the long term, the market settles down, showing no significant impact: the short term and the long term.

Singhvi (2014): stock market volatility was explored by measuring the pre and post-budget returns from 1996 to 2013. Short-term, medium-term and long-term periods were considered. In all the periods, the impact of the budget announcement was insignificant.

Gayathiri and ganesamoorthy (2018): the study was done using regression analysis, where BSE SENSEX was taken as an independent factor, and returns on the share price of BSE 30 companies were measured to see how the union budget announcement influenced them in 2018. Though Abnormal return presence was there on the event day, it was shallow. Also, the average abnormal returns were not significantly different; thus, concluding union budget announcement did not impact the Indian stock market significantly.

Saraswat and Banga (2012): the study takes S&P CNX nifty index as a proxy to see the influence of budget announcements from 1995 to 2010 on the Indian stock market. Here, the impact is visible for a long-term period (30 days), and the investors may make profits. However, post this long-term period; average returns are similar. Volatility is more in short-term periods when compared to long- and medium-term periods.

Shafiq and Qureshi (2022): in this study, only two sectors, i.e., pharmaceutical and automobile sectors, were taken into observation to know how Pakistani Union Budget announcements for ten years (2011-2020) affect their performance. The findings show that both sectors perform positively, but the event's impact is insignificant. Also, pharmaceutical sector stocks show more volatility than automobile stocks.

Objective

The study's primary purpose is to discover how the announcement of union budgets has influenced the stock prices of the pharmaceutical industry. For this, we are taking the NSE Pharma index as a proxy.

The main objectives are as follows:

1. To study the impact of the budget announcement on the Pharma Index on NSE.
2. To know the presence of volatility level around the time of the union budget announcement
3. To examine whether there are any abnormal returns on pharma stocks around the budget announcements.

Hypothesis:

H01: Pharmaceutical stocks are not semi-strong efficient during budget announcements.

H02: There is no significant volatility during the budget period on the pharma index.

H03: There is no significant abnormal return (CAR) during the event window caused by the union budgets.

Research Methodology

Sample and data collection

Sample: NSE Pharma is taken as a proxy for measuring the aggregate performance of pharmaceutical sector stock performance on the National Stock Exchange. Data for ten years, i.e., 2014 to 2023, is considered for the study. The event under observation is union budget announcements; thus, each year's budget announcement day in the parliament is taken as the event date. The nifty 50 index is taken as an independent factor to estimate returns on the NSE pharma index.

Data collection: The closing prices for NSE Pharma Index and NSE nifty index has been collected from National Security Exchange (NSE) website.

An estimation period of 60 days is used for calculating different parameters. The anticipation and adjustment period is of 15 days each. In total, the event window of 31 days has been taken into account. In the paper, standard event study methodology has been applied. The market model is utilized for calculating abnormal returns.

Abnormal returns and cumulative abnormal returns for the pharma index have been calculated. Two-tailed t-test at a 5% significance level has been used to test the significance of abnormal returns in the event period, thus testing the efficiency of the market. The study's results will be considered statistically significant only if the absolute t-statistics are greater than 1.96. If the t value is less than 1.96, the results will be assumed to be statistically insignificant.

Analysis and findings

Major parameters year-wise stated in table 1 show values of Alpha, Beta, and Standard Deviation. Beta values indicating the systematic market risk is less than 1 for all the years, showing that the market for the pharma sector has been less volatile when compared with the broader nifty index. Also, the standard deviation is less than 1 for all the years. Thus, H02 is accepted.

Abnormal returns for the first, second, fifth, tenth, and fifteenth days' before and after the event given in table 2 indicate that negative abnormal returns are common in the event window. T-statistics of abnormal returns have been chiefly insignificant for the past 10 years. However, for 2015, the first and fifth day after the event, abnormal returns are positively significant. In 2016, abnormal returns for the first, second, and tenth day after the event, AR is negatively significant. In 2019, the tenth day before and after the event, AR is negatively significant. In 2020, the fifth day before and after the event, AR is positively significant. Thus, for the majority of years H03 is accepted.

T-statistics of cumulative abnormal returns (CAR) is presented in table 5. Event window of 3, 5,11,21, and 31 days is taken to measure the significance. For most of the time period, t-value is insignificant, but for the year 2015, the t-value of CAR for 31 days, 11 days and 3 days window are significant. Also, for 2021 and 2022, 31 days event period t-value of CAR is significant, showing that the budget announcement event did influence the index performance of the pharmaceutical sector on NSE for these years. CAR is insignificant for the rest of the eight years and in the majority of windows for 2015, 2021 and 2022. Thus, we can accept H04 that the market is a semi-strong efficient state during the budget announcement period.

Table 1: alpha, beta and standard deviation for various years

Parameters/ Year	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*
Alpha	-0.00048 7352	0	0.00068 1	-0.00095	-0.00043	-0.00188	0.85861 0633	-0.00064 5851	-0.0008	-0.00048 7352
Beta	0.30898 4031	0.60369 3287	0.91202 9	0.85196 1	0.93508 8	0.86527 8	0.00032 6607	0.83071 7224	0.42087 1	0.30898 4031

STDEV	0.00725 3352	0.00918 8871	0.01094 2	0.01145 2	0.00927 7	0.01187 7	0.00793 475	0.01164 2548	0.01031 8	0.00725 3352

Table 2: Abnormal return 2014-2023

Window	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*
-1.00	-0.009656432	0.001354072	-0.009563431	-0.0089	-0.0164053	-0.002279639	-0.007021087	-0.006562674	0.010110121	-0.009656432
-2.00	-0.00221821	-0.004719471	0.009782849	0.006134	0.001101116	-0.000630528	-0.014584653	0.001565505	0.01152358	-0.00221821
-5.00	-0.009305176	-0.003573745	0.009185873	0.004634	0.006284676	0.00701277	0.023479416	0.000872134	-0.006474451	-0.009305176
-10.00	-0.003149065	0.010056269	-0.014473263	0.003221	0.005286925	-0.025230285	-0.000544173	-0.006636713	-0.00768717	-0.003149065
-15.00	0.00336704	-0.013724548	-0.001453524	-0.00032	-0.001360926	0.000393761	-0.002947227	0.004451991	-0.003628604	0.00336704
1.00	-0.00341538	0.015427005	-0.020050168	0.02012	0.009521946	-0.017169979	-0.009482157	0.000634399	0.008266256	-0.00341538
2.00	-0.013676864	0.009206066	-0.02059331	0.01501	0.011558959	-0.001151215	-0.000820584	0.020504206	0.004096228	-0.013676864
5.00	0.011476486	0.015786592	0.002153045	-0.00109	0.028044328	0.003844033	0.016323826	-0.008444902	0.00421106	0.011476486
10.00	-0.001949877	0.000556972	-0.024818561	-0.01042	0.005803173	-0.027491123	0.003509626	-0.010827877	-0.004028196	-0.001949877
15.00	0.002908338	0.00151044	-0.003567665	-0.0067	0.017035811	0.009348583	-0.012200831	-0.007903644	-0.002184619	0.002908338

Table 3: T statistic of abnormal return for various years

window	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*
-1.00	-1.00035	0.176978	-1.05386	-0.79942	-1.5235	-0.19288	-0.909285971	-0.565788122	1.027924545	-1.30179
-2.00	-1.18516	-0.61684	1.078035	0.550788	0.102224	-0.05335	-1.888827331	0.13496699	1.171634912	-0.29904
-5.00	0.892473	-0.46709	1.01225	0.416149	0.583448	0.593361	*3.040769101	0.075189346	-0.658275687	-1.25444
-10.00	0.162061	1.314358	-1.5949	0.289288	0.49082	-*2.13477	-0.070474671	-0.572171252	-0.781576277	-0.42453
-15.00	0.721229	-1.7938	-0.16017	-0.02881	-0.12634	0.033317	-0.381689122	0.383819736	-0.368930439	0.453913
1.00	0.865603	*2.016316	-*2.20946	1.806756	0.883985	-1.45278	-1.228013959	0.054693444	0.840453601	-0.46043
2.00	-0.60108	1.203236	-*2.26931	1.347888	1.073094	-0.09741	-0.106272022	1.7677301	0.416475081	-1.84379
5.00	0.306745	*2.063314	0.237258	-0.09821	*2.603539	0.325249	*2.114063907	-0.72806075	0.428150321	1.547152
10.00	-0.1219	0.072796	-*2.73492	-0.93551	0.538747	-*2.32607	0.454524193	-0.933504314	-0.409558011	-0.26286
15.00	-1.86342	0.197415	-0.39314	-0.60137	1.581546	0.790998	-1.580103658	-0.681397281	-0.22211639	0.392075

Table 4: Cumulative abnormal return (CAR) for various years

window	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*
31.00	-0.00291	0.034027	-0.02445	-0.00785	-0.02963	-0.00624	-0.010619108	-0.05016	0.036006	-0.01214
21.00	-0.02225	0.038514	-0.03526	0.01329	-0.01697	-0.00802	-0.026024344	-0.02809	0.051626	-0.02804

11.00	0.007921	0.082786	-0.02207	0.008887	-0.00347	0.02403	0.012949547	-0.00126	0.033001	-0.01898
5.00	0.081508	0.080777	-0.05285	-0.03766	-0.01493	0.023206	0.008534114	-0.06359	-0.00553	-0.02548
3.00	0.106052	0.1054	-0.08612	-0.01307	-0.04354	0.044442	0.028371005	-0.09216	-0.02417	-0.03796

Table 5: T statistic of CAR for various years

window	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*
31.00	-0.172	*2.137961	-1.28989	-0.39595	-1.84415	-0.30313	-0.77267	-*2.48734	*2.014821	-0.96651
21.00	-1.01978	1.874416	-1.44099	0.518984	-0.81817	-0.30189	-1.46677	-1.07895	*2.237703	-1.72868
11.00	0.244784	*2.716416	-0.6081	0.233978	-0.11268	0.610027	0.492068	-0.03268	0.964387	-0.78898
5.00	1.822939	1.918287	-1.05403	-0.71768	-0.35111	0.426361	0.234701	-1.19192	-0.11703	-0.76647
3.00	1.95216	*2.060143	-1.41361	-0.20495	-0.84286	0.672055	0.642186	-1.42171	-0.42071	-0.93987

Conclusion

The findings indicate that the market is in a semi-strong form of efficiency for most years. The result is consistent with the study of Shafiq and Qureshi (2022).

Thus, investors did not perceive the budget announcement as a significant event for pharmaceutical stocks listed on NSE, except for three years, i.e., 2015, 2021 and 2022. During these three years, the Union budget consisted of vital information regarding the sector, grabbing investors' attention. 2015 has been an important year for the pharma sector as it was included in the "Make in India" campaign. In 2021, when the vaccination drive was happening worldwide, the pharma sector outlay increased by 137% compared to the previous year. In 2022, finance minister Nirmala Sitharaman introduced pharma as the Sunrise opportunity sector and announced government support of up to 20% to boost manufacturing, R&D, and innovation.

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