

An Empirical Study of Stock Split Announcements of Select BSE Sectors using Event Study Methodology

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Abstract

This study examines the stock market reaction to stock splits between 2002 and 2013 of 6 sectors of BSE—Auto, Bankex, Consumer Durables, FMCG, Health Care and IT sectors to find out if the Indian stock market is semi-strong efficient or not. The methodology used is event study under the market model. Samples of 14 stock splits are considered spread across 6 sectors. The results indicate that there are significant positive abnormal returns prior to split announcements. On the day of split announcement, 1 sector reacts positively (Health Care—3.3%) and the 5 react negatively (Auto -1%, Bankex -0.9%, CD -0.3%, FMCG -1%, and IT-1%). The results indicate that the null hypothesis, H_0 , that there is no significant AAR around the stock split announcement dates is accepted.

Keywords: *Efficient Market Hypothesis, Event Study, Stock Splits, Average Abnormal Returns, Cumulative Average Abnormal Returns, Value Creation*

1. Introduction

A stock split or a stock divide is a procedure that increases or decreases a company's total number of shares outstanding without altering the firm's market value or the proportionate ownership interest of existing shareholders. Most companies prefer that to keep their share prices at an affordable level and the stocks accessible to as many investors as possible. Though the move will not increase the company's overall value, it will lift the firm's shares to a more affordable price range.

The relationship between stock splits and share prices has been a subject of empirical discussion within the finance literature. As the split date is known well in advance, it should ideally contain no new information. One would not expect any significant price reaction to split announcements. But contrary to the theoretical predictions, empirical studies have documented a statistically significant market price reaction. Firms announcing splits experience rise in their stock prices

on an average thus supporting the semi strong form of EMH.

Market reaction is the general market response that happens after a major piece of economic data or some significant news is flashed. Market reaction can be bullish, bearish or neutral, depending on the content and significance of the information. 3 types of reactions can be observed—positive reaction wherein the news is seen as good for the country and the market participants get into buying mood resulting in a strong upward trend, negative reaction where the news is seen as bad for the country and the market participants get into selling mood resulting in a strong downward trend and uncertain when there is no market consensus on whether the news is good or bad, there is a mixed reaction in the market with some participants selling and some others buying causing volatility to the prices.

The share price may increase in response to this information and affect the wealth of shareholders.

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2. Efficient Market Hypothesis

An efficient capital market is a market where security prices fully reflect all relevant information that is available about the fundamental value of the securities. The term ‘market efficiency’ explains the relationship between information and share prices reaction in capital market literature (Mishra, 2007). A market is efficient with respect to information set if it is impossible to make economic profits by trading on the basis of information set. Economic profits are risk adjusted returns net of all costs. Fama (1970) defines an efficient market as a market in which prices always reflect the recent available information, at any given time, the prices in the market already reflect all known information, and also change fast to reflect new information. He further states that three different levels of efficiency exist based on ‘available information’ – the weak, semi-strong, and strong forms.

Weak form efficiency or the Random Walk Theory states that prices of stocks can never be predicted because of the random nature of the stock price movements. This means at any given time there is an equal chance of a stock’s price rising or falling.

The Semi-strong Form Efficiency states that all publicly available information about the company, like its product line, final accounts, future earnings, accounting practices and management is considered besides information about its past prices. Fama (1991) coined a new term for the semi strong model—the event study.

Strong Form Efficiency model indicates that stock prices reflect all information relevant to the firm—past prices (weak model), company information (semi strong model) and also inside information about the company. Insiders are managers of the companies who have access to confidential information who possibly may use it to generate higher returns.

3. Literature Review

An event study is an empirical analysis used to assess the effect of an event on stock returns. Event studies have been the primary methodology used to assess the

effect that the occurrence of an event has on the returns of a firm’s common stock price. The most influential paper in stock split research is the study made by Fama, Fisher, Jensen & Roll (1969) surrounding the execution dates of stock splits. They examined the abnormal behaviour in the return rates of a stock during a stock split. The residual analysis technique introduced by the authors is one of the very important financial analysis techniques and is used all over the world for studying events. Their study found that stock splits are usually preceded by high returns though markets have not received any information about the split. Experiencing remarkable increases in earnings and dividends, companies go in for splits. Investors look for any information available from the company and interpret the splits as a greater possibility that the dividends will increase. Thus, by reacting to the split in a positive manner, the market reacts to the dividend implications of the split.

Wu and Chang (1997) examine 67 splits for the period 1986 to 1992 of companies listed on Hong Kong Stock Exchange and find that there are excess returns over the three days surrounding a split announcement and this was an astounding 18.2%. Investigating the stock splits 5264 NYSE listed firms that took place between 1925 and 1996, Conroy R et al (1999) find that the market values of such stocks increased significantly around split announcement dates. Studying the reaction of investors of Stockholm and Helsinki Stock Exchanges, Antti Niini (2000) investigated the wealth effects on shareholders around the announcement and execution dates of stock splits. Using a sample of 18 announcements for Finnish companies and a sample of 90 announcements for Swedish companies from time period 1985-1997, his research was to observe the presence of statistically significant abnormal returns around the announcement and execution days of stock splits. His findings confirm the existence of statistically significant abnormal return surrounding the announcement day at both the Swedish and Finnish markets. However, abnormal returns were seen around the execution dates of stock splits of Stockholm Stock exchange, but not at the Helsinki Stock Exchange.

Wulff’s (2002) study of 83 execution date splits and 78 announcement date splits of Frankfurt stock exchange firms between 1994 and 1996 strengthened

the abnormal returns theory that there were significantly abnormal returns both on the announcement and execution day of German stock splits. He also noted that the liquidity hypothesis took the form of the trading range hypothesis, which stated that companies tended to move their share prices towards an optimal perceived trading range after the share price had risen substantially. In a study on Canadian stocks, Elfakhani and Trevor Lung (2003) find that stock split announcements resulted in positive cumulative abnormal returns. Bechmann K L and Johannes R (2004) reported positive and significant announcement effect for Danish stock splits. They explained this announcement effect was a consequence of an increased payout of the splitting companies. Byun J and Rozeff M (2003) examined the post-split performance of 12,747 stock splits between 1927 and 1996 with statistical tools like time regression analysis and book-to-market reference portfolios. The study finds small or negligible abnormal returns and they conclude that the long-term stock split evidence to market efficiency was neither pervasive nor compelling. Carrying out a research on stock market anomalies in Japan, Kuse Y and Yamamoto T (2004), find that there is excess cumulative abnormal return during the 30 business days before and after the stock split announcement. Choosing a sample of 120 companies and splitting them into two groups—one with a split factor less than 2 for 1 and the other group with a split factor greater than 2 for 1, they conclude that the group with the larger split factor had a higher return immediately after the stock split announcement, with the peak cumulative abnormal return reaching about 28.8% 37 business days after announcement.

A study by Kalay et al. (2007) also concludes that there is an association between stock splits and abnormal returns. They also note that abnormal returns were significantly higher when there were earnings or dividend announcements. Leemakdej A (2007) carried out a research of 100 splits in the Stock Exchange of Thailand and detected significantly negative returns in the 20 days before and 18 days after the effective date of the split, with the most significant returns clustered around the event date. This was in contrast to other studies that noted positive returns around stock split dates. Earnings and dividends were seen to increase after the split. There was also an increase in both the proportion of large

shareholders and the number of investors, the bid-ask spread being narrower. Trading volumes were however found to be lower than before. This study also found the evidence that the systematic risk was lower during the split date but returned to previous level after the split. Dhar S and Chhaochharia S (2008) found that 77% of their sample firms had positive mean return in respect of stock split and there was a significant average abnormal return at 0.01% significance level. Their study also supported the signalling hypothesis which was consistent with the findings in the developed stock markets.

Crawford et al (2005) conclude that splitting of stocks increases its market liquidity and will therefore attract small investors. Studying the relationship between splits and retained earnings, Lyroudi et al (2006) wrap up their study stating that managers are more confident about replenishing retained earnings in the future with increased earnings.

Studying the Indian markets, Gupta & Gupta (2007) conclude that there are no positive abnormal returns associated with stock split announcements, though positive wealth effects were recorded on ex-day. Joshipura (2008) finds that there are positive abnormal returns both around the time of announcement and on the effective day, however, he also concludes that this effect does not sustain long and overall there is no impact on the shareholders wealth. Positive abnormal returns on the stock split announcement day and a significant improvement in post-split liquidity was reported by studies conducted by Ray (2011) and Chakraborty (2012).

4. Objectives of the Study

1. To assess the stock returns in terms of change in market value around stock split announcement days for companies listed on BSE Bankex, BSE FMCG index, BSE IT index, BSE Health Care index, BSE Consumer Durables index and BSE Auto index
2. To examine the effect of stock split announcement on stock prices in terms of returns due to change in market value of the companies listed on BSE 500.
3. To test the speed with which stock split announcements are absorbed by the companies listed in the sectors mentioned above.

5. Hypothesis

H_01 : There are no significant Average Abnormal Returns (AAR) around the stock split announcement dates i.e. $(1/n) \cdot \sum AR = 0$ where n is the number of sample companies.

H_02 : The Indian stock market is informationally not efficient to stock split announcements; the stocks do not impound the information instantaneously.

H_a1 : If AR_t and $CAAR_{t1,t2} > 0$ and statistically significant, it indicates that the stock prices on an average have reacted positively to stock splits, increasing the wealth of shareholders.

H_a2 : The Indian stock market is informationally efficient to stock split announcements; the stocks impound the information instantaneously.

6. Scope of the Study

The study is based on daily prices of the stocks listed in BSE Bankex, BSE FMCG index, BSE IT index, BSE Health Care index, BSE Consumer Durables index and BSE Auto index for a period of 9 years from 2005 to 2013. These 6 sectors are the initial 6 sectors of the sectoral indices and chosen based on the trading volumes.

7. Sample

The present study is based on secondary data relating to share prices, stock split announcement dates and the value of index around these days. Daily closing prices of the stocks and concerned index are considered, the data ranging between 2005 and 2013. The secondary data is collected from annual reports, published research reports and from websites like, www.bseindia.com, www.moneycontrol.com, www.rediff.com, www.sebi.gov.in and www.yahoofinance.com.

8. Data

A sample of 14 stock splits of companies listed in 6 BSE sectors—BANKEX, FMCG, Auto, Health Care, Consumer Durables and IT for the period 2005-2013 is

considered. (There were only 14 split announcements in these sectors in the above period).

- Stock split announcement dates of the companies under study are collected from press reports and NSE and Economic Times websites
- The announcement dates for splits are extracted from the website <http://economictimes.indiatimes.com>.
- Daily traded BSE prices are extracted from the website <http://finance.yahoo.com>. NSE prices are considered for companies not listed on BSE

9. Methodology

Standard event study methodology as per the market model, the steps of which are given in the estimation procedure below has been used for the research. The event date, event window and estimation window are defined as below:

- The event date is the announcement date of stock splits by the sample companies. This approach assumes that the information was first known to the market on the event date itself.
- The event window is taken as $t = -30$ to $t = +30$ relative to the event day $t = 0$. This window will help in studying the stock price behaviour pre and post the event.
- The estimation window is $t = -252$ to $t = -30$ relative to the event day $t = 0$. However, a smaller window has been used if corresponding data is unavailable. Estimation window will help in estimating the relationship between a company's returns and the benchmark index and calculation of intercept, slope RSQ and t-test.

10. Estimation Procedure

1. Return on security j and returns of the index for period t is calculated as
 - a. Current Daily Return = $LN^{\#}$ (current day close price – previous day close price) / previous day close price.

Note: $\#$ Log normal (LN) prices are considered to create a continuous time measure of the returns for both the estimation period and the event window.

2. Alpha and Beta are calculated from the OLS regression equation.
3. The expected return for each firm as well as for the S&P 500 was calculated:
 - a. Expected Return = [(Alpha + Beta) * S&P actual return]
4. Excess Return is obtained as follows: Actual Return – Expected Return
5. The Average Abnormal Returns (AARs) are computed by averaging the abnormal returns of the sample companies for each day of event period.

$$AAR_t = 1/N * \sum_{j=1}^N AR_{j,t}$$

6. The Cumulative Average Abnormal Returns (CAARs) are the sum of daily Average Abnormal Returns (AARs) during the event window.
7. The average abnormal returns in all the trading days in the event window and cumulative average abnormal returns during the event window are analysed by using the 't' test to identify whether they significantly differ from zero.

11. Data Analysis and Results

11.1 Analysis

This paper examines the stock split announcements of companies and price reactions for the period 2000 to 2013 using the standard event analysis methodology. Abnormal returns are calculated using the market model.

Table 1 shows the beta (sensitivity) of the sample stocks under consideration with respect to their index. The RSQ or R^2 shows the square of correlation between R_j and R_m . The coefficient of Determination or R^2 , indicates the fraction of the variance of the dependent variable (the stock return) that is explained by the movements in the independent variable (index return). It shows the regression of daily stock returns on the daily indices returns. Beta coefficients are highly significant for 7 companies (Tata Motors, M&M, Kotak Mahindra bank, Titan Industries, VIP, ITC and Aurobindo Pharmaceuticals Ltd.) indicating that risk is an important determinant of company's return. None of the T Test values indicate that the stock is statistically significant at 5% level of significance.

11.2 Findings

11.2.1 Auto Sector

AR Analysis: The auto sector reacted negatively ($t_0 = -1\%$) on the stock split announcement day. The t-tests do not prove the split announcement to be significant as the t-statistic values are less than the critical value of 1.96%. There are no abnormal gains to shareholders on stock split announcements by the Auto sector firms, the null hypothesis is accepted.

The Table 3 shows that CAR was negative initially and increased marginally between -15 and -1 time window. The returns showed a gradual decline from the announcement day till the end of the event window. Stock split announcements were not greeted positively by the investors. There were negative abnormal gains, in other words, losses to shareholders of auto sector due to stock split announcement. The CAR in the time intervals -30 to -15, -15 to -1, -1 to 0, 1 to 15 and 15 to 30 days were -0.163%, 1.97%, 0.98%, -0.99%, -3.53% and -4.25% respectively. The CAR T Stat values in the time intervals of 1 to 15 days and 15 to 30 days are statistically significant at -3.094 and -3.842. All other CAR at different time windows of -30 to 15, -15 to -1, 0 to 1 and 1 to 15 are not statistically significant. It can be concluded that shareholders have gained in the time intervals of 1 to 15 and 15 to 30 days and have not received any gain in the other time intervals.

As can be seen from the above Exhibit, both CAR and AR had small advances and declines. Commencing at a modest 0.5% on day -30, both upward and downward swings in CAR were seen. AR was a mixed bag of throughout. There were short rallies of positive and negative rallies.

11.2.2 Banking Sector

AR Analysis: The banking sector reacted negatively ($t_0 = -0.9\%$) on the stock split announcement day. The t-test statistics confirm that the difference between the calculated values and critical values is insignificant as all t-stat values reported are less the critical value. The null hypothesis is therefore accepted. There are no abnormal gains to health care sector shareholders on account of split announcements.

Table 1. Impact of stock split announcements on share price performance

Sector	Company Name	Event Date	Alpha α	Beta β	R ²	T-test
Auto	Tata Motors	26.6.2011	0.00104	1.48339	0.60165	0.01570
	M&M	25.1.2010	-0.00165	1.42806	0.60292	0.02337
Bankex	HDFC	7.6.2011	0.00032	0.79872	0.56122	0.01036
	Kotak	11.5.2010	-0.00006	1.20802	0.72979	0.01965
Consumer Durables	Titan	29.4.2011	0.00162	1.13981	0.63953	0.01323
	VIP	10.8.2011	0.00221	1.04999	0.21481	0.03157
	Bajaj	12.10.2009	0.00224	0.69687	0.25077	0.03709
FMCG	ITC	17.6.2005	-0.00022	1.21495	0.68643	0.00920
Health Care	Apollo	28.5.2010	0.00155	0.39584	0.03605	0.02471
	Aurobindo	3.11.2010	0.00002	1.18207	0.28135	0.01742
	Lupin	5.5.2010	0.00154	0.88759	0.21113	0.02117
	Sun	24.9.2010	0.00049	0.93646	0.32539	0.01294
	IPCA	21.1.2010	0.003498	0.41968	0.042094	0.02795
IT	Hexaware	21.2.2005	1.181E-05	0.42214	0.036381	0.02888
	Indian Infotech	3.2.2012	0.002922	0.28812	0.014052	0.03855

**signifies statistically significant at 5% level

Except for the -30 to -15 day event window, there were positive returns throughout the pre and post announcement period. Matching of the investors anticipations about split announcements and firms' declarations could be the cause for this trend. The CAR in the time intervals -30 to -15, -15 to -1, -1 to 0, 1 to 15 and 15 to 30 days were -0.68%, 3.49%, 2.63%, 3.31%, 6.17% and 6.99% respectively. The CAR T Stat values for all the various time intervals other than the -30 to -15 day time period were statistically significant. The null hypothesis, there is no value maximization is accepted for the time interval -30 to -15 and rejected for all other time periods.

The above exhibit shows the AR and CAR graphs of banking stocks around the stock split announcements. There were fluctuating gains and losses accruing to

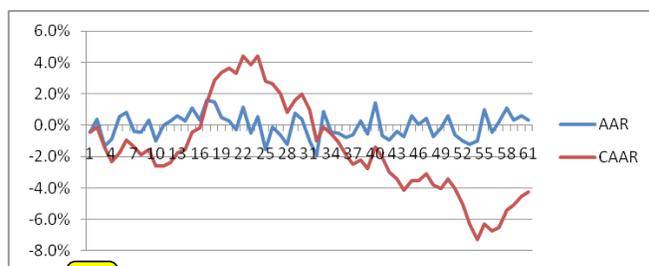


Figure 1. AR and CAR of auto firms declaring stock splits.

investors in the entire study period. The AR graph shows inconsistent positive and negative returns accruing to investors.

11.2.3 Consumer Durables Sector

AR Analysis: The CD sector reacted negatively ($t_0 = -0.3\%$) on the stock split announcement day. The t-tests confirm that the abnormal returns are insignificant as all t-statistics values are less than the critical value of 1.96. The null hypothesis, there are no abnormal gains to shareholders on stock split announcements by the CD sector firms, is thereby proved to be right and is accepted.

Stock split announcements were not eagerly looked forward to by the investing community in the entire pre-event window. There were marginal negative abnormal gains, in other words, losses to shareholders of CD sector due to stock split announcement. The CAR in the time intervals -30 to -15, -15 to -1, -1 to 0, 1 to 15 and 15 to 30 days were 1.97%, -0.08%, -0.34%, 1.41%, 9.1% and 9.56% respectively. The CAR T Stat values in the time intervals of 1 to 15 days and 15 to 30 days are statistically significant at 2.615 and 2.821 and not statistically significant in the rest of the time periods. Hence, it can

Table 2. AAR, CAAR and T-Test values of stock split stocks

Day	Auto			Bankex			Consumer Durables			HC			IT		
	AAR	CAAR	t test	AAR	CAAR	t-test	AAR	CAAR	t test	AAR	CAAR	t-test	AAR	CAAR	t test
-30	-0.5%	-0.5%	-0.1701	-0.9%	-0.9%	-0.7066	0.3%	0.3%	0.0707	1.3%	1.3%	1.3993	-0.7%	-0.7%	-0.3596
-29	0.3%	-0.1%	0.0081	-0.9%	-0.9%	0.0390	-1.3%	-1.1%	-0.4399	1.4%	2.7%	1.5590	-0.8%	0.3%	0.0197
-28	-1.3%	-1.4%	-0.7217	-0.1%	-1.0%	-0.0423	0.4%	-0.7%	0.1412	-0.3%	2.5%	-0.2756	-0.5%	-1.3%	0.0425
-27	-0.9%	-2.3%	-0.5489	-0.2%	-1.2%	-0.2430	2.3%	1.7%	0.5493	-0.4%	2.1%	-0.4118	-1.4%	-0.9%	-0.4739
-26	0.6%	-1.8%	0.2489	0.3%	-0.9%	0.5112	0.7%	2.4%	0.1179	0.9%	3.0%	0.9966	-0.9%	0.6%	0.3395
-25	0.8%	-1.0%	0.3264	0.2%	-0.7%	0.1322	-0.2%	2.2%	-0.1403	1.3%	4.3%	1.3751	-1.2%	0.8%	-0.1214
-24	-0.4%	-1.4%	-0.3324	1.2%	0.5%	0.8070	-0.7%	1.4%	-0.2421	-0.3%	3.9%	-0.3564	-2.3%	-0.4%	-0.5068
-23	-0.5%	-1.9%	-0.2623	0.3%	0.8%	0.0248	-0.4%	1.0%	-0.2448	0.4%	4.3%	0.4262	-1.8%	-0.5%	0.1590
-22	0.3%	-1.6%	0.2821	1.1%	1.8%	0.6769	1.1%	2.1%	0.2251	0.1%	4.4%	0.0988	-2.2%	0.3%	-0.2566
-21	-1.0%	-2.6%	-0.5426	-1.1%	0.7%	-0.6897	-0.5%	1.6%	-0.0962	0.1%	4.5%	0.0669	-1.9%	-1.0%	0.2255
-20	0.0%	-2.6%	-0.0611	-1.3%	-0.5%	-0.8658	-1.0%	0.6%	-0.3102	-0.1%	4.4%	-0.0829	-1.6%	0.0%	0.1316
-19	0.2%	-2.4%	0.1479	0.7%	0.2%	0.3622	1.6%	2.2%	0.8200	0.2%	4.6%	0.2298	-1.5%	0.2%	0.0396
-18	0.6%	-1.8%	0.4025	-0.4%	-0.2%	-0.1033	-0.3%	1.9%	-0.1872	0.5%	5.2%	0.5769	-2.2%	0.6%	-0.3830
-17	0.2%	-1.5%	0.1087	-1.6%	-1.7%	-0.8946	-0.5%	1.3%	-0.1331	0.2%	5.4%	0.2568	-2.2%	0.2%	0.0942
-16	1.1%	-0.4%	0.6318	0.6%	-1.2%	0.4480	0.8%	2.1%	0.0266	-0.2%	5.2%	-0.2393	-2.2%	1.1%	-0.0905
-15	0.3%	-0.2%	-0.0203	0.5%	-0.7%	0.7003	-0.1%	2.0%	0.0281	0.7%	5.8%	0.7184	-3.0%	0.3%	-0.4274
-14	1.6%	1.4%	0.7625	0.4%	-0.3%	0.4453	1.0%	2.9%	0.3502	-0.1%	5.7%	-0.1530	-3.1%	1.6%	-0.0445
-13	1.5%	2.9%	0.6192	-0.1%	-0.4%	0.0525	0.3%	3.3%	-0.0229	0.4%	6.1%	0.4181	-3.1%	1.5%	-0.0654
-12	0.5%	3.4%	0.2662	-0.2%	-0.6%	0.1418	-1.3%	2.0%	-0.4483	-0.5%	5.6%	-0.5325	-4.1%	0.5%	-0.4216
-11	0.2%	3.6%	0.1331	0.4%	-0.2%	0.2059	-1.1%	0.9%	-0.4766	-0.7%	4.9%	-0.7492	-3.0%	0.2%	0.5718
-10	-0.3%	3.3%	-0.1505	-0.2%	-0.4%	-0.2891	-0.5%	0.3%	-0.0582	-2.0%	2.9%	-2.2199	-3.0%	-0.3%	0.2982
-9	1.1%	4.4%	0.4412	-0.2%	-0.6%	-0.0380	-1.3%	-0.9%	-0.3917	1.2%	4.1%	1.3159	-3.1%	1.1%	-0.1231
-8	-0.5%	3.9%	-0.1452	-1.6%	-2.2%	-0.8538	-0.6%	-0.6%	-0.0703	-2.0%	2.1%	-2.1674	-2.9%	-0.5%	0.2724
-7	0.5%	4.4%	0.2042	0.0%	-2.2%	-0.1270	0.5%	-1.1%	0.2120	-0.2%	1.8%	-0.2504	-1.9%	0.5%	0.4012
-6	-1.6%	2.8%	-0.9007	0.3%	-1.8%	0.1742	-1.1%	-2.1%	-0.2296	-0.4%	1.5%	-0.4028	-0.6%	-1.6%	0.6019
-5	-0.2%	2.6%	-0.0658	1.4%	-0.4%	1.0984	-1.6%	-3.8%	-0.6090	0.7%	2.2%	0.7545	-0.6%	-0.2%	0.0744
-4	-0.6%	2.0%	-0.3605	1.2%	0.7%	0.5516	-0.2%	-4.0%	0.0278	-0.9%	1.3%	-0.9496	-0.6%	-0.6%	-0.0264
-3	-1.2%	0.8%	-0.5994	1.8%	2.6%	1.7225	1.4%	-2.6%	0.4834	0.3%	1.6%	0.3700	-0.9%	-1.2%	-0.0188
-2	0.8%	1.6%	0.2671	-0.3%	2.2%	-0.1671	3.2%	0.6%	0.9015	-0.4%	1.2%	-0.4828	2.4%	0.8%	0.0476
-1	0.4%	2.0%	0.2830	1.3%	3.5%	0.7848	-0.7%	-0.1%	-0.1897	0.2%	1.4%	0.1802	2.3%	0.4%	0.2123
0	-1.0%	1.0%	-0.4127	-0.9%	2.6%	-0.4477	-0.3%	-0.3%	-0.2169	-0.1%	1.3%	-0.0907	3.3%	-1.0%	0.5180
1	-2.0%	-1.0%	-1.3921	0.7%	3.3%	0.2237	1.7%	1.4%	0.3588	0.3%	1.5%	0.2893	-0.1%	-2.0%	0.0476
2	0.9%	-0.1%	0.4992	0.3%	3.7%	0.2464	-0.3%	1.1%	-0.2173	-1.1%	0.4%	-1.2100	3.4%	0.9%	0.2483
3	-0.5%	-0.6%	-0.2196	0.3%	3.9%	0.2265	2.4%	3.5%	0.8457	0.5%	0.9%	0.5629	2.9%	-0.5%	-0.1127
4	-0.5%	-1.1%	-0.3600	1.9%	5.8%	1.0782	1.8%	5.3%	0.7609	-0.4%	0.5%	-0.4588	3.1%	-0.5%	0.1905
5	-0.8%	-1.9%	-0.4782	0.1%	5.9%	-0.0163	0.8%	6.1%	0.2575	-1.4%	-0.9%	-1.5094	2.8%	-0.8%	-0.2158
6	-0.6%	-2.5%	-0.4652	0.3%	6.2%	0.3216	1.0%	7.1%	0.3360	0.7%	-0.2%	0.7209	3.8%	-0.6%	0.3340
7	0.3%	-2.2%	0.1899	-0.7%	5.5%	-0.5454	-0.8%	6.3%	-0.3324	-0.8%	-1.0%	-0.8634	3.0%	0.3%	-0.4416
8	-0.6%	-2.8%	-0.2656	0.1%	5.6%	0.0958	0.1%	6.3%	0.0258	0.3%	-0.7%	0.2996	1.9%	-0.6%	-0.5399
9	1.4%	-1.4%	0.7280	-0.5%	5.1%	-0.5402	0.0%	6.4%	-0.0147	0.5%	-0.2%	0.5530	2.1%	1.4%	0.0999
10	-0.7%	-2.0%	-0.2852	1.5%	6.6%	1.0546	-0.1%	6.3%	0.0406	0.0%	-0.2%	0.0391	2.4%	-0.7%	0.1821
11	-1.0%	-3.0%	-0.3860	-0.6%	6.0%	-0.3820	-0.1%	6.2%	0.0353	0.2%	0.0%	0.1917	1.9%	-1.0%	-0.2981
12	-0.4%	-3.4%	-0.2874	-0.8%	5.3%	-0.3720	1.1%	7.3%	0.4510	0.4%	0.4%	0.4510	2.5%	-0.4%	0.3385
13	-0.8%	-4.2%	-0.6114	0.0%	5.2%	-0.1338	-1.6%	5.7%	-0.4810	0.0%	0.4%	0.0072	1.7%	-0.8%	-0.3527

(Continued)

Table 2. (Continued)

Day	Auto			Bankex			Consumer Durables			HC			IT					
	AAR	CAAR	t test	AAR	CAAR	t test	AAR	CAAR	t test	AAR	CAAR	t test	AAR	CAAR	t test			
14	0.6%	-3.6%	0.3675	-0.6%	4.6%	-0.2705	2.1%	7.8%	0.7822	1.4%	1.9%	1.5614	0.0%	1.6%	-0.0020	0.6%	45.1%	-0.3712
15	0.0%	-3.5%	0.0334	1.5%	6.2%	0.7965	1.3%	9.1%	0.3199	0.3%	2.2%	0.3614	-0.1%	1.6%	-0.0993	0.0%	45.6%	0.0783
16	0.4%	-3.1%	0.3042	0.3%	6.4%	0.5556	0.2%	9.3%	0.3108	-0.1%	2.1%	-0.1185	-0.7%	0.9%	-0.2300	0.4%	45.3%	-0.1756
17	-0.7%	-3.8%	-0.4871	-0.8%	5.6%	-0.4068	-0.6%	8.7%	-0.1680	0.7%	2.8%	0.7979	-0.4%	0.5%	-0.2586	-0.7%	45.5%	0.0329
18	-0.2%	-4.0%	-0.0619	-1.1%	4.5%	-0.6455	0.9%	9.6%	0.3166	0.2%	3.0%	0.1897	0.7%	1.2%	0.2667	-0.2%	46.0%	0.1369
19	0.6%	-3.4%	0.2185	1.3%	5.8%	0.7788	-1.3%	8.3%	-0.6769	1.1%	4.1%	1.1989	0.3%	1.5%	0.3042	0.6%	47.1%	0.3126
20	-0.6%	-4.0%	-0.2249	-0.2%	5.7%	-0.0797	0.4%	8.7%	0.0199	-0.4%	3.7%	-0.4688	-0.7%	0.7%	-0.2627	-0.6%	47.2%	-0.1558
21	-1.0%	-5.0%	-0.6819	0.0%	5.6%	0.1929	-0.4%	8.3%	-0.0042	-2.2%	1.4%	-2.4357	-0.6%	0.2%	-0.2796	-1.0%	50.0%	0.7981
22	-1.2%	-6.3%	-0.6377	-0.2%	5.4%	-0.1606	0.6%	8.8%	0.1717	-1.5%	-0.1%	-1.6620	-1.1%	-1.0%	-0.5044	-1.2%	52.6%	0.7183
23	-1.0%	-7.3%	-0.5046	0.3%	5.7%	0.3069	-0.7%	8.1%	-0.4015	-0.6%	-0.7%	-0.6137	-0.4%	-1.4%	-0.1631	-1.0%	54.6%	0.4883
24	1.0%	-6.3%	0.5301	0.2%	5.9%	0.0297	-0.1%	8.0%	-0.0981	-0.5%	-1.1%	-0.4979	-0.2%	-1.5%	0.0269	1.0%	58.1%	0.9931
25	-0.4%	-6.7%	-0.2767	-0.5%	5.5%	-0.4412	-0.5%	7.6%	-0.1927	0.1%	-1.1%	0.0804	-0.6%	-2.2%	-0.3294	-0.4%	59.6%	0.3310
26	0.2%	-6.5%	0.1266	-0.4%	5.0%	-0.1037	0.3%	7.9%	0.1581	0.9%	-0.1%	1.0214	1.1%	-1.1%	0.6703	0.2%	59.5%	-0.0711
27	1.1%	-5.4%	0.4970	80.9%	5.9%	0.0277	-0.4%	7.5%	-0.1106	-0.3%	-0.5%	-0.3625	0.1%	-1.0%	-0.0583	1.1%	60.9%	0.3525
28	0.3%	-5.1%	0.0408	0.5%	6.4%	0.4074	-0.2%	7.2%	-0.0976	-0.9%	-1.3%	-0.9582	0.8%	-0.2%	0.5406	0.3%	66.0%	1.5697
29	0.6%	-4.5%	0.3334	0.7%	7.1%	0.5902	0.6%	7.8%	0.2990	-2.3%	-3.6%	-2.4557	1.1%	0.9%	0.5234	0.6%	66.9%	0.0908
30	0.3%	-4.3%	0.0763	-0.1%	7.0%	-0.3477	1.7%	9.6%	0.6790	0.2%	-3.4%	0.2621	0.5%	1.3%	0.1700	0.3%	67.9%	0.2224

Table 3. Value creation of stock split declaring auto firms

Through	CAR	CAR T Stats
-30	-15	-0.16%
-15	-1	1.97%
-1	0	0.98%
0	1	-0.99%
1	15	-3.53%
15	30	-4.25%
Number of firms in the sample		2

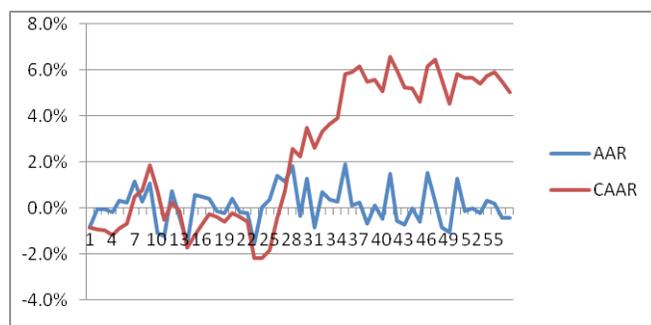
be concluded that shareholders' value increased in the 30 day period after the stock split announcement.

The above exhibit shows the AR and CAR graphs. There were fluctuating gains and losses accruing to investors in the entire study period. The AR graph shows inconsistent positive and negative returns accruing to investors.

11.2.4 FMCG Sector

AR Analysis: The FMCG sector reacted negatively ($t_0 = -0.1\%$) on the stock split announcement day. With all the t-statistics values being less than the critical value at 5% significance level, the abnormal returns are not significant. It can therefore be concluded that the shareholders have not gained abnormally on account of split announcements by the FMCG sector firms, the null hypothesis that there are no abnormal gains to shareholders, is accepted.

Modest positive CAR was recorded till t15 day. Negative CAR was reported in the last time window of 15-30 days. The CAR in the time intervals -30 to -15, -15 to -1, -1 to 0, 1 to 15 and 15 to 30 days were 5.83%,

**Figure 2.** AR and CAR of banking firms declaring stock splits.

1.35%, 1.27%, 1.53%, 2.18%, and -3.36% respectively. The CAR T Stat values in the time windows of -30 to -15, 1 to 15 and 15 to 30 were 6.338, 2.374 and -3.648 respectively, more than the critical values and therefore statistically significant. The null hypothesis, there is no value maximization to shareholders on split announcements by the FMCG sector firms is rejected for these 3 time periods. Positive gains accrued to investors in the time frame of -30 to -15 days and 1 to 15 day window and there was some value loss in the last window of 15 to 30 days.

In the remaining time intervals of -15 to -1, -1 to 0, 0 to 1, the T Stat values are less than the critical value, hence the null hypothesis is accepted for these time periods. No value maximization occurred to shareholders in these time intervals.

The above exhibit shows that there were fluctuating gains and losses accruing to FMCG investors in the entire 30 day study period. The CAR graph shows initial increases followed by declines only to recover and fall again later.

11.2.5 Health Care Sector

AR Analysis: The HC sector reacted positively ($t_0 = 0.9\%$) on the stock split announcement day. The t-tests confirm that the difference between the calculated values and critical values as insignificant with all t-statistics reported being way below the critical value of 1.96. The null hypothesis, the shareholders do not gain by split announcements of FMCG firms, is accepted.

Except for the pre-event window of -30 to -15 day, there were modest positive returns throughout the pre and

Table 4. Value creation of stock split declaring banking firms

Through	CAR	CAR T Stats
-30	-15	-0.68%
-15	-1	3.49%
-1	0	2.63%
0	1	3.31%
1	15	6.17%
15	30	6.99%
Number of firms in the sample		2

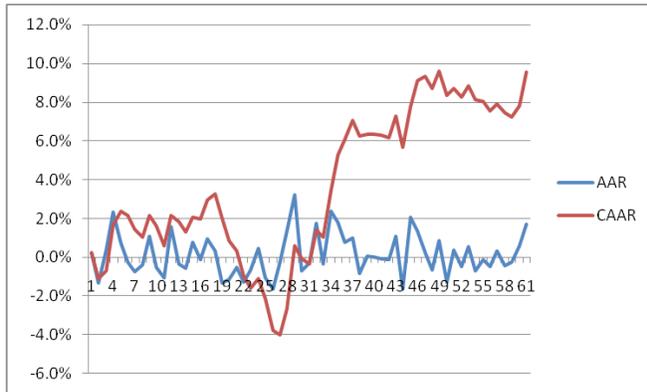


Figure 3. AR and CAR of CD firms declaring stock splits.

Table 5. Value creation of stock split declaring CD firms

Through	CAR	CAR T Stats
-30 -15	1.97%	0.1852
-15 -1	-0.08%	-0.3363
-1 0	-0.34%	-0.5533
0 1	1.41%	-0.1945
1 15	9.10%	2.6151**
15 30	9.56%	2.8206**
Number of firms in the sample		3

Table 6. Value creation of stock split FMCG declaring firms

Through	CAR	CAR T Stats
-30 -15	5.83%	6.3378**
-15 -1	1.35%	1.4687
-1 0	1.27%	1.3781
0 1	1.53%	1.6674
1 15	2.18%	2.3742**
15 30	-3.36%	-3.6484**
Number of firms in the sample		1

post announcement period. Matching of the investors anticipations about split announcements and firms' declarations could be the cause for this trend. The CAR in the time intervals -30 to -15, -15 to -1, -1 to 0, 1 to 15 and 15 to 30 days were -2.96%, 2.33%, 3.27%, 3.19%, 1.55% and 1.34% respectively. The CAR T Stat values for all the various time intervals were not statistically significant. The null hypothesis is therefore accepted. There was no value maximization to shareholders.

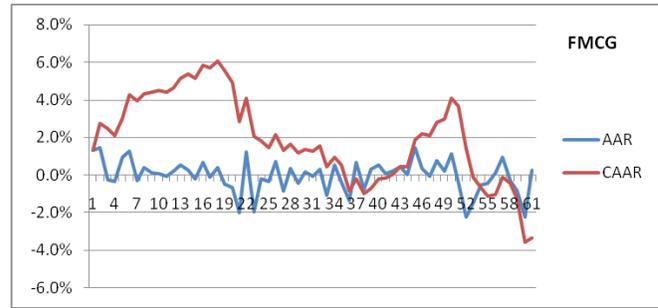


Figure 4. AR and CAR of FMCG firms declaring stock splits.

The above exhibit shows the AR and CAR graphs. There were fluctuating gains and losses accruing to investors in the entire study period. The CAR graph shows inconsistent positive and negative returns accruing to investors with declines and advances.

11.2.6 IT Sector

AR Analysis: The IT sector reacted positively ($t_0=4.2\%$) on the stock split announcement day. There is not much of a difference between calculated T stat values and critical values; the null hypothesis therefore is accepted. There are no abnormal gains to IT sector shareholders on account of stock split announcements.

There were positive returns throughout the pre and post announcement period. Matching of the investors anticipations about split announcements and firms' declarations could be the cause for this trend. The CAR in the time intervals -30 to -15, -15 to -1, -1 to 0, 1 to 15 and 15 to 30 days were 22.06%, 34%, 38.16%, 38.7%, 45.62% and 67.88% respectively. The CAR T Stat values for all the various time intervals were statistically

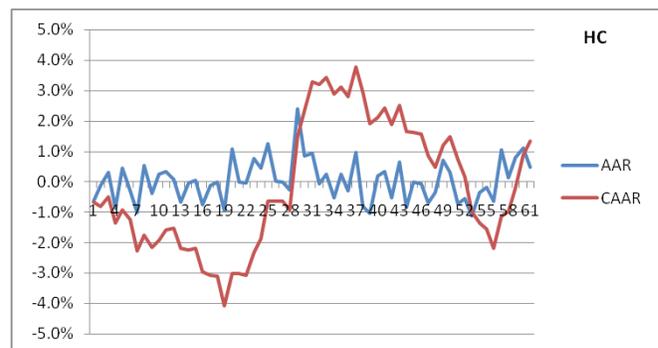


Figure 5. AR and CAR of HC firms declaring stock splits.

Table 7. Value creation of stock split declaring HC firms

Through	CAR	CAR T Stats
-30 -15	-2.96%	-1.5675
-15 -1	2.33%	1.2776
-1 0	3.27%	1.7956
0 1	3.19%	1.8432
1 15	1.55%	1.1745
15 30	1.34%	1.5903
Number of firms in the sample	5	

significant. As there is value maximization to shareholders of IT sector firms, the null hypothesis is rejected.

The above exhibit shows the AR and CAR graphs. Abnormal gains were seen to be fluctuating in the entire study period. The CAR graph shows constant advances touching 68% by the end of the event window.

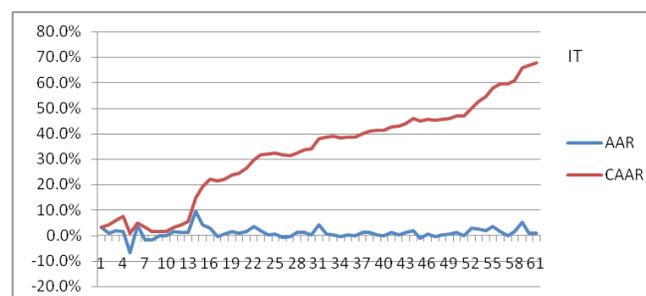
In general, market reaction is instantly known by the share price reaction to stock split announcements. Investors greet the announcements by increased trading volumes and there are excess returns during the days surrounding a split announcement. The auto, banking, consumer durables and FMCG stocks reacted negatively on the day of the split announcement, positive abnormal returns were seen in the while health care and IT stocks. On the immediate pre announcement day, there were positive reactions in the market. The auto, banking, FMCG, HC and IT stocks had a positive AAR on the previous day while the CD stocks reacted negatively.

12. Conclusion

In a symmetrically informed market, all participants, such as managers, shareholders, brokers and prospective investors have similar information about a firm. They all have related kind of information about the firm's current situation and future prospects. If any one group possesses some additional information about the firm, informational asymmetry exists. It is widely believed by stock market experts that managers possess superior information about their firms as compared to other parties. Stock splits are reported by the media regularly. Share markets react to such information and

Table 8. Value creation of stock split declaring IT firms

Through	CAR	CAR T Stats
-30 -15	22.06%	6.6060**
-15 -1	34.00%	9.8832**
-1 0	38.16%	11.3487**
0 1	38.70%	11.5098**
1 15	45.62%	13.1091**
15 30	67.88%	18.7533**
Number of firms in the sample	2	

**Figure 6.** AR and CAR of IT firms declaring stock splits.

security prices increase following split announcements. Understanding stock market behaviour around corporate events helps investors to beat the market and earn abnormal returns.

This study aims to investigate whether investors of BSE stocks gained significantly on account of stock split announcements made by firms. The results of the study indicate that there were significant positive abnormal returns prior to split announcements. On the announcement day, the average abnormal returns are positive for the HC sector at 3.3% and negative for all the other sectors (Auto -1%, Bankex -0.9%, CD -0.3%, FMCG -1%, and IT-1%). There is no consistent pattern of abnormal returns of companies declaring splits for 30 days before the announcement date. The AAR is positive on some days in the pre event window which may be due to information leak from the companies' board. The T test analysis of AR shows that there is no statistical evidence to accept the semi-strong form of market efficiency in the BSE sectors selected for the study. Abnormal gains have not accrued to shareholders of any sector.

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