Behaviour of Share Prices Around Ex-Split Day of Stock Splits in India

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ABSTRACT

Stock split is a corporate decision in which company divides face value of the equity share into more than one unit. Theoretically stock splits should not have any effect on share prices and stock returns. The present study has attempted to examine the behaviour of share prices around the ex-split day of the stock splits announcement. This effect of stock splits announcements on the share prices is studied by analysing the behaviour of abnormal returns around stock splits of 304 companies listed on BSE, during the period 1999 to 2018. The analysis stresses on finding whether stock splits have an impact on share prices. This impact of stock splits is studied using abnormal returns. The event study is a methodology used to study share price behaviour around specific events and share price reaction to such events as stated by Binder (1998). This effect has been analysed around the event - ex-split day. To test the impact of stock splits - AAR (Average Abnormal Returns) and ACAR (Average Cumulative Abnormal Returns) are computed.

The presence of positive AARs with significant Z_s-values on t-1 day in pre-ex-split day window implies that informed traders anticipating a price increase on ex-split day buy shares before the ex-split day to make fast profit. In post-ex-split day window positive AARs with significant Zs-values are present on t+1 day probably because of lower share prices after ex-split day. The AARs are negative with significant Z_s-values in post event window till t_{+17}.It implies that in the Indian stock market there is presence of significant negative wealth effect in post ex-split day window not in line with findings of Angel (1997) and Schultz (2000) . ACARs are negative and

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continuously decreasing throughout the event window. The statistical significance of ACARs is tested using Z-statistic. The ACAR do not have significant Z-value in the event window.

Significant abnormal returns were found to be present around the ex-split day though for a very short duration of time. The current study suggests that the investors while planning their investment or trading portfolio, must decide a time horizon for a stake in shares subjected to split, so that they take advantage of the fact that share prices do not adjust fully in proportion to split ratio immediately on and after ex-split day. The benefit must be availed quickly since the impact of stock splits is found to be present for a short time duration.

Keywords: **Stock Splits, Return, Abnormal Return, Ex-split Day, Event Study Methodology, Average Cumulative Abnormal Return.**

1. INTRODUCTION

Stock split is a corporate decision in which company divides face value of the equity share into more than one unit. Stock splits add no value but increases number of shares.

A stock split increases the number of shares outstanding by reducing the face value of equity shares, without affecting the equity. It must be noted that stock splits is different from stock dividend and bonus issues. In case of stock dividend equity capital of company increases and there is no actual cash outflow. Only reserves are reduced with an equivalent increase in share capital.

In Indian stock market 'Stock split' is also termed as subdivision of shares.Before 1999, stock splits were an occasional feature in Indian capital market. It was mandatory for equity share to be of denomination of Rs.10 or Rs.100 on or before December 31, 1983[1].This concept of fixed par value was changed by Securities Exchange Board of India (SEBI) in 1999[2]. As a

[1] Ministry of Finance, vide Circular No.1/7/SE/81 dated January 22, 1983 had restricted change of face value at denomination lower than Rs.10 keeping them fixed at Rs.10 or Rs.100.

[2] SMDRP/ Policy/ Cir-16/ 99 dated June 14, 1999 provided companies freedom to issue shares in any denomination to be determined by them as long as it is not fractional by amending their Memorandum and Articles of Associations.

result companies were able to split their shares into shares of any denomination other than a fraction of a rupee. Dematerialization of shares acted as added facilitators for stock splits. The companies are now permitted to issue shares in any denomination other than in decimal of a rupee.In India, it is the limited companies which are allowed to announce stock splits and reduce face value, after amending MOA as per section 61(1)(d)[3] of the Companies Act 2013.

The companies should conform to the requirements of SEBI and stock exchanges before the Stock Split.

Fama et al. (1969) in their research used market model on monthly return. An average abnormal return (AAR) of 34.07% was found before ex-split day but no abnormal returns (ARs) were observed after the ex-split date. They also documented that months immediately after splits reflect market anticipation of a substantial increase in the dividend. They supported signalling hypothesis but using it could not explain why ARs were observed around ex-split day. Fama et al. (1969) suggested that in reacting to stock splits market responds only to its dividend implications. They stated that stock splits are often followed by increased cash dividend declared within a short time in soon. Louis and Robinson (2003) were of view that managers or supervisors announce stock splits if they are positive about future expectations and extract a positive response from investors.

Elfakhani and Lung (2003) found positive significant AARs in Canada during period 1977-93. Empirical proof suggested that an inverse relationship existed between the size of company and returns. Byun and Rozeff (2003) examined long-run impact of 12,747 stock splits covering period from 1927 to 1996 and found that stock splits were value-neutral transactions because they observed negligible ARs. They calculated weighted post split CARs. Their results were based on a variety of sub periods and methodologies.

2. REVIEW OF LITERATURE

Stock splits are said to be complicated happenings for researchers where in theory and practice are contrary to each other. The present literature review

[3] The section replaces sec 94(1) (d) of the Companies Act 1956.

offers different arguments to explain the unprecedented consequences of stock splits. It begins with pioneering paper by Fama et.al (1969) which examined behaviour of cumulative abnormal returns (CARs) around ex-split day of stock splits. Theoretically stock splits do not lead to a change in market capitalization, but still, the literature review puts forth several interesting effects of stock splits. There are many hypotheses in literature that attempt to explain behaviour of share prices around stock splits. The empirical studies in the past have tested different theories and established them as possible reasons for the significant impact on share prices around stock splits. The same are discussed below:

1. **Optimal trading range hypothesis**: it was proposed by Copeland (1979) and stated that there is a price range in which trading of shares of a company is most favourable for a company.

2. **Signalling hypothesis**: The hypothesis is based on assumption that there is information asymmetry between managers and investors of the company. Fama, Fisher, Jenson, and Roll (1969), Lakonishok and Lev (1987), Brennan and Copeland (1988) and; Asquith, Healy, and Palepu (1989) supported this hypothesis. Dividend hypothesis is a variation of signalling hypothesis.

3. **Optimal tick size hypothesis:** Angel (1997) introduced the optimal tick size hypothesis. According to Easley, O'Hara and Saar (2001) stock splits are used to move share prices into optimal range of tick size. In India, the tick size is minimal about five paisa only in majority of stock exchanges. Thus like other global markets, one of the primary reasons to go for stock splits in India cannot be to attain optimum tick size.

4. **Tax timing hypothesis**:it was introduced by Lamoureux and Poon (1987). According to the researchers stock returns are comparatively more volatile after a stock split and shares which are split, attain higher importance for tax-purposes.

5. **Neglected-firm hypothesis:** Arbel and Swanson (1993) in relation to neglected-firm hypothesis states that stock splits are used to draw attention of investors to the company and gain recognition.

6. **Self- selection hypothesis**: it was suggested by Ikennberry, Rankin, and Slice (1996) and states that managers use stock splits to move share

prices in a desired trading range. However, they condition their decision to split based upon expectations about future performance of the company.

7. **Manipulation hypothesis**: According to this hypothesis stock splits is a means to manipulate share prices before events like mergers, acquisitions ,public offers etc. as suggested by D'Mello, Tawatnuntachai and Yaman (2003)[4].

8. **Dispersion of control energy or enlarge clientele hypothesis:** According to this hypothesis company reduces share prices in order to disperse their ownership among larger investors and attract small investors that are not in a position to control the company (Demsetz and Lehn, 1985).

Besides the above explanations the different studies in past in India have also reported specific empirical results. In India Budhraja, Parekh and Singh (2004) studied stock splits of companies listed on BSE (Bombay Stock Exchange). They found ARs around bonus issue and stock splits announcement day over three day trading period. Mishra (2007) taking a period of 1999-2005, concluded negative effect of stock splits on share prices and returns. Gupta and Gupta (2007) reported no positive AARs associated with announcement of stock splits. They found negative AAR of –0.5% on announcement day (low and insignificant).However, the following day exhibited an AAR of 1.7% (significant) again followed by significant negative ARs.

Dhar and Chhachhoaria (2008) supported signalling hypothesis as they found significant positive announcement affect for splits. Their findings differ from that of Gupta and Gupta (2007).Joshipura (2008) analysed presence of any ARs on or around split announcement and ex-split day. Ray (2011) reported significant positive AR on announcement day of stock splits and also reported significant improvement in liquidity post-split.Kumar and Halageri (2011) concluded that share prices reacted to announcement of stock splits for a very few days starting from announcement day and up to 15

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[4] D'Mello, Tawatnuntachai and Yaman (2003) were of view that stock splits is used to increase share prices to a higher level before company sells new shares to raise more funds.

days after announcement day. Chakraborty (2011) found no statistically significant ARs on and around announcement day. Ghatak (2011) aimed to examine share price reaction to the announcement of bonus issues or stock splits using the event study methodology. Kumar and Halageri (2013) concluded that significant ARs are associated with stock splits. Suresha and Naidu (2013) found significant positive ARs on announcement day (AD), but only for a short run. They found significant CAARs. Thirunellai (2013) aimed to examine the impact on the liquidity of the companies that go for a split; the trading range hypothesis; the signaling hypothesis and the multiple events hypothesis. The results of the study indicated that in the companies announcing the stock splits earned only insignificant excess returns along with an increase in the liquidity.

Bhuvaneshwari and Ramya (2014) suggested that stock splits have positive impact on share prices around the announcement day. Kumar (2014) showed that there is no wealth maximization effect and no positive ARs in the Indian markets.

Bodhanwala (2016) tried to explore the rationale behind the corporate actions of share split and reverse split and the impact ofsuch action on liquidity and price of shares for the period between 2006 and 2014. The results suggested that there is an optimal price for the shares, at which they appear to be the best value for money. The researchers were also of view that the splitting of shares substantially increases the wealth of shareholders, but no such conclusion could be drawn from reverse splitting.

Ansary and Hussien (2017) studied the impact of stock split on the share prices, liquidity, and volatility. They also tested the market efficiency of the stock market in response to the announcement of split and dividend declaration. They used the "Event Study" approach to assess the impact of these corporate actions on the stock performance around the announcement day (for a period of 30 prior and 30 days post announcement). They suggected that the announcement of both stock splits and stock dividend has a positive impact on share prices.

3. RESEARCH PROBLEMS

From the above literature review it was inferred that there is no consensus on how markets react to stock splits. This study intends to fill literary gaps in

previous findings by providing a comprehensive study that examines behaviour of abnormal returns around stock splits (ex-split day) restricted to India.

4. RESEARCH HYPOTHESIS

Based upon different hypotheses enumerated above which suggests possible reasons for presence of significant impact of stock splits following research hypotheses developed:

- **HYP:1**- Stock splits have impact on ARs on and around ex-split day.
- **HYP:2**- Proportion of positive ARs is equal to proportion of negative ARs around ex-split day.

5. RESEARCH METHODOLOGY

To test the hypotheses enumerated above following research methodology has been designed.

a. Data and sampling period: The sample of companies is drawn from a population comprising of all companies listed on Bombay Stock Exchange (BSE) that went for stock splits during the period starting from 1999 to June 2018.The dates of ex-split day are taken from Prowess database, Capital line and press reports of Economic Times. Non–availability of share prices data and other related limitationsrestricted the size of sample to 304 companies.

b. Sources of data: For secondary data collection Prowess 19.1, a CMIE database was accessed for- daily closing share prices data of sample companies around ex-split dayto find impact on abnormal returns .BSE Sensex has been used as proxy for market portfolio and data for same was collected from Prowess 19.1.

c. Research tools and techniques: Standard Event study methodology, as developed by Fama, Fisher, Jenson and Roll (1969) and Brown and Warner (1985), has been used in current study to find impact of stock splits on share prices. Lo and MacKinlay (2004) and Binder[5] (1998) claim that the event study has most successful application in area of corporate finance.Ball &

[5] The event study is a methodology used to study share price behaviour around specific events and share price reaction to such events as stated by Binder (1998).

Brown (1968) and Fama et al.(1969) are credited with seminal work to examine the impact of an economic event or news on share prices in response to the event using this methodology. The most often cited resources relating to event study are - Brown and Warner (1980), Brown and Warner (1985),Corrado (1989), Cowan (1992),Kothari and Warner (1997), Campbell (1997) andBinder (1998).

d. Different Analysis Periods: The event day is assigned time t_0.The event of interest for current study is stock splits.The **event period or window** proposed in current study are - ED[7] (–) 20 to ED (+) 20 .**Estimation period or window** of 160 days starting from t_{-181} till t_{-21} before the event window is used in current study.

e. Event Study–Model : The present study uses Market model which is suggested as most popular and powerful[8] model of event study to measure ARs for the event window. The ARs, AARs, CAARs and other measures are computed for event window using following:

Step a: Daily returns for each sample company

The daily return for each sample company is calculated for the estimation window and for event window using:

$$R_{it} = log(P_{it} - P_{i(t-1)}) \quad (1)$$

Where, $P_{it}$and $P_{i\,(t-1)}$are respective daily closing share prices for company i at day t and $t_{-1,}$

R_{it} is actual return for company i at day t.

Step b: Daily returns for market

The daily returns for market are computed using daily values of BSE sensex (proxy for the market portfolio) for the same period using:

$$R_{mt} = log(I_{it} - I_{i(t-1)}) \quad (2)$$

Where, $I_{it}$and $I_{\,i(t-1)}$are respective daily index values at time t and t_{-1}

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[7] ED – Ex-split Day is the effective day on which share starts trading in the stock market at new face value after stock split.

[8] Brown and Warner (1985) concluded that methodology based on Market model is well specified and relatively powerful under a variety of conditions.

respectively,

R_{mt} is Return of Market portfolio for the period.

Step c: Abnormal returns calculation:

Abnormal return is defined as actual return (R_{it}) minus normal return (Nr_{it}).

$$AR_{it} = R_{it} - NR_{it} \quad (3)$$

Normal Return is calculated using Market model which is –

$$R_{it} = a_i + b_i R_{mt} + \varepsilon_{it}$$

$$\text{And, } Nr_{it} = \hat{a} + \hat{b}_i R_{mt} \quad (4)$$

R_{mt} is return on the market index for day t. α_i measures mean returns not explained by the market. β_i measures the sensitivity of return (company i) to the market return and ε_{it} is the statistical error whose expectation is assumed to be zero.

Using Eq.(3) and Eq.(4), abnormal returns are defined as residuals or prediction errors of model which is as under:

$$AR_{it} = R_{it} - NR_{it} = R_{it} - (\hat{a} + \hat{b}_i R_{mt}) \quad (5)$$

Where, $\hat{a}$ and $\hat{b}$ are OLS estimators of the regression coefficient estimated over estimation window.

To eliminate effect of any one or group of shares on ARs, ARs (Abnormal returns) are aggregated and averaged for each day in the event window. The un-weighted cross-sectional AARs in period *t* are calculated using:

$$AAR_{it} = \frac{\sum_{i=1}^{N} AR_{it}}{N} \quad (6)$$

Where, N is number of shares for which ARs are present on day't' in the event window.

Step f: Significance test for AAR

Large deviation of AARs from zero indicates the abnormal performance.

The null hypothesis tested is –

$$H_o : E(AAR_{it}) = 0$$

Z-test is used to test statistical significance of AARs on an event day.s is unknown and estimator of s can be constructed from cross-sectional variance of ARs in period *t*. The *Z*-statistics is calculated as under:

$$Z = \sqrt{N}\left(\frac{AAR_{it}}{s_t}\right) \sim N(0, 1) \quad (7)$$

If AARs are other than zero and statistically significant, it indicates that share prices on an average behave positively or negatively to stock splits and have an impact on shareholders wealth.

Step g: SAR and Significance Test

The assumption that variance of all ARs is equal for all companies is not likely to be true. Some shares may be more volatile than others lowering power of *Z*-test. Therefore, weighted average of ARs can be taken which puts lower weight on ARs with high variance.

Reciprocal of estimated standard deviation[10] of ARs of estimation window can be used as the weights to calculate SARs of individual company in following way:

$$SAR_{it} = \sum_{i=1}^{N} \frac{AR_{it}}{s_t} \text{ And} \quad (8)$$

$$ASAR_{it} = \frac{1}{N}\sum_{i=1}^{N} SAR_{it} = \frac{1}{N}\sum_{i=1}^{N} \frac{AR_{it}}{s_i} \quad (9)$$

Step h: Significance Test for SAR

The $ASAR_{it}$ is cross sectional average of SARs. The ASARs is assumed to be uncorrelated across companies and used to test the null hypothesis:

$H_o : E(ASAR_{it}) = 0,$

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[9] Z-test assumes that AARs are independently and identically distributed, have same mean and variances and are cross-sectionally uncorrelated

[10] Standard deviation of ARs for each sample company is computed for estimation period starting from t_{-181} and till t_{-21} days. The purpose of standardization is to ensure that ARs of a particular share has same variance. Each residual (AR) will have estimated variance as 1. The hypothesis to be tested is that Average Standardized ARs aggregated for all companies across time are equal to zero. The method of standardization is often attributed to Patell (1976).

For which following *Z*-statistic is constructed:

$$Z_s = \sqrt{N}(ASAR_{it}) = \frac{1}{\sqrt{N}}\left(\sum_{i=1}^{N} SAR_{it}\right) \quad (10)$$

Step i: Cumulative abnormal returns (CARs)

CARs are an useful tool to study effect of corporate announcements on share prices in case returns of companies are affected by leakage of information relating to announcement of the event (Mc Kinlay, 1997).In most of the studies AARs and CAARs, are used as measures to detect presence or absence of abnormal returns around stock split announcement day. It is often observed that there is leakage of information in the pre-announcement period. Therefore in the present analysis CARs are calculated.

To study impact of the event, not just on event day but also around the event, ARs are accumulated from start of event period t_1 up to t_2 in event window as under:

$$CAR_i = AR_{i,t1.} + \cdots .. + AR_{i,t2} = \sum_{t=t1}^{t2} AR_{it} \quad (11)$$

The null hypothesis tested is that:

$H_o : E(CAR_i) = 0$

Just like ARs, CARs for event day *i* are calculated for each company and then cross-sectional average is calculated as under:

$$ACAR_{it} = \frac{1}{N}\left(S_{i=1}^{N} CAR_{it}\right) \quad (12)$$

Where, CARit is cumulative abnormal return for a company on event day i. N is number of sample companies.

The *Z*-test is conducted to test significance of CARs using:

$$Z = \ddot{O}N\left(\frac{ACAR_{it}}{s}\right) \gg N(0, 1) \quad (13)$$

Where, N is number of sample companies. *s* is standard deviation on event day *i*.

CARs are mutually uncorrelated and *Z*-statistics approximately has standard normal distribution for large N.CAR on each event day is assumed to be normal, independent and identically distributed.

Step j: SCAR and Significance Test

CARs for each company are standardized over the event window and SCAR[11] it is calculated as under:

$$SCAR_{it} = \frac{CAR_{it}}{s_i} \quad (14)$$

Where, estimate of standard deviation of CARit, si for company i over the estimation period (T1, T2) is used as weight for times series of CARs.

The cross sectional average of SCARs is as under:

$$ASCAR_t = \frac{1}{N}\sum_{i=1}^{N} SCAR_{it} = \frac{1}{N} \sum_{i=1}^{N} \frac{CAR_{it}}{s_i} \quad (15)$$

To test significance of ASCARs, Zs-statistic is calculated which follows a standard normal distribution. It tests the null hypothesis that on an event day ASCAR is equal to zero. The cross-sectional Zs-values are calculated as under:

$$Z_s = \sqrt{N}\,(ASCAR_t) = \frac{1}{\sqrt{N}} \left(\sum_{i=1}^{N} SCAR_{it}\right) \quad (16)$$

Results of the Study

Ex-split day is the day on which shares in the stock market trade at new face value. This study also analyses impact of stock splits on abnormal returns around ex-split day.

1. Impact on AARs- ex-split day

To find impact on ARs first AARs are calculated for each day in the event window using equation (6).**Figure 1** plots AARs and shows that AAR is negative on ex-split day. The AARs are positive for two days after ex-split day. After t_{+2} day AARs are negative and this descent is continual throughout the event window.

[11] The assumption that all CARs are identically distributed is very strong. The assumptions that variance of all CARs is equal for all series is not likely to be true. Some shares may be more volatile than others lowering power of significance test. Therefore, weighted average of cumulative abnormal returns that is ASCARs can be taken which puts lower weight on CARs with high variance. Standardization corrects eventual correlations between abnormal returns over the event window.

Figure 1: AARs (ex-split day)

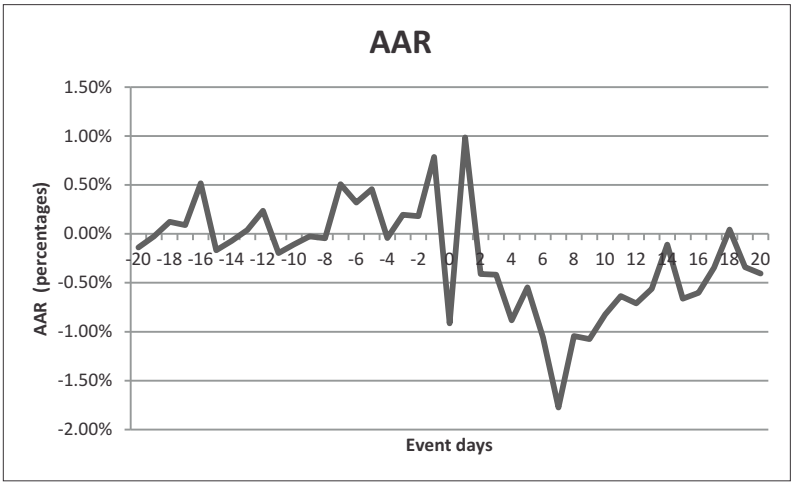

Table 1.1reports that AAR on ex-split day is -0.91 % and it is 0.79% on t_{-1}day. So,on ex-split day there is a decrease in ARs by about 1.7.On t_{+1} day AAR is 0.99%.Thus, there is an increase in AAR by 1.9 after ex-split day. The *Z*-statistic is calculated to test the null hypothesis that AARs on an event day is zero. The AARs are positive and have significant Z-values at 5% level of significance on days - t_{-7},t_{-5}, t_{-1} and t_{+1}.The AARs are negative with significant *Z*-values at 5% level of significance on days -t_{+4}, t_{+6},t_{+7}, t_{+8}, t_{+9}, t_{+10}, t_{+11}, $t_{+12,}$$t_{+13,}$$t_{+15}$ and t_{+16}.

Proportion test is done to test the null hypothesis that proportion of positive ARs is equal to proportion of negative ARs, which should be equal to 50%.**Table 1.1** shows that null hypothesis is rejected and significant number of negative ARs are present on 16 days - t_{-11} and all days starting from t_{+2} to t_{+19}. The null hypothesis is rejected and a significant number of positive ARs are present on t_0 and t_{+1} day.

Table 1.1: AARs and *Z*-values (ex-split day)

Event day	AARs (%)	Standard deviation (%)	*Z*-values*	Number of positive ARs	Number of negative ARs	*p*-values for Test of Proportion*
-20	-0.14%	3.22%	-0.63	93	121	.065
-19	-0.03%	3.53%	-0.11	101	113	.452
-18	0.12%	3.14%	0.58	101	113	.452
-17	0.09%	3.71%	0.35	107	107	1.00
-16	0.52%	3.94%	1.92	115	99	.305
-15	-0.17%	3.33%	-0.74	102	112	.539
-14	-0.07%	3.35%	-0.31	97	117	.194
-13	0.04%	3.54%	0.17	108	106	.946
-12	0.24%	3.29%	1.05	108	106	.946
-11	-0.20%	3.48%	-0.82	87	127	**.008**
-10	-0.11%	3.62%	-0.44	103	111	.632
-9	-0.03%	3.70%	-0.10	103	111	.632
-8	-0.04%	3.51%	-0.18	102	112	.539
-7	0.51%	3.57%	**2.07**	113	101	.452
-6	0.32%	3.27%	1.43	116	98	.245
-5	0.46%	3.24%	**2.07**	116	98	.245
-4	-0.04%	3.85%	-0.16	108	106	.946
-3	0.19%	3.49%	0.81	105	109	.838
-2	0.18%	3.68%	0.72	107	107	1.00
-1	0.79%	3.60%	**3.19**	116	98	.245
0	-0.91%	15.11%	-0.88	139	75	**.000**
+1	0.99%	4.79%	**3.01**	126	88	**.011**
+2	-0.41%	4.43%	-1.36	89	125	**.017**
+3	-0.42%	3.99%	-1.54	87	127	**.008**
+4	-0.88%	4.56%	**-2.83**	74	140	**.000**
+5	-0.55%	4.49%	-1.78	97	117	.194
+6	-1.06%	4.24%	**-3.65**	78	136	**.000**
+7	-1.78%	4.10%	**-6.34**	61	153	**.000**
+8	-1.04%	4.18%	**-3.66**	87	127	**.008**
+9	-1.08%	4.39%	**-3.59**	75	139	**.000**
+10	-0.82%	3.44%	**-3.50**	78	136	**.000**
+11	-0.64%	3.60%	**-2.58**	85	129	**.003**
+12	-0.71%	3.71%	**-2.80**	87	127	**.008**
+13	-0.56%	3.65%	**-2.25**	88	126	**.011**

Event day	AARs (%)	Standard deviation (%)	*Z*-values*	Number of positive ARs	Number of negative ARs	*p*-values for Test of Proportion*
+14	-0.11%	3.72%	-0.43	92	122	**.047**
+15	-0.66%	3.71%	**-2.61**	91	123	**.034**
+16	-0.60%	3.86%	**-2.29**	80	134	**.000**
+17	-0.35%	4.12%	-1.23	87	127	**.008**
+18	0.04%	4.05%	0.16	100	114	.374
+19	-0.34%	4.29%	-1.17	87	127	**.008**
+20	-0.41%	3.62%	-1.64	90	124	**.024**
*Values in bold are significant at 5% level of significance.						

Table 1.2: AARs and Z_s values (ex-split day)

Event day	AAR (%)	Z_s -value*
-20	-0.14%	-0.70
-19	-0.03%	0.71
-18	0.12%	0.04
-17	0.09%	1.33
-16	0.52%	0.12
-15	-0.17%	**-2.52**
-14	-0.07%	-0.48
-13	0.04%	-1.41
-12	0.24%	0.02
-11	-0.20%	-1.50
-10	-0.11%	-0.02
-9	-0.03%	0.03
-8	-0.04%	-0.80
-7	0.51%	1.62
-6	0.32%	1.01
-5	0.46%	1.03
-4	-0.04%	-0.20
-3	0.19%	0.87
-2	0.18%	0.13
-1	0.79%	**1.97**
0	-0.91%	**-12.66**
+1	0.99%	**4.00**
+2	-0.41%	**-2.62**
+3	-0.42%	**-3.11**
+4	-0.88%	**-4.94**
+5	-0.55%	**-2.73**
+6	-1.06%	**-7.06**
+7	-1.78%	**-8.56**

+8	-1.04%	**-5.00**
+9	-1.08%	**-4.59**
+10	-0.82%	**-4.09**
+11	-0.64%	**-3.32**
+12	-0.71%	**-2.47**
+13	-0.56%	**-3.04**
+14	-0.11%	-1.20
+15	-0.66%	**-1.97**
+16	-0.60%	**-2.89**
+17	-0.35%	**-2.00**
+18	0.04%	-0.68
+19	-0.34%	-1.04
+20	-0.41%	-1.96
* Values in bold are significant at 5% level of significance.		

The presence of positive AARs with significant Z_s-values on t_{-1} day in pre-ex-split day window implies that informed traders anticipating a price increase on ex-split day buy shares before the ex-split day to make fast profits. In post-ex-split day window, positive AARs with significant Z_s-values are present on t_{+1} day probably because of lower share prices after ex-split day.The AARs are negative with significant Z_s-values in post event window till t_{+17}.It implies that in Indian stock market there is the presence of significant negative wealth effect in post ex-split day window not in line with findings of Angel (1997) and Schultz (2000)[12].The results are in line with results reported by Lakonishok and Vermalen (1986), Rankine and Stice (1997) and Grinblatt et al.(1984).

The ACARs are computed using equations (11) and (12) to analyze the cumulative effect of stock splits on ARs of individual companies, on and around the ex-split day. **Figure 2** shows values of ACAR when plotted on a graph. It can be observed in the graph that ACAR values are negative throughout the event window starting from t_{-19} day.

[12] Angel (1997) and Schultz (2000) were of view that after stock splits there is reduction in bid-ask spread resulting in active participation and promotion of stock by market makers resulting in positive stock market effect. They also suggested that investors probably re-look at fundamentals of companies which drive share prices near to their intrinsic value.

Figure 2: ACARs (ex-split day)

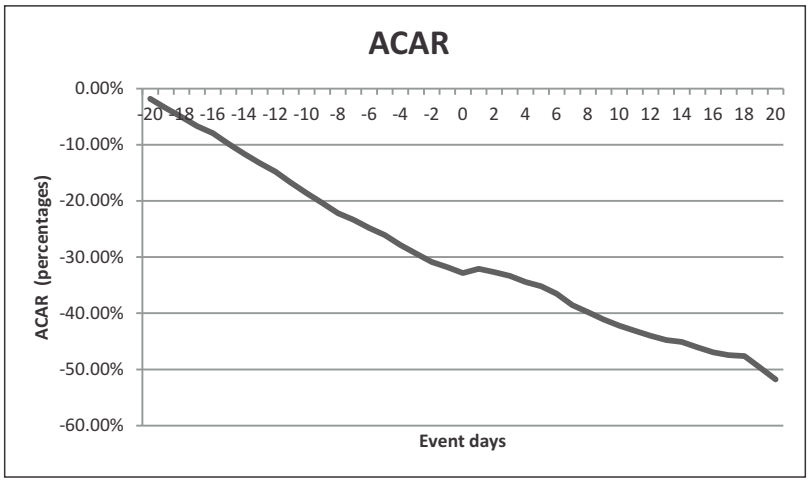

Table 1.3 shows that ACARs are negative and continuously decreasing throughout the event window. The statistical significance of ACARs is tested using *Z*-statistic given in equation (13).The ACAR do not have significant *Z*-value in the event window.

The SCARs and ASCARs are computed using equation (14) and equation (15) for ex-split event window. The significance of ASCARs is tested using Z_s- test in equation (16) at 5% level of significance. The null hypothesis tested is that ASCAR on an event day is zero. In **Table 1.3** it is reported that null hypothesis is rejected and SCARs have statistically significant Z_s-values on all 40 days starting from t_{-19} and till t_{+20} day.

Table 1.3: ACARs and *Z*- values (ex-split day)

Event day	ACAR (%)	*Z*-values*	Standard deviation (%)	Z_s- values*
-20	-1.83%	-1.03	25.96%	-1.61
-19	-3.50%	-0.99	51.82%	**-2.99**
-18	-5.05%	-0.95	77.63%	**-4.38**
-17	-6.70%	-0.95	103.45%	**-5.51**
-16	-7.93%	-0.90	129.24%	**-6.89**
-15	-9.84%	-0.93	154.97%	**-9.17**
-14	-11.60%	-0.94	180.79%	**-10.81**
-13	-13.28%	-0.94	206.57%	**-12.72**
-12	-14.80%	-0.93	232.41%	**-14.17**
-11	-16.76%	-0.95	258.17%	**-16.06**
-10	-18.60%	-0.96	283.97%	**-17.55**
-9	-20.40%	-0.96	309.76%	**-18.90**
-8	-22.17%	-0.97	335.57%	**-20.66**
-7	-23.37%	-0.95	361.41%	**-21.84**
-6	-24.81%	-0.94	387.21%	**-23.16**
-5	-26.08%	-0.92	413.00%	**-24.26**
-4	-27.85%	-0.93	438.81%	**-25.72**
-3	-29.36%	-0.92	464.60%	**-26.92**
-2	-30.87%	-0.92	490.41%	**-28.40**
-1	-31.81%	-0.90	516.23%	**-29.37**
0	-32.86%	-0.92	519.90%	**-33.11**
+1	-32.08%	-0.90	523.48%	**-32.21**
+2	-32.69%	-0.91	526.99%	**-33.28**
+3	-33.34%	-0.92	530.48%	**-34.36**
+4	-34.44%	-0.94	533.93%	**-36.29**
+5	-35.18%	-0.96	537.40%	**-37.01**
+6	-36.53%	-0.99	540.85%	**-39.30**
+7	-38.54%	-1.04	544.27%	**-42.21**
+8	-39.84%	-1.06	547.65%	**-43.96**
+9	-41.12%	-1.09	551.05%	**-45.56**
+10	-42.20%	-1.11	554.47%	**-47.02**
+11	-43.13%	-1.13	557.90%	**-48.13**
+12	-44.02%	-1.15	561.36%	**-49.04**
+13	-44.78%	-1.16	564.79%	**-50.05**
+14	-45.13%	-1.16	568.24%	**-50.64**
+15	-46.08%	-1.18	571.62%	**-51.43**
+16	-46.94%	-1.19	575.01%	**-52.28**
+17	-47.47%	-1.20	578.47%	**-52.73**
+18	-47.64%	-1.20	581.97%	**-52.67**
+19	-49.67%	-1.20	607.68%	**-54.23**
+20	-51.79%	-1.20	633.44%	**-56.14**

***** Values in bold are significant at 5% level of significance.

The presence of positive AARs with significant Z_s-values on t_{-1} day in pre-ex-split day window implies that informed traders anticipating a price increase on ex-split day buy shares prior to ex-split day to make fast profits. In post-ex-split day window, positive AARs with significant Z_s-values are present on t_{+1} day probably because of lower share prices after ex-split day.

The AARs are negative with significant Z_s-values in post event window till t_{+17}.It implies that in Indian stock market there is the presence of significant negative wealth effect in post ex-split day window not in line with findings of Angel (1997) and Schultz (2000)[13].The results are in line with results reported by Lakonishok and Vermalen (1986), Rankine and Stice (1997) and Grinblatt et al.(1984).

Impact on company-wise ARs –ex-split day using two tailed t-test

The two tailed *t*-test is done to provide more strength to results relating to ARs in ex-split window. The *t*-test compares ARs of pre- event window of each company with ARs of the post- event window. It tests the null hypothesis that there is no significant difference in ARs before and after ex-split day. The null hypothesis is rejected for 16% of the sample companies since the *p*-value is smaller than 0.05 for these companies. It implies that there is a chance of earning ARs only for 16% of the companies.

6. SUGGESTIONS AND IMPLICATIONS

There is the presence of significant ARs on and around ex-split day. This implies that there is a presence of significant impact of stock splits on share prices around ex-split day. On ex-split day there is negative AAR preceded and succeeded by positive AARs. The impact of stock splits is present for a short time duration around ex-split day as indicated by CARs also, calculated to check the robustness of AARs. The AAR on ex-split day is -1.55% and on t_{-1} day 0.79%. There is a decrease in AARs observed on the ex-split day. On t_{+1} day AAR is 0.96% indicating an increase in AAR. This implies that traders anticipating a price increase on ex-split day buy shares before the ex-split day to make fast profits.The ACARs analysis shows that

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[13] Angel (1997) and Schultz (2000) were of view that after stock splits there is reduction in bid-ask spread resulting in active participation and promotion of stock by market makers resulting in positive stock market effect.They also suggested that investors probably re-look at fundamentals of companies which drive share prices near to their intrinsic value.

cumulative ex-split effect is long lasting. Similar results were reported by Grinblatt et al.(1984); Lakonishok and Lev (1987); Mishra (2007); Gupta (2007); and Joshipura (2008)**.** The stock splits are regarded as positive news around ex-split day. Thus ARs show pronounced and visible ex-day effect of stock splits.

The present study suggests that investors, while planning their investment or trading portfolio, have to decide a time horizon for investment in the splitshares. This is recommended to ensure that the benefits of e ARs are taken since the share prices do not adjust fully in proportion to split ratio immediately on and after the ex-split day. It is suggested that this advantage must be availed quickly since impact of stock splits is found to present for short time duration.

Scope for further Research

This is an event study with respect to the corporate action of the stock splits. The methodology adopted handles huge historical database from Indian stock market. The extensive research thus conducted can be used as a benchmark methodology for event study in other types of corporate announcements like dividend announcements, mergers and acquisitions decisions etc. Thus there is immense scope for further research.

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