The Indian Equity Market Around The Ex-Split Date

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The market response to stock splits is investigated with the dataset from an emerging country – India for the period from 2006 to mid September 2008. The study reports significantly positive abnormal returns on the day of split execution and up to two days later. The regression analysis suggests that the positive reaction can be attributed to the trading range hypothesis and liquidity hypothesis. The post-split period experiences abnormally high negative returns which wipes out any positive gain during the split execution. This seems to be mostly explained by the pre-split price increase and size of firms suggesting that the firms which have experienced a high increase in price during the pre-split period and the firms which are smaller in size are the ones that suffer the worst returns.

Field of Research: FINANCE: Corporate Finance, Stock Markets

1. Introduction:

In theory, stock-splits are cosmetic corporate events as they simply increase the number of outstanding shares and decrease the price of each outstanding share. Hence, there should be no significant effect on the value of the firm. However, empirical evidence suggests that the market generally reacts favourably to stock splits[1]. The contradiction between theory, which expects no change in firm value consequent to stock splits, and the reality, with scores of evidence of significant market reaction, triggers the present study. The market response to stock splits is investigated with the dataset from an emerging country – India, which is distanced from the west in terms of geographical location, economic development, institutional and legal framework. Not much is available in the Indian context, so far, except for the commendable work by Mishra (2007), which documents negative effect on price and return of stocks following splits. The study also reports a positive effect on volatility and trading volume following the split events. The present paper tries to provide a few additional insights on the issue and therefore, differs from Mishra's (2007) study in the following ways. Firstly, an attempt is made to explain the significant Cumulative abnormal returns around the split execution dates with the help of regression analysis. Secondly, the independent variables cover issues like small firm hypothesis, price run up, deviation of price from market average, which are unexplored in his paper. Thirdly, the data set of the present study covers the period post Mishra's study, i.e., from January 2006 to mid-September 2008.

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The results of the present study shows significantly positive cumulative abnormal returns on and up to two days of split execution, following which there is a major decline in share prices which wipes out much more than the gain of the execution period. The signalling hypothesis does not seem to provide any explanation for the significant CAR around execution date, while the trading range hypothesis along with the liquidity hypothesis seem to contribute significantly towards the positive CAR occurring on and immediately after the execution. The small firm hypothesis also shows weak explanatory power for the change in wealth. The post execution negative reaction is mostly explained by run up of stock prices preceding the execution, implying that the stock split has induced a revision of stock's fundamentals, probably bringing prices to a more fundamental level.

The rest of the paper is organized as follows. Section 2 discusses the theoretical background and hypotheses to be tested. Section 3 describes the data and methodology. The results are presented in section 4 and the study winds up offering the main conclusion of the study in section 5.

2. Theoretical background:

Fama etal (1969) has been the pioneering study to examine the share price performance of splitting firms. Although the economic literature has not yet found a definitive explanation for either the abnormal returns observed around the announcement and execution dates, or the reasons why managers decide to split, different explanations, not necessarily mutually exclusive have been proposed. The more prominent hypotheses are the signalling hypothesis, the trading range hypothesis, the liquidity hypothesis and the neglected firm hypothesis.

The signalling hypothesis

The signalling hypothesis proposes that, in a scenario of asymmetric information between managers and investors, managers may use stock splits to signal positive information to the market about the firm's future expectations. The presence of positive abnormal returns around the stock split announcement that is found in many empirical studies, (Asquith etal, 1989; Ikenberry, etal, 1996; Mukherji etal, 1997) provides evidence for the signalling hypothesis.

Trading range hypothesis

According to the optimal trading range hypothesis, stock splits are used as tools to realign the share price to a desired price range so that it is more affordable for small investors to buy round lots of shares. If the pre-split share price is at a high level, then a stock split is justified for improving the marketability of the shares (Baker and Gallagher, 1980; Lakonishok and Lev, 1987; McNichols and Dravid, 1990).

The liquidity hypothesis

The management's motivation to bring the share price to an optimal trading range arises from the desire to improve liquidity. The evidence for the liquidity hypothesis is mixed. Muscarella and Vetsuypens (1996), Desai, Nimalendran and Venkataraman

(1998), Menendez and Gomez-Anson (2003) observe an increase in trading volume during the post-split period, and hence provide support for the liquidity hypothesis of stock splits. On the other side, Conroy, Harris and Benet (1990); Ferris, Hwang and Sarin (1995) present results which indicate that corporate liquidity decreases rather than increases after the split.

Small firm hypothesis

Small firm or neglected firm hypothesis suggests that since the smaller firms have fewer announcements published in the financial press, the split announcement is expected to create greater market interest than it would be in case of larger firms. So, small firms may have an incentive to adopt the stock splits to grab more attention. (Grinblatt etal, 1984).

3. Data and Methodology

3.1 **Data**

The basic sample is comprised of all Bombay Stock Exchange (BSE) equity stocks that have split between January 2006 and mid-September 2008 and is recorded in the CMIE database Prowess 3.1 version. There were a total of 230 stock splits during the period. The following criteria have been applied to include a company in the sample.

i) The stock price data is available for 270 days prior to the ex-split date.
ii) Data for 60 days are available for the post-split period.
iii) Other required financial information are available on the Prowess database.

After filtering on the basis of the above criteria, the number of firms on which the analysis could be carried out was 170.

3.2 Methodology to ascertain market reaction around stock splits.

In the present study, the event is the split execution date, defined as day 0. The estimation window is the 250 day period from -270 to -21 trading days. The post-split period examined in the study runs to 60 trading days after the split. In this study, the benchmark index chosen for running the regression for the market model is the BSE 100 index. This index represents around 67% of total market capitalization as on May, 2008. The Brown and Warner (1985) methodology is applied to test for the significance of abnormal returns.

3.3 Explanatory variables for the regression equation

The significant cumulative abnormal return around the stock splits would need further probing in order to explain the market reaction to stock splits. Based on the past literature, an attempt is made to determine which factors can explain the significant CAR.

The hypotheses to be tested are the following:

The signalling hypothesis: Ikenberry etal (1996) suggest the relation between price and book value as a measure of undervaluation. Low Price to book value firms are more likely to be undervalued. If a stock split is a signal of undervaluation, and if

price to book ratio is a good proxy for the degree of undervaluation, the magnitude of the split reaction should be negatively correlated with price to book ratio. (Ikenberry etal, 1996). This study uses the average price to book ratio of the 60 days prior to the split (PB), as a proxy for the undervaluation.[2]

The trading range hypothesis: To test this hypothesis, the study uses the ratio of the firm's share price at the close of the previous month[3] to the average share price of all companies on the same day (PMAR), traded at the Bombay stock exchange. The results may be either way. If positive, then firms with larger price deviation earns higher returns and if negative, firms with smaller price deviation from the market show better returns.

The liquidity hypothesis: The post to pre split trading volume ratio is expected to have a positive relation with execution period CAR. The 30 day post split trading volume over 30 day pre split trading volume (VOLUMER) is used as the proxy for liquidity measure in order to assess whether market reaction is explained by increase in liquidity.

The small firm hypothesis: Following Grinblatt etal (1984) Wulff (2002), the study uses the variable MCAP, which is the logarithm of the market value of the firm 10 days prior to the split, as Brown etal (1983) document that there exists an approximately log-linear relation between firm size and excess returns in their samples.

Other variables: In order to assess whether the stock price increase before the split has any effect on the market returns, a variable RUNUP (price increase from day -60 to -10) is included in the regression analysis, which is expected to have a negative sign because it measures the extent to which price has already reacted to positive possibilities of the firm and therefore, no further price reactions are expected for the splits (Grinblatt etal 1984).

The empirical results are best explained by the trading range hypothesis and liquidity hypothesis for the short-run, while RUNUP seems to explain the longer period returns.

4. Empirical Findings:

4.1 Market reaction to stock splits

Table 1 presents the average abnormal returns earned by target firms during the event window -20 to +60. The T-statistics along-side reveals that the AAR on day 0 is highly positive and is significantly different from zero at 1% level of significance. The AARs on days -11 and -7 are also significantly positive at 5% level. This possibly implies that informed traders anticipating a price increase on execution bought shares prior to the same to make fast profits on execution. However, no theory is available to explain why particularly, these two days show abnormally positive returns. In the post-event period, day 1 and day 2 also show significantly positive returns at 5%and 1% level respectively. But beginning on the third day after split up to sixty days, the AARs are negative on 51 days and are significantly so on 16 days. A look at table 2 which presents the Cumulative Abnormal Returns (CAR),

shows that the pre-event CAR from day -20 to -1 and -10 to -1 are not significant, while the on-event CAR from day 0 to day 1 and day 0 to day 2 are significant at 1% level. The post-event CAR from day +3 to 10 and 3 to 60 are significantly negative at 1% level. In fact, the negative effect in the post event period is so high that it wipes out the 3.8% gains on days 0, 1 and 2 after which it makes a negative return of 22.9% from day 3 to day 60. For the entire investigation period from -20 to +60, the CAR is -17%. These results point to the fact that the euphoria regarding stock splits is very short-lived.

Table 1: Average abnormal Returns around split execution along with their T-statistics

Day	Average Abnormal Return (AAR)	T-statistics	Day	Average Abnormal Return (AAR)	T-statistics
-20	-7E-05	-0.03035	21	-0.00328	-1.42787
-19	0.002038	0.888323	22	-0.00462	-2.0126*
-18	-0.00137	-0.59572	23	-0.00423	-1.84366
-17	-0.00131	-0.5727	24	-0.01013	-4.414**
-16	0.003591	1.564769	25	-0.0019	-0.82939
-15	-0.00098	-0.42511	26	-0.00355	-1.54844
-14	-0.00101	-0.43862	27	-0.00321	-1.4006
-13	-0.00159	-0.69088	28	-0.00081	-0.35436
-12	0.003074	1.339817	29	-0.00338	-1.47384
-11	0.00454	1.978424*	30	-5E-05	-0.02187
-10	0.002716	1.183824	31	-0.00865	-3.771**
-9	0.002729	1.189259	32	-0.00717	-3.126**
-8	-0.00141	-0.61392	33	-8.8E-06	-0.00385
-7	0.005402	2.354293*	34	0.002622	1.142884
-6	-0.00023	-0.09962	35	-0.00223	-0.97125
-5	-0.00047	-0.20434	36	-0.00389	-1.69472
-4	0.004204	1.831968	37	-0.00827	-3.603**
-3	0.003357	1.463098	38	-0.00573	-2.4982*
-2	8.18E-05	0.035659	39	-0.00326	-1.41929
-1	-0.0041	-1.78836	40	-0.00126	-0.5506
0	0.02828	12.32437**	41	-0.00307	-1.33707
1	0.004523	1.971323*	42	-0.00392	-1.70682
2	0.005986	2.608828**	43	-0.00632	-2.756**
3	-0.00316	-1.37707	44	0.000357	0.155582
4	-0.00105	-0.45765	45	0.002893	1.260936
5	-0.00328	-1.4289	46	-0.00507	-2.209*
6	-0.01516	-6.60462**	47	0.003563	1.552694
7	-0.02087	-9.09501**	48	0.000396	0.172732
8	-0.01281	-5.58473**	49	-0.00383	-1.67077
9	-0.01104	-4.80938**	50	-0.00964	-4.200**
10	-0.00356	-1.553	51	-0.00077	-0.33503
11	-0.00838	-3.65148**	52	-0.00347	-1.51316
12	-0.002	-0.87046	53	-0.00361	-1.5729
13	-0.00509	-2.22004*	54	-0.00312	-1.35768
14	-0.00623	-2.71704**	55	0.000915	0.398915
15	-0.00308	-1.34279	56	-0.00072	-0.3146
16	-0.00405	-1.76434	57	0.000927	0.404119

17	-0.00292	-1.27173	58	-0.00397	-1.7283
18	-0.00377	-1.64093	59	-0.00355	-1.54911
19	-0.00423	-1.84268	60	-0.00074	-0.32426
20	-0.00259	-1.1282			

If the T-statistics is larger in absolute value than 1.96 or 2.58, the relevant AARs are statistically non-zero at the 5% and 1% level of significance respectively. *, ** indicate significance at 5% and 1% level respectively.

Table 2: Cumulative Abnormal Return (CAR) for different intervals along with their T-statistics.

Interval	CAR	T-statistics
-20 to -1	.0192	1.87
-10 to -1	.0122	1.69
0 to 1	.0328	10.11**
0 to 2	.0387	9.76**
3 to 10	-.0813	-12.53**
3 to 60	-.2290	-13.11**

If the T-statistics is larger in absolute value than 1.96 or 2.58, the relevant AARs are statistically non-zero at the 5% and 1% level of significance respectively. *, ** indicate significance at 5% and 1% level respectively.

4.2 Cross-sectional regression analysis

A cross-sectional regression analysis is made to identify the factors that contribute towards the highly positive and negative CARs. The regression model can be represented as follows:

$$CAR = a + b_1PB + b_2PMAR + b_3VOLUMER + b_4MCAP + b_5RUNUP + \varepsilon$$

The results are presented in table 3. Three regression equations are run, first with the dependent variable as the on-event CAR of day 0, 1 and 2, as the AARs on all these three days are significantly positive. The post event period CAR begins from day +3 and two regressions are run for the post-event period with dependent variables as CAR +3 to 10 and +3 to 60. First, regression equations were run for the dependent variable CAR (0, 1, 2) with each independent variable separately and significant results were found for variables that relate to the liquidity hypothesis VOLUMER (T=2.104, p=.037) and the trading range hypothesis (PMAR) (T= -3.032, p=.003), as well as size of the firm MCAP (T= -2.1, p=.037). With multivariate

regression equation for CAR (0, 1, 2), the coefficients of the variables VOLUMER PMAR turn out to be significant with p-values of .006 and .013 respectively. The remaining variables do not present any significant result. This was expected as there was no new information on split execution and so the signalling hypothesis could not have had any impact at this point in time, if it all, signalling would have any effect, it was expected on the announcement. The variable MCAP, which was significant in the uni-variate equation is not significant in the multi-variate setting as there seems to be the presence of co linearity between PMAR and MCAP with highly significant correlation (r=.730, significant at 1% level). The small firm effect, though not significant in the multiple regression, cannot be completely ignored. The liquidity hypothesis suggests that with increasing volumes of trade, the market made positive returns. The negative price to market ratio implies that the smaller the company's share price relative to the market average, the higher the probability to observe a positive abnormal return. This can be explained by the fact that the smaller difference between the company's share and the market average share price, the lower the post-split share price relative to the market average. This in turn, allows small individual investors to participate in the market game, increasing the trading activity and hence generating abnormal returns.

The post-split CAR of +3 to 10 (short period) and +3 to 60 (longer period) have been used in two separate regression equations to understand which variables explain the drastic negative returns to the shareholders. In case of both the equations, RUNUP has been the most significant variable. This implies that those firms which had the most price increases prior to the split are the ones with the lowest returns. The high increases in prices before the split were therefore, not according to fundamentals and the splits have actually induced a revision of optimistic valuations of these firms. Probably, this revaluation has pushed the prices down. For the longer term period, the coefficient for MCAP has been significantly positive and this suggests that the smaller the firms, the smaller the returns. This implies that the smaller firms for which there was a spurt in demand on split pushing the prices higher was actually a market over-reaction and the correction process begins soon after the second day of the split.

Table 3: Regression results of split execution abnormal returns

Variables	CAR (0, 1, 2)	CAR (3 to10)	CAR (3 to 60)
Constant	.042 (1.138)	-.037 (-.793)	-.424 (-3.63)**
PB	.001 (.734)	-.002 (-1.66)	-.004 (-1.39)
PMAR	-.022 (-2.52)*	.019 (1.71)	-.037 (-1.35)
VOLUMER	.018 (2.795)**	.012 (1.51)	-.005 (-.256)
MCAP	-.001 (-.225)	-.009 (-1.08)	.043 (2.14)*
RUNUP	.008 (.613)	-.039 (-2.25)*	-.088 (-2.02)*
R^2	.103	.074	.066
Adjusted R^2	.076	.045	.037

Figure in parentheses are the T-statistics. If the T-statistics is larger in absolute value than 1.96 or 2.58, the relevant AARs are statistically non- zero at the 5% and 1% level of significance respectively. *, ** indicate significance at 5% and 1% level respectively.

5. Conclusion:

Lakonishok and Lev (1987) refers to the stock splits as just a finer slicing of a given cake, and therefore, should have no effect on the market behaviour around stock splits. Yet, empirical evidence in the US and some other markets concludes that splits tend to impact the share price beyond the theoretical expectation.

In line with the results of many other studies, significantly abnormal returns are found on the day of split execution and up to two days later. The regression analysis suggests that the positive reaction can be attributed to the trading range hypothesis and liquidity hypothesis. The results for the post-split period is characterised by abnormally high negative returns which wipes out any positive gain during the split execution. This seems to be mostly explained by the pre-split price RUNUP and MCAP suggesting that the firms which have experienced a pre-split high increase in price and the firms which are smaller in size are the ones which suffer the worst returns. The splits therefore, seem to have induced the investors to make a revaluation of the firms and this has brought down the general price level and the returns.

Notes:

1. See for example, Fama etal, 1969, Grinblatt etal, 1984, Mc Nichols and Dravid, 1990, Ikenberry etal, 1996, for the US and Elfakhani and Lung, 2003, for Canadian market, Wulff, 2002, for the German stock exchange,

2. In order to test for the robustness of the findings, regressions were also run by changing the inputs such as average PB was calculated from days -60 to -31, Similarly, other inputs, such as VOLUMER was calculated for various ranges of days as 60 days preceding and 60 days following, 10 days preceding and following, 3 days preceding and following, MCAP was calculated for an average of 15 days before the split, RUNUP was calculated for 250 days prior to the split. The results were qualitatively the same.

3. If the split date fell within the first 10 calendar days, the previous to previous month closing price was considered so as to avoid the period immediately preceding the split, as the price may be influenced by the imminent split execution. However, this decision is arbitrary.

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