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Indian stock split announcements, 2001-2010 an empirical note

E.Prasanna and M.Surya
M.A.M.B-School, Siruganur, Trichy-621 105.

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ABSTRACT
This article analyses the market reaction to stock splits announcements, using a unique Indian sample over the period 2001 to 2010. Our event study finds a significantly positive Cumulative Average Abnormal Return (CAAR) around the announcement date. Liquidity increases lead to higher stock price changes, which supports the liquidity improvement hypothesis. Further, firm size and abnormal returns are inversely related, which is in line with the attention hypothesis.

Introduction

How does a stock split announcement affect a firm's stock price? What is a likely cause for the observed price reaction? Our article fits in the growing string of academic research that tries to answer these questions. With a stock split, old shares are split into a number of new shares with reduced par value, while leaving total firm market capitalization unchanged. Therefore, stock splits have no direct effect on firm values. Stock splits may be seen as mere accounting changes which do not necessarily affect firms' cash flows or values (Dennis and Strickland, 2003). Such purely aesthetic events, which do not relate directly to changes in the operating or financial structure of the firm, should not lead to share price changes.

Interestingly, market evidence appears to counter the above line of reasoning. Empirical stock split studies generally find positive abnormal returns on announcement day and on the days immediately surrounding (e.g., Fama *et al.,* 1969; Grinblatt *et al,*. 1984; Ikenberry *et al.,* 1996; Lamoureux and Poon, 1987; Desai and Jain, 1997). Literature offers three common hypotheses to resolve this apparent contradiction and to explain why firms engage in stock splits.

First, the liquidity-improvement hypothesis states that realigning the share price may draw more attention to a stock and thereby increase the demand, causing a positive price effect, see e.g. Grinblatt *et al.* (1984) and Lakonishok and Lev (1987). In short, a lower stock price attracts more attention from investors and generates greater trading volume, or turnover, thus enhancing liquidity. Muscarella and Vetsuypens (1996) and Schultz (2000) report considerable increases in trading volume subsequent to stock splits. However, Ohlson and Penman (1985), Lamoureux and Poon (1987) and Conroy *et al.* (1990) find no support for the liquidity-improvement hypothesis as they document that trading volume decreases after a split. Evidently, empirical results are still mixed.

Secondly, the signalling hypothesis is based on the notion that managers know more about the value of their firm than investors and use stock splits to convey favourable information about firms' future earnings. This hypothesis is developed from Fama *et al.* (1969), who suggest that companies can reduce information asymmetries that might exist between stockholders and management by announcing splits[1].

Thirdly, the attention or neglected firm hypothesis states that if little is known about a firm, its shares will trade at a discount. Arbel and Swanson (1993) report that market reactions to split announcements are stronger for information-poor stocks than for information-rich stocks. Ikenberry *et al.* (1996) support this finding and report the presence of an inverse relation between firm size and abnormal returns. In addition, brokerage fees paid by investors usually increase after stock splits. Therefore, brokers have more incentive to carry out research and promote the firm, which boosts the price (Angel, 1997).

In this article we employ event study methodology to analyse a unique data sample of 120 Indian stock split announcements over the period 2001 to 2010. This period has not yet been analysed in the stock split literature. Moreover, most studies focus on long-run post stock-split performance, and do not remove potentially confounding effects from the data as their objective differs from ours. Hence, to the best of our knowledge, no article has yet conducted an event study with such a large and recent data sample of stock splits from which all confounding effects have been removed. We fill this gap, and investigate whether the effects previously found still persist in current markets.

Our results are statistically significant and strongly suggest the existence of a positive relationship between split announcements and subsequent returns. This finding is relevant because it potentially poses a challenge to the efficient market hypothesis. Further, we employa cross-sectional regression to investigate potential factors that may help to explain these abnormal returns. Our results indicate that liquidity improvements lead to value increases, supporting the liquidity improvement hypothesis. We also document an inverse relation

[1] For more evidence on the signalling hypothesis see e.g. Arbel and Swanson (1993), Asquith (1989), Ikenberry *et al.* (1996) and McNichols and Dravid (1990).

Tele:
E-mail addresses: s1506p@gmail.com

between abnormal returns and firm size, which supports the neglected firm hypothesis. Our outcomes may help investors, advisors and policy makers better understand capital markets in general and the corporate stock split phenomenon more specifically.

Data and Methodology

The data consist of 913 stock splits that were announced on the Bombay Stock Exchange between 2001 and 2010. We remove 793 of the 913 splits because a Factiva analysis shows the presence of confounding effects which may seriously distort the event study outcome. More precisely, we exclude those splits for which another major corporate event for the same stock falls within the event window, which is set to 10 days around the announcement date, i.e. earnings announcements, dividend announcements, stock repurchases, mergers or acquisitions, changes of board, and rights issues. The final sample consists of 120 splits. Announcement dates, company names and split factors are obtained from Yahoo.Finance and verified using Thomson Reuters. Trading volume, turnover, firm size and earnings per share are obtained from DataStream. We apply standard event study methodology with a single factor market model (McWilliams and Siegel, 1997) [2].

Table 1 presents the distribution of the split ratio, defined as the number of new shares after the split per original share (McNichols and Dravid, 1990). The most popular split ratio is two for one. Three for two is the second most popular ratio. Only a small number of three for one and four for three splits are observed.

<< REFER TABLE 1 AROUND HERE >>

Empirical Results

Table 2 presents empirical results. Average Abnormal Returns (AAR) for days -1, 0, +1, +2 and +3 are all positive. The AAR equals 0.33% on announcement dates, which is statistically significant at the 5% level for the Patell-test, but not significant for the Rank-test. The AAR equals 0.71% on day +1, which is statistically significant for both tests. AARs for the other days are not statistically significant.

Fig. 1 presents a graphical view of CAARs. Prices run up from 2 days before until 3 days after announcement. However, from day four onwards, CAARs start to decline. Results suggest a strongly positive but short-lived market reaction to stock splits.

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Next, Table 3 shows that all event windows have positive and statistically significant CAARs. Event window (-1, +5) yields the highest CAAR equal to 1.94%.

<< REFER TABLE 3 AROUND HERE >>

Finally, McWilliams and Siegel (1997) indicate that test statistics from event studies may be sensitive to the presence of outliers. Hence, as a robustness test we remove the three highest and three lowest CAARs, and we re-run the test. Resulting CAARs remain positive and significant for same event windows as reported in Table 2, suggesting our previous results are robust.

Next, we investigate factors that may help to explain CAARs around split announcements. The following regression model is employed:

$$CAAR = a + p1\ (Firm\ size) + \quad (AEPS) + p_3\ (Split\ factor) + p4\ (AUQ) + e \qquad (1)$$

In equation 1, *CAAR* is measured over event window (-1, +1). *Firm size* is measured by the natural logarithm of the equity market value. Changes in earnings per share *(AEPS)* are calculated as the pre-announcement minus the post-announcement quarterly average EPS. Asquith *et al.* (1989) use this independent variable and find that splitting firms tend to experience large improvements in earnings prior to splits. McNichols and Dravid (1990), however, use *split factor* (split ratio) and find that the size of the split signals managers' confidence about future cash flows and earnings.

The change in liquidity *(ALIQ)* is measured by both the change in the logarithms of average trading volume *(ALOGVOL)*, and the change in volume turnover *(ATURN)*. Change in trading volume is calculated by subtracting the average 5 days pre-split volume from the average 5 days post-split volume. Volume turnover is defined as daily volume divided by shares outstanding.

Table 4 presents cross-sectional regression results in which equation 1 is modified to estimate five separate regression models (Model 1 to 5), each with one independent variable. Thus, in Model 1 the variable *Firm Size* is regressed on *CAAR*. The estimate is statistically significant at the 10% level, suggesting that lower market values lead to higher CAARs. Thisresult supports the neglected firm hypothesis in which small firms experience greater benefits from split announcements.

Next, Models 2 and 3 both examine the signalling hypothesis. Model 2 results suggest the presence of a positive relationship between CAAR and changes in EPS, albeit statistically insignificant. Model 3 results suggest the existence of a positive, but not statistically significant, relationship between CAARs and split factor. Further, Model 4 estimates show a positive and statistically significant relation between CAARs and change in trading volumes. When using the change in volume turnover as the independent variable (Model 5), we find similar results as in Model 4, albeit statistically significant at the 10% level only[3]. Results from Models 4 and 5 together suggest confirmation of the liquidity improvement hypothesis.

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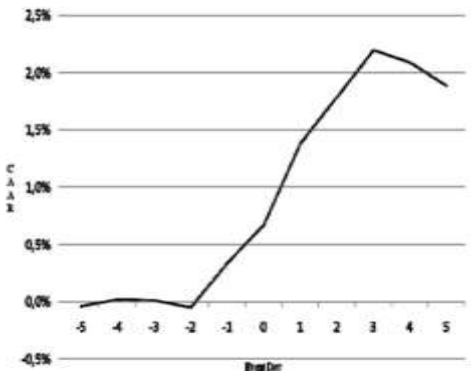
Fig. 1: Cumulative Abnormal Returns



[2] The estimation period for the market model runs from t-300 to t-46, being 255 days in length.

[3] As a robustness test, we increased the pre-split and post-split periods over which trading volumes change from five days to three, six and twelve months. We find statistically significant evidence of a liquidity effect using the three months period, but not for longer periods. We conclude that the liquidity effect is fairly short-lived.

Conclusion

We use event study methodology to analyse a unique data sample of 120 Indian stock split announcements that occurred between 2001 and 2010. We find statistically significant results that show the existence of positive abnormal returns around stock split announcements days. Evidently, in spite of the fact that capital markets have increasingly become deeper, more liquid and more efficient, these announcement effects still persist.

Using cross-sectional regressions, we analyse potential explanations for the presence of abnormal returns. Firstly, we find support for the signalling hypothesis: smaller firms tend to enjoy more benefits from stock splits. Secondly, we find no evidence to support the signalling hypothesis, using either the change in EPS or the split factor as independent variables. Thirdly, we document support for the liquidity improvement hypothesis, as changes in liquidity tend to be positively related to abnormal returns. It is still uncertain which hypothesis is most plausible. In future research we plan to use other explanatory variables and a more explicit behavioural model to further deepen our understanding of the observed price reactions.

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Table 1. The distribution of split ratios

Year	Number of Stock splits	Split ratio			
		2:1	3:1	3:2	4:3
2001	5	3	0	2	0
2002	17	9	0	7	1
2003	9	4	2	3	0
2004	14	7	1	6	0
2005	22	16	0	5	1
2006	13	9	0	4	0
2007	12	11	0	1	0
2008	4	4	0	0	0
2009	14	11	0	3	0
2010	10	6	0	4	0
Total	120	80	3	35	2

Table 2. Average abnormal returns

Day	AAR	Patell-test	Rank-test	Running CAAR
-5	-0.04%	0.201	-0.16	-0.04%
-4	0.06%	-0.32	0.20	0.02%
-3	-0.01%	-0.24	-0.35	0.01%
-2	-0.06%	0.19	0.30	-0.05%
-1	0.38%	1.23	1.11	0.34%
0	0.33%	2.05**	1.50	0.67%
+1	0.71%	3.11***	2.95***	1.38%
+2	0.40%	1.47	1.38	1.79%
+3	0.41%	1.40	-0.09	2.20%
+4	-0.11%	0.41	0.96	2.09%
+5	-0.20%	-1.17	-0.79	1.89%

Notes: Daily AARs and running CAARs aggregated from 5 days prior to announcement date.

*, **and *** denote statistical significance at the10, 5 and 1% level, respectively using a 2-tail test.

Table 3.Cumulative average abnormal returns

Day	AAR	Patell-test	Rank-test
(-5,+5)	1.89%	2.46**	2.11**
(-5,+2)	1.79%	2.68***	2.45**
(-2,0)	0.66%	2.00*	1.68*
(-1,0)	0.72%	2.30*	1.84*
(-1,+1)	1.43%	3.67***	3.21***
(-1,+5)	1.94%	3.16***	2.65***
(0,+1)	1.05%	3.65***	3.15***
(0,+4)	1.75%	3.73***	3.00***
(0,+5)	1.55%	2.93***	2.41***
(+1,+3)	1.52%	3.44***	2.45**
(+1,+4)	1.41%	3.71***	2.60***
(+1,+5)	1.22%	2.32***	1.98**

Notes: CAARs for different event windows around announcements.

*, **and *** denote statistical significance at the10, 5 and 1% level, respectively using a 2-tail test.

Table 4.Regression Analysis

Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Alpha	0.109	0.013	0.004	0.010	0.012
Firm size	-0.006 (-1.88)*				
Delta EPS		0.013 (0.66)			
Split factor			0.006 (0.38)		
Delta LOGVOL				0.019 (3.06)***	
Delta TURN					0.001 (1.92)*
Adjusted R*	0.03	0.00	0.00	0.07	0.03
p-value F-statistic	0.07*	0.51	0.70	0.00***	0.06*

Notes: Regression results of CAAR (-1, +1) on various variables with t-statistics in parentheses.

*, **and *** denote statistical significance at the10, 5 and 1% level, respectively.