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Impact of stock splits on liquidity around the Announcement and Ex-split day

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Abstract:
A stock split is a decision by company's board of directors to increase number of outstanding shares of the company without changing shareholders equity but by changing face value of equity shares. The results shows that average illiquidity ratio with significant p-values are present for event window of longer duration. It implies that there is a significant change in liquidity for event windows of longer durations. The results show that impact of splits on liquidity around announcement day is same that is positive no matter what is the measure of liquidity. The result that there is no significant change in illiquidity ratio implies that liquidity changes significantly around ex-split day. This ratio gives absolute (percentage) price change per rupee of daily trading volume or daily price impact of order flow.

1. Introduction

Liquidity is the ability to convert shares into cash and vice versa without affecting share prices or with minimal impact on share prices, at low cost and at short notice. Researchers are interested in understanding effect of different corporate announcements on liquidity. Selling an illiquid share quickly can be difficult or even impossible without accepting lower price. In the present study we analyse the impact of the corporate announcement stock splits.

2. Literature Review

The research studies in past have studied the different aspects of liquidity after a corporate announcement like stock splits in order to find an explanation to the reasons to for undertaking a stock split. The first such explanation was proposed by Copeland (1979) and states that there is a price range in which trading of shares of a company is most favourable for that company. There is maximum liquidity in this range. If share prices are higher than this price range, managers decide to split shares to bring down share prices. Thus, stock splits is done in order to maintain share prices in a favourable trading range and improve liquidity by facilitating trading of shares.

According to Conroy, Harris, and Bennet (1999) when shares become quite costly, stock splits is undertaken to move share prices to a suitable price range. The optimal trading range is considered as a compromise between desires of wealthy investors and institutions who desire a high price (to minimize brokerage costs) and desires of small investors who desire a low-price.

Liquidity hypothesis is a variation of optimal trading range hypothesis. It is based on assumption that corporate liquidity is affected by share prices (Maloney and Mulherin, 1992; Muscarella and Vetsuypens, 1996).If share price is too high. Then liquidity may decline. A low share price attracts more individual investors (especially small investors). enhances trading liquidity and reduces trading costs. There are mixed reactions in support of this hypothesis. Lakonishok and Lev (1987) and Baker and Powell (1993) supports this hypothesis.

Baker and Gallagher (1980). Grimblatt et al. (1984). Amihud and Mendelson (1986). Baker and Philip, (1994). Muscarella and Vetsuypens (1996) using American Depositary Receipts and Wulff (2002)

were of opinion that managers announce splits to increase liquidity. Lamoureux and Poon (1987). Maloney and Mulherin (1992) and Angel et al. (1997) suggested that number of shareholders, volume, number of transactions increases after stock splits while value of shares traded decreases after ex-split day. Murry (1985). Lamoureux and Poon (1987). Brennan & Copeland (1988). Conroy et al. (1990) and Desai et al. (1998) observed decrease in liquidity. Easley O'Hara and Saar (2001) and Goyenko et al. (2005) not at all supported liquidity aspect of stock splits.

Like foreign markets mixed responses in relation to liquidity were reported in India also. Mishra (2006). Gupta and Gupta (2007). Ray (2011). Datta and Banerjee (2012) and Thirumalai (2014) reported increase in liquidity after ex-split day of stock splits. Joshipura (2008) and Chakraborty (2012) found significant improvement in liquidity both around announcement and ex-split day. Singh and Choudhary (2010). Banerjee and Banerjee (2012) and, Suresha and Naidu (2013) found an increase in liquidity around announcement day.

3. Objectives of the study

The current study aims at examining the impact of splits on liquidity. In the light of above discussion, the research objective framed is:

- To examine the effect of stock splits on liquidity.
- To investigate differences in effect of stock splits on liquidity around announcement and ex-split day.

4. Research issues

To achieve the objectives enumerated, following research issues are identified:

1. What is the effect of stock splits on liquidity?
2. Is there a difference in effect of stock splits on liquidity with difference in day?

5. Research hypotheses

Research hypotheses are developed:

HYP: 1- Stock splits have impact on liquidity.

6. Research methodology

To test the hypothesis enumerated following research methodology has been designed.

6.1 Data and sampling period

The list of sample 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 2013.The fourteen-year period is chosen to ensure reasonable size of the sample. Non–availability of share prices data and other related limitations restricted the size of sample to 214 companies.

6.2 Sources of data

For secondary data collection Prowess 19.1, a CMIE database was accessed for- daily closing share prices data, and data for liquidity measures, for sample companies around announcement and ex-split day**.**

6.3 Research Measures

In the current study to find impact on Liquidity of shares we use the measure of illiquidity ratio.

Amihud and Mendelson (1986) described positive relation between equity value and liquidity. They introduced illiquidity model according to which rational investors discount illiquid shares heavier than liquid shares due to higher transaction cost and trading frictions. By announcing stock splits shares are placed in best trading range which attracts maximum investors and increases liquidity.

In present study definition of liquidity given by Amihud et al. (2005) is adopted to define the term

liquidity.

In the current study measures of liquidity taken in order to test research hypotheses relating to impact of stock splits on liquidity is illiquidity ratio.

Liquidity is defined as ability of continuously transforming asset from one form to other (Ivanovic, 1997). Liquidity is the ease of trading a security (Amihud, Mendelson, and Pedersen, 2005) that makes it one of the key elements upon which the investor will decide whether or not to invest. Selling an illiquid share quickly can be difficult or even impossible without accepting lower price. In present study definition of liquidity given by Amihud et al. (2005) is adopted to define the term liquidity.

Illiquidity Ratio is another parameter of liquidity taken in the current study. According to Amihud and Mendelson (1986) there is a positive relation in equity value and liquidity. According to them the rational investors discount the illiquid securities heavier than the liquid securities due to higher transaction cost and greater trading frictions. The illiquidity[1] measure proposed by Amihud (2002) is calculated as under:

$$ILL_t = {}^{1}/_{d_t}\left(\sum_{t=1}^{di} \frac{|R_{id}|}{VOLD_{id}}\right) \quad (7.1)$$

Where d_i is the number of days for which data is available i.e. when trading volume is not zero.$|R_{id}|$ is absolute return on day d for company i and $VOLD_{id}$ is trading volume in rupees on day d for company i.

The ratio measures how daily share price reacts to a rupee of trading volume and closely relate to Kyle's [2](1985) concept of illiquidity. A larger trading volume in theory leads to smaller price change. A more liquid market should have smaller illiquidity ratio[3].Thus a decreasing illiquid ratio implies that on these days there is an increase in liquidity. This ratio gives absolute (percentage) price change per rupee of daily trading volume, or the daily price impact of order flow.

7. Empirical results

The Illiquidity Ratio when taken as a proxy to liquidity it can be observed in **Table 2** that there is no significant p-value when day-wise paired t-test is conducted to test the null hypothesis that there is no difference in average illiquidity ratio of two consecutive days.

The two tailed t-test at 5% level of significance is conducted to test the null hypothesis that there is no significant difference in average illiquidity ratio before and after the announcement day for event window of different lengths. For event window of length t_{-20} to t_{+20} and for t_{-10} to t_{+10} null hypothesis is rejected at 5% level of significance as per **Table 1**.

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1 Amihud's illiquidity measure is average ratio of absolute return and dollar volume. This measure is supposed to capture impact of per dollar trade on stock return. Smaller the impact means lower illiquidity or higher liquidity. This is a reasonable measure of liquidity because of its significant positive correlation with microstructure based illiquidity measures like price impact and the fixed-cost component of bid-ask spread (Brennan & Subrahmanyam, 1996).

2 Kyle defines illiquidity as price impact of order flow

3 Another interpretation of ILLIQ is related to disagreement between traders about new information as given by Harris and Raviv (1993). When investors agree about implication of news, share price changes without trading while disagreement induces increase in trading volume. Thus, ILLIQ can also be interpreted as a measure of consensus belief among investors about new information.

Table 1: t-test Values - announcement day (average illiquidity ratio)

Event days	t-test values	t-critical	p-values*
-20 to +20	-4.32	2.06	**0.00**
-10 to +10	-1.89	2.16	**0.08**
-5 to +5	-0.06	2.31	0.96
-2 to +2	-1.63	12.71	0.35
*Values in bold are significant at 5% level of significance.			

Figure 1 shows average illiquidity ratio around announcement day of stock splits. It can be observed that average illiquidity ratio is increasing after t_{+15} day.

Figure 1: Average illiquidity ratio - announcement day

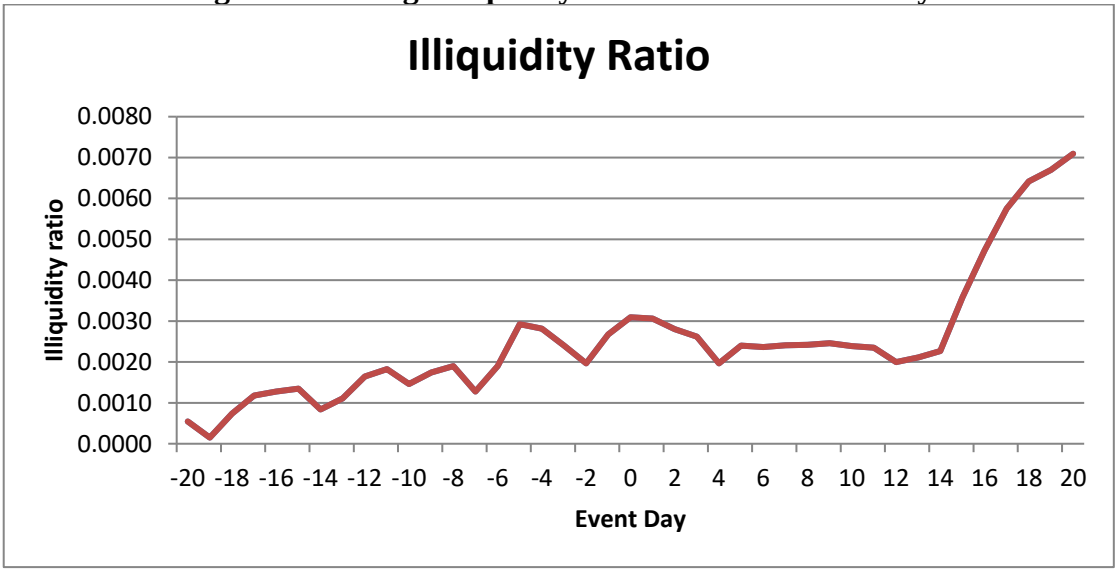


Table 2: Average illiquidity ratio and trade size - announcement day

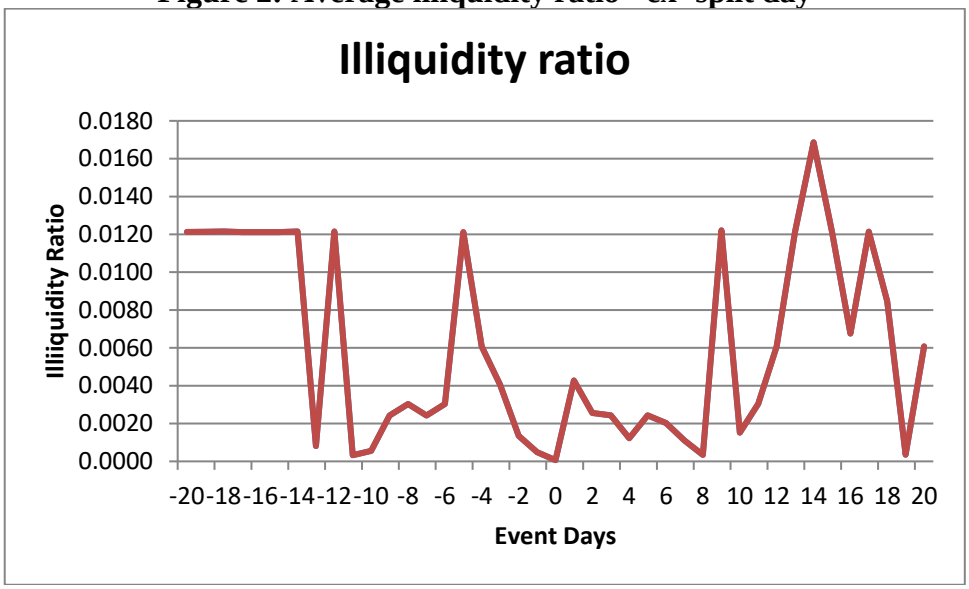
Event day	Average illiquidity Ratio	p-values for paired t-test*
-20	0.0005	
-19	0.0002	0.402
-18	0.0007	0.139
-17	0.0012	0.170
-16	0.0013	0.709
-15	0.0013	0.467
-14	0.0008	0.266
-13	0.0011	0.400
-12	0.0016	0.377
-11	0.0018	0.271
-10	0.0015	0.310
-9	0.0017	0.163
-8	0.0019	0.335
-7	0.0013	0.438
-6	0.0019	0.269
-5	0.0029	0.163
-4	0.0028	0.327
-3	0.0024	0.518
-2	0.0020	0.362
-1	0.0027	0.391
0	0.0031	0.320

Event day	Average illiquidity Ratio	p-values for paired t-test*
+1	0.0031	0.688
+2	0.0028	0.091
+3	0.0026	0.146
+4	0.0020	0.197
+5	0.0024	0.176
+6	0.0024	0.867
+7	0.0024	0.788
+8	0.0024	0.859
+9	0.0025	0.720
+10	0.0024	0.462
+11	0.0023	0.744
+12	0.0020	0.469
+13	0.0021	0.434
+14	0.0023	0.232
+15	0.0036	0.233
+16	0.0047	0.288
+17	0.0058	0.103
+18	0.0064	0.197
+19	0.0067	0.601
+20	0.0071	0.218
Values in bold are significant at 5% level of significance.		

8. Impact on average illiquidity ratio - ex-split day

The average illiquidity ratio is calculated for each day in the ex-split window. **Figure 2**illustrateschanges in average illiquidity ratio around ex-split day of stock splits. It can be noted that the average illiquidity ratio is highest on t_{+15} day.

Figure 2: Average illiquidity ratio - ex- split day



Illiquidity Ratio is calculated using equation (7.1). The average illiquidity ratio in **Table 4** does not change significantly on any day of the ex-split day window when day-wise paired t-test is conducted. The two tailed t-test is conducted to test the null hypothesis that there is no significant difference in average illiquidity ratio before and after ex-split day. In **Table 3** it can be observed that the null hypothesis is not rejected at 5% level of significance.

Table 3: t-test **Values - ex-split day (average illiquidity ratio)**

Event days	t-test values	t-critical	p-values*
-20 to +20	0.61	2.02	0.55
-10 to +10	0.35	2.10	0.73
-5 to +5	1.05	2.78	0.35
-2 to +2	-2.60	12.71	0.23
*Values in bold are significant at 5% level of significance.			

Table 4: Average illiquidity ratio and trade size - ex-split day

Event day	Average illiquidity ratio	p-values for paired t-test*
-20	0.0121	
-19	0.0121	0.516
-18	0.0122	0.260
-17	0.0121	0.292
-16	0.0121	0.211
-15	0.0121	0.181
-14	0.0121	0.310
-13	0.0008	0.318
-12	0.0121	0.318
-11	0.0003	0.318
-10	0.0006	0.319
-9	0.0024	0.318
-8	0.0030	0.319
-7	0.0024	0.318
-6	0.0030	0.316
-5	0.0121	0.319
-4	0.0061	0.318
-3	0.0040	0.319
-2	0.0014	0.319
-1	0.0005	0.317
0	0.0001	0.389
+1	0.0043	0.300
+2	0.0026	0.292
+3	0.0024	0.096
+4	0.0012	0.319
+5	0.0024	0.319
+6	0.0020	0.323
+7	0.0011	0.317
+8	0.0003	0.341
+9	0.0122	0.317
+10	0.0015	0.315
+11	0.0030	0.318
+12	0.0061	0.319
+13	0.0121	0.319
+14	0.0169	0.319
+15	0.0121	0.319
+16	0.0068	0.631
+17	0.0121	0.630

Event day	Average illiquidity ratio	p-values for paired t-test*
+18	0.0085	0.573
+19	0.0004	0.193
+20	0.0061	0.322
Values in bold are significant at 5% level of significance.		

9. Conclusion

There is a significant decrease in illiquidity ratio noted on ex-split day.From the above discussion it can be inferred that average illiquidity ratio with significant p-values are present for event window of longer duration. It implies that there is a significant change in liquidity for event windows of longer durations.

From the above results it can be inferred that impact of splits on liquidity around announcement day is same that is positive no matter what is the measure of liquidity. Also results of two-tailed t-test for each company imply that there is maximum chance of significant change in number of transactions after stock splits around announcement day.

The result that there is no significant change in illiquidity ratio implies that liquidity changes significantly around ex-split day. This ratio gives absolute (percentage) price change per rupee of daily trading volume or daily price impact of order flow.

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