

TESTING THE SEMI-STRONG FORM EFFICIENCY OF INDIAN STOCK MARKET WITH RESPECT TO INFORMATION CONTENT OF BONUS ANNOUNCEMENT

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ABSTRACT

The vast majority of efficient market research to date has focused on developed markets. Not much research has been done on the developing and less developed countries markets. Corporate events have numerous effects on the stock market, as found by several research studies in the world. In this regard, the aim of this paper is to test the semi-strong form of efficiency in the Indian equity market, following an event study approach. The events considered in this paper are bonus announcements for a period of 1/4/1996 to 31/3/2011. These events are tested for abnormal returns. The data selected is free from the impact of confounding events. -30 to +30 days are taken to test the abnormal returns. The results indicate that Indian stock market (nifty) is not perfectly efficient and there is significant abnormal return during the announcement period

Key words: *Bonus announcement, Expected Return, Average abnormal return, Cumulative average abnormal Return, Efficient Market Hypothesis, Announcement period and Announcement Day.*

1. INTRODUCTION:

When the term 'efficient market' was introduced into the economics literature thirty years ago, it was defined as a market which 'adjusts rapidly to new information' (Fama et al 1969). It soon became clear, however, that while rapid adjustment to new information is an important element of an efficient market, it is not the only one. A more modern definition is that asset prices in an efficient market 'fully reflect all available information' (Fama 1991). This implies that the market processes information rationally, in the sense that relevant information is not ignored, and systematic errors are not made. As a consequence, prices are always at levels consistent with 'fundamentals'. The words in this definition have been chosen carefully, but they nonetheless mask some of the subtleties inherent in defining an efficient asset market. For one thing, this is a strong version of the hypothesis that could only be literally true if 'all available information' was costless to obtain. If information was instead costly, there must be a financial incentive to obtain it. But there would not be any financial incentive if the information was already fully reflected in asset prices (Grossman and Stiglitz 1980). A weaker, but economically more realistic version of the hypothesis is therefore that prices reflect information up to the point where the marginal benefits of acting on the information (the expected profits to be made) do not exceed the marginal costs of collecting it (Jensen 1978).

Secondly, what does it mean to say that prices are consistent with fundamentals? We must have a model to provide a link from economic fundamentals to asset prices. While there are candidate models in all asset markets that provide this link, no-one is confident that these models fully capture the link in an empirically convincing way. This is important since empirical tests of market efficiency – especially those that examine asset price returns over extended periods of time – are necessarily joint tests of market efficiency and a particular asset-price model. When the joint hypothesis is rejected, as it often is, it is logically possible that this is a consequence of deficiencies in the particular asset-price model rather than in the efficient market hypothesis. This is the 'bad model' problem (Fama 1991).

Lastly, comment about the word efficient. It appears that the term was originally chosen partly because it provides a link with the broader economic concept of efficiency in resource allocation. Thus, Fama began his 1970 review of the efficient market hypothesis (specifically applied to the stock market):

The informational efficiency has always been a debatable issue and speed and direction of stock price adjustments in reactions to various types of accounting information have been the key issues to be tested to examine the level of informational efficiency of the capital market. Several studies have empirically tested the reaction of security prices to the release of different information. Beaver (1968), Foster (1981), Ball and Brown (1968), Beaver, Clarke, Wright (1979) are some of the studies which find significant reaction in the studies is that during the announcement period, there are abnormal returns. On the Indian stock market, M. Obaidullah (1992), S.Srinivasan, and Kakati (2001), Jijo Lukose and Narayan Rao (2002) are some of the studies which have tested the efficiency of the Indian stock market with respect to corporate events announcement information like accounting information, dividend announcement, bonus announcement, right issue, mergers & acquisition and stock split etc.,

2. FINDINGS OF THE EARLIER STUDIES:

A company can issue bonus shares by utilizing retained earnings or accumulated capital reserves. The only correction caused by the bonus issue is that the numbers of outstanding stocks are adjusted by the bonus issue ratio. Thus, the stock prices decline on the basis of the same ratio (number of bonus stocks in the issue/number of existing stocks applicable for the bonus issue), but the value of the stocks held by an individual investor remains unaffected. Miller and Modigliani (1961) explained theoretically that bonus issues, along with other types of dividends declared by the companies, do not amend stockholders' wealth. Likewise, Sloan (1987) presented Australian evidence that bonus issues do not influence stockholders' wealth. However, many empirical studies revealed that the market normally reacts positively to the announcement of bonus issues or stock dividends (Fama et al., 1969; Foster and Vickrey, 1978; Woolridge, 1983; Eades et al., 1984; McNichols and Dravid, 1990; Obaidullah, 1992; Rao, 1994; and Anderson et al. 2001).

REVIEW OF LITERATURE

In the developed markets, especially in the United States, many studies have been conducted to test the efficiency of stock markets with respect to corporate event announcements. In India only very few studies have been conducted. Some of the select studies relevant to the present study are reviewed in this paper **Beaver (1968)** examined the reaction of the Trading Volume Activity (TVA) and Security Returns Variability (SRV) to annual earnings announcement with a sample of 143 New York Stock Exchange (NYSE) firms. The result indicated 33 percentage increases in TVA and 61 percent increase in SRV in earnings announcement week over the non-announcement weeks. A study entitled "The Random Walk Hypothesis and Technical Analysis" by **George E. Pinches (1970)** found that the random walk hypothesis implies that the price movements are virtually independent of past price movement. The study reveals that the random – walk hypothesis may be incorrect or, at least incomplete.

Obaidullah (1990), in his paper entitled, "The adjustment of stock price to half-yearly earnings announcement in India", studied 33 securities which performed well. The author has reported that earnings showed an increasing trend much before the announcement week. The study entitled "Random Walks in Stock Market Prices" by **Eugene F. Fama (1995)** found that random walks in stock market prices present important challenges to both the chartist and proponent of fundamental analysis. **Srinivasan.R (1997)**, in his study entitled, "Security Prices Behaviour Associated with Rights Issue – Related Events", examines security price behavior associated with rights issues related events and provides evidence on corporate capital structure, capital market efficiency and event study methodology. The author concludes that a rights issue of equity is seen as 'bad' news by investors and a rights issue of fully convertible debenture (FCD) is seen as 'neutral' news.

Eugene Pilotte (1997) in the study entitled, "Earnings and Stock Splits in the Eighties", presents evidence on the nature of the earnings information conveyed by stock splits. This paper presents evidence on the nature of the earnings information conveyed by splits during 1982-1989, a period of lower inflation and higher real economic growth. Results for 1982-1989 indicate that the market interprets stock splits as signals of subsequent earnings increase.

Elroy Dimson and Massoud Mussavian (1998), in their study entitled, “A brief history of market efficiency”, narrated that the efficient markets hypothesis is simple in principle but remains elusive. It is hard to profit from even the most extreme violations of market efficiency. The efficient markets model continues to provide a framework that is widely used by financial economists. An attempt was made by **Kun Shin Im, Kevin E.Dow and Varun Grover (2001)** in their study entitled “Research Report: A Reexamination of IT Investment and the Market Value of the Firm – An event study methodology” to evaluate the effectiveness of information technology investments. In this study, the researcher examined the changes in the market value of the firm as reflected in the stock price in response to IT investment announcements. Reactions of price and volume were negatively related to firm size and became more positive over time.

Lukose Jijo and Narayanan Rao.S (2002) in their study, “Market Reaction to Stock Splits – An Empirical Study”, have examined the reaction of stock prices around the date of announcement of stock splits and ex-split date. It was found out that on the date of announcement, there was an abnormal return of 5.27 percent and on day +1, 2.42 percent. The result of abnormal returns around the ex-split day shows that much of the abnormal returns take place on day 0 (3.68%) and day +1 (2.04%). A study by **Partrick Dennis (2003)** investigated the stock splits and liquidity in the case of the Nastaq -100 Index Tracking Stock and found that the average daily turn over before the split was 23.95 percent and after the split was 22.81 percent. A “t” test for difference in mean failed to reject the hypothesis that the turnover before the split (the t-statistic is 0.8) comparing the number of traders before and after the split. It is apparent that there was a little less than twice as many traders after the split than before.

A study entitled “Market Reaction to Stock Market Splits: Evidence from India” by **Amitabh Gupta and Gupta.O.P (2007)** maintains that stock splits are associated with positive abnormal returns around the announcement. By and large splits are found to improve the trading volume of shares and there was increase in the daily number of traders. But they do not increase the daily turnover and consequently the liquidity of stocks in India. At the end, the author concluded that the majority of shares which underwent split were trading at low market prices. It appears that reasons for a stock split by low priced companies could be explained by neglected firm hypothesis, which appears to be valid for the Indian stock market.

M.Raja, J.Clement Sudhahar & M.Selvam (2007), says an efficient market as a market in which price fully reflect all information. This means that no possibility exists of making sustainable excess returns and the prices follow a random walk. **Sujith Kumar S H and Dr. Sadanand Halageri(2009)**, that the security prices reacted to the announcement of stock splits. The reaction took place for a very few days surrounding day 0, remaining days it was extended up to +15. Thus the Indian stock markets in respect of Nifty constituent companies’ stocks are not perfectly efficient to the announcement of stock split. The above researchers have empirically verified the widely held notion that major events (economic and non-economic) cause substantial changes in returns. Total of 126 events, grouped into six types, have been studied over a fourteen-year period. The 630 (126 x 5) F-tests report only thirty-eight (38) statistically significant cases of volatility. In fact, these cases are evenly distributed both before and after the events, indicating that the selected events cannot be held responsible for causing such volatility.

In the light of the triple objectives outlined at the outset, the study conclusively proves the absence of significant volatility caused by major events. Even in instances where such volatility occurs, they do not linger beyond the third trading day post event. Out of the six major types of events, only budgets and macro-economic announcements cause a few cases of volatility more than others.

In India, studies on testing the semi-strong efficiency of stock market are few. These studies use CAR (Cumulative Abnormal Returns) Model. Only very few studies have used the SRV (Security Returns Variability) model. Most of the studies observed that the reaction by security prices took place prior to announcement of events. In some cases, reaction took place after announcement of events. An attempt is made in this study to test efficiency of Indian stock market with respect to Bonus announcement taking the models already used in the above studies.

3. OBJECTIVES OF THE STUDY:

The objectives of the present study are as follows

1. To examine the information content of Bonus announcement made by the nifty constituent companies.
2. To test the speed with which the Bonus announcement information are impounded in the share prices of nifty constituent companies.

4. HYPOTHESIS OF THE STUDY

The following hypotheses are to be tested in this study

1. Bonus announcement contained information's are not relevant for the valuation of stocks.
2. Bonus announcement has no significance influence in the stock prices of nifty constituent companies.
3. The Indian stock market is informationally not efficient where the Bonus announcement contained information's are not impounded instantaneously and rightly in the stock prices of nifty constituent companies.

5. METHODOLOGY:

SAMPLE SELECTION:

The study intends to cover the all the nifty constituent companies. Out of all the companies brought under nifty constituent companies listed as on 30th April 2011 (as per the Capitaline database, NSE website and BSE website), only 54 companies (Bonus Announcement) which satisfy the following criteria were selected.

SOURCES OF DATA

The information regarding adjusted share price, Bonus information, dates of Bonus announcements, and values of Nifty constituent companies were obtained from Capital line. Other relevant information's are also obtained from the NSE website, Money control.com books, BSE website and journals.

TOOLS USED FOR THE ANALYSIS:**a) DAILY RETURNS:**

The daily returns were calculated for both individual securities as well as Market Index using the following equation

$$R_{i,t} = \frac{P_t - P_{t-1}}{P_{t-1}} \times 100$$

Where,

$R_{i,t}$ = Returns on Security **i** on time **t**.

P_t = Price of the security at time **t**

P_{t-1} = Price of the security at time **t-1**

b) SECURITY RETURNS VARIABILITY

$$SRV_{i,t} = \frac{AR^2_{i,t}}{V(AR)} \times 100$$

$SRV_{i,t}$ = Security Returns Variability on security **i** in time **t**
 $AR^2_{i,t}$ = Abnormal Returns squared during the announcement period
 $V(AR)$ = Variance of Abnormal Returns during the announcement period

c) ABNORMAL RETURNS (AR): under **market-adjusted abnormal returns** is calculated using by the equation as below;

$$AR_{i,t} = R_{i,t} - R_{m,t}$$

Where,

$AR_{i,t}$ = Abnormal returns on security **i** at time **t**

$R_{i,t}$ = Actual returns on security **i** at time **t**

$R_{i,m}$ = Actual returns on market index, which is proxied by nifty, a weighted average index of 50 companies published by NSE, at time **t**.

Thus daily actual returns over the announcement period (31days) were adjusted against their corresponding market returns.

d) AVERAGE SECURITY RETURNS VARIABILITY (ASRV)

The $SRV_{i,t}$ so calculated for all the Bonus announcement are averaged to find the Average Security Returns Variability ($ASRV_t$) by using the following equation.

$$ASRV_t = \sum SRV_{i,t} \times (1/n)$$

Where,

$ASRV_t$ = Average Security Returns Variability at time **t**

$SRV_{i,t}$ = Security Returns Variability **i** security at time **t**

n = Number of Bonus announcement in the sample

e) AVERAGE ABNORMAL RETURNS:

The Average Abnormal Returns is calculated by the equation given below

$$ASRV_t = SRV_{i,t} \times (1/n) \sum_{t=1}^n AR_{i,t}$$

Where,

$$t = 1$$

AAR_t = Average Abnormal Returns on day **t**

AR_{i,t} = Abnormal Returns on security **i** at time **t**

f) CUMULATIVE ABNORMAL RETURNS (CAR):

The CAR is calculated as

$$CAAR_k = \sum_{t=1}^n AAR_t$$

Where,

- CAAR_k = Cumulative Average Abnormal Returns for the **k**th period. Hereafter, it is referred to as CAR,
- AAR_t = Average Abnormal Returns of sample Bonus announcement at time **t** which is calculated by using the above equation

g) T-TEST

- a) The significance of reaction in security prices (ASRV_t) is tested by using the SPSS Package
- b) The significance of the AAR_t is tested using SPSS Package

6) RESULTS AND DISCUSSIONS:

The analysis has been done in the following way to empirically test the informational efficiency of the Indian capital market with special reference to the shares of Nifty constituent companies

- a) Analysis of Average Security Returns Variability (ASRV or SRV)
- b) Analysis of Abnormal Returns (AAR)
- c) Analysis of Cumulative Abnormal Returns (CAR)

ANALYSIS OF ASRV FOR BONUSANNOUNCEMENT:

Table-1- It explains the value of ASRV and t-value to Bonus announcement. ASRV is highest on day - 12(1..3449) further, in Pre announcement period ASRV is greater than one during -13, -12, -11, -5, -4, -3, -2, and-1. From the table it is clear that market received Bonus information positively during the pre announcement period. During the post announcement period, ASRV has been more than one for 6 days According to the present study. Bonus Announcement has immediate reactions in the security prices of Nifty constituent companies. Hence investors are advised to take immediate decision (whether to buy or sell) at the time of companies' coming up with bonus announcement.

The above analysis reveals the fact that the market has absorbed the bonus announcement information around the announcement days. Hence the hypothesis -1 entitled “Bonus announcement contained information’s are not relevant for the valuation of stocks” is rejected.

Table 1: ASRV and t-value.

Days	ASRV	T- Value	Decision
-15	0.721298	4.772	Rejected
-14	0.832901	5.353	Rejected
-13	1.013763	4.280	Rejected
-12	1.344963	3.212	Rejected
-11	1.069408	4.617	Rejected
-10	0.760031	5.282	Rejected
-9	0.567716	6.246	Rejected
-8	0.98758	4.774	Rejected
-7	0.954971	5.905	Rejected
-6	1.2712	4.341	Rejected
-5	1.266613	5.358	Rejected
-4	1.112655	5.606	Rejected
-3	1.077548	5.328	Rejected
-2	1.427984	3.188	Rejected
-1	0.98604	3.809	Rejected
0	2.339698	4.957	Rejected
1	1.552206	5.772	Rejected
2	0.807486	5.209	Rejected
3	1.096	4.448	Rejected
4	0.47821	4.798	Rejected
5	0.717876	5.319	Rejected
6	1.15014	5.755	Rejected
7	0.710905	4.449	Rejected
8	0.735777	5.066	Rejected
9	1.163423	5.627	Rejected
10	0.857399	3.965	Rejected
11	1.114085	4.405	Rejected
12	0.452283	4.534	Rejected
13	0.711743	4.348	Rejected
14	1.626977	3.889	Rejected
15	0.697812	3.283	Rejected

Source: Data from Capitaline. Computed in SPSS Package

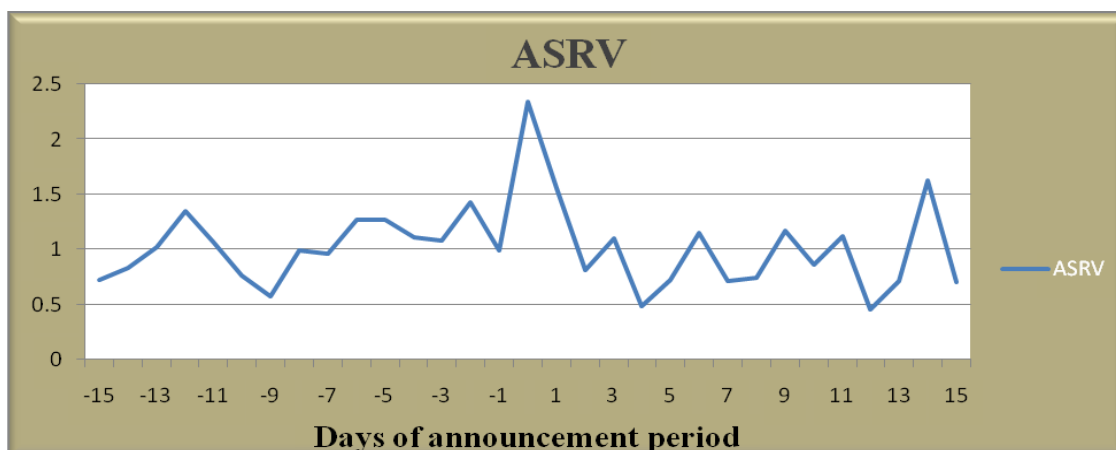
FIGURE 1: AVERAGE SECURITY RETURN VARIABILITY

Figure-1 shows the ASRV of bonus announcement. It is clearly understood from the above figure that there was sharp variation in the ASRV on day -9, -7, -5, -3, -1, 1 and 3, followed by minor variation in the post announcement period. It is evident from the above result that market was using the bonus information for valuation of Nifty constituent companies' stocks

ANALYSIS OF AAR FOR BONUS ANNOUNCEMENT:

Table-2 depicts the analysis of average abnormal returns along with t-test for bonus announcement of nifty constituent companies. The values of AAR presented in Table 2 and Figure 2 shows that they are fluctuating yielding both positive and negative return around the event day. During the 31 days selected for the study, the AAR are positive for 20 days and negative for 10 days. This indicates that they are positive for more number of days than negative both before and after the event day. Therefore trend indicates that it is possible to earn positive on majority of the days surrounding the event day.

It is clearly understood from the table that there was no significant abnormal returns almost all the days (from day -15 to day +15) surrounding the bonus announcement i.e., the value of abnormal returns was below one almost all the days. It is clear from the t-test analysis that bonus announcement did not generate any significant reaction in the security prices of Nifty constituent companies. However, AAR varies from -0.69 to 1.96 during the bonus announcement period. It is clearly understood from the above analysis that the value of AAR during pre and post announcement period was less than 1 in most of the cases. It reveals the fact that the announcement of bonus did not meet with significant reactions in the security prices of sample nifty constituent companies. Hence the hypothesis -2 entitled, "Bonus announcement has no significant reaction in the security prices of Nifty constituent companies" is accepted.

TABLE 2: AVERAGE ABNORMAL RETURN

Days	AAR	AAR	Decision
-15	-0.69568	-1.378	Accepted
-14	0.348517	1.069	Accepted
-13	-0.50186	-.527	Rejected
-12	1.966399	1.083	Accepted
-11	0.337171	.984	Accepted
-10	0.228809	.755	Accepted
-9	-0.01021	-.041	Rejected
-8	0.232727	.686	Accepted
-7	-0.16181	-.422	Accepted
-6	0.367858	.893	Accepted
-5	0.752543	2.081	Accepted
-4	0.220254	.549	Accepted
-3	0.175831	.454	Accepted
-2	0.861661	2.083	Accepted
-1	0.576634	1.595	Accepted
0	1.064488	2.213	Accepted
1	-0.01637	-.038	Rejected
2	-0.3664	-.834	Accepted
3	-0.3311	-.600	Accepted
4	0.744612	1.414	Accepted
5	-0.32292	-1.074	Accepted
6	-0.07392	-.180	Accepted
7	0.12843	.431	Accepted
8	-0.61401	-2.273	Accepted
9	0.224611	.655	Accepted
10	0.065339	.238	Accepted
11	0.279651	.811	Accepted
12	0.206644	.651	Accepted
13	0.099513	.319	Accepted
14	0.387841	.706	Accepted
15	0.023523	.076	Rejected

Source: Data from Capitaline. Computed in SPSS Package

Figure-2 graphically represents the AAR of bonus announcement. It is clearly understood from the above figure that -12 and -11 there has been a significant reaction and in other days there has been no significant reaction in the security prices of sample Nifty constituent companies for bonus announcement because the AAR curve for bonus announcement falls below one throughout the study period except on -12th day. The result reveals the fact that the market not using the bonus announcement information for valuation of Nifty constituent companies' stocks.

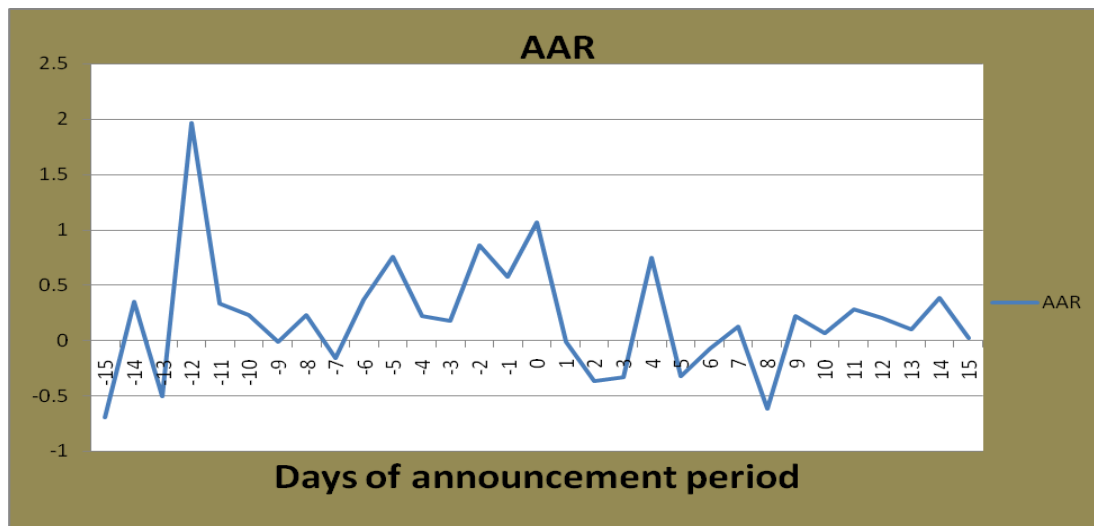
FIGURE 2: AVERAGE ABNORMAL RETURN:**CUMULATIVE AVERAGE ABNORMAL RETURN:**

Table 3 depicts the cumulative average abnormal return for bonus announcement for Nifty constituent companies' stocks. The CAAR analysed for pre announcement period and post announcement period. Both in pre and post announcement period, the values are positive except during the -15 to -13 the event day. Some of the stocks might have influenced the overall result of the study. Individual stocks might have some external information. These external information's are outside the scope of the present study. On the day of announcement the value of CAAR is 13.7881. The value of CAAR ranged from 0.2241 to 19.7073 and no negative CAAR on most of the days the study period.

TABLE 3: CUMULATIVE AVERAGE ABNORMAL RETURN

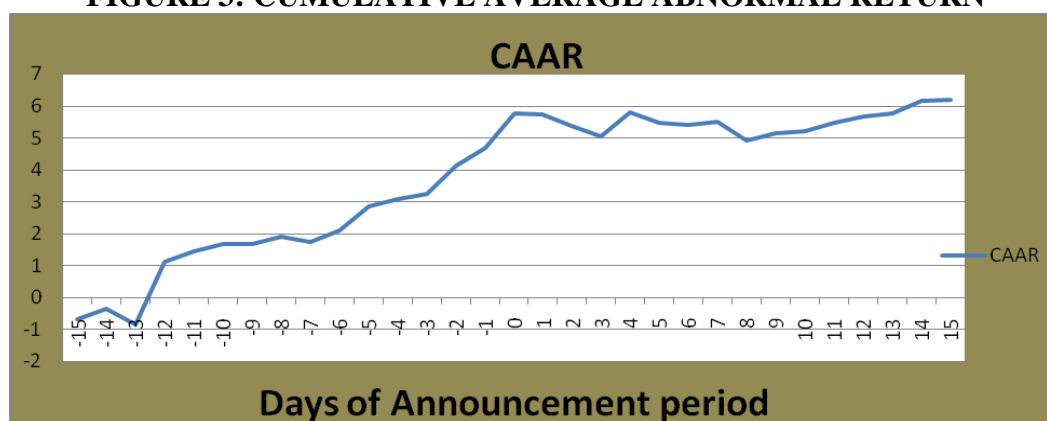
Days	CAAR
-15	-0.69568
-14	-0.34716
-13	-0.84902
-12	1.117377
-11	1.454548
-10	1.683357
-9	1.673151
-8	1.905878
-7	1.744068
-6	2.111925
-5	2.864468
-4	3.084722
-3	3.260554
-2	4.122215
-1	4.698848
0	5.763336
1	5.746964
2	5.380568
3	5.049466
4	5.794078
5	5.471154
6	5.397231
7	5.52566
8	4.911647
9	5.136258
10	5.201597
11	5.481248
12	5.687893
13	5.787405
14	6.175246
15	6.198769

Source: Data from Capitaline. Computed in SPSS Package

From the above analysis, it is inferred that bonus announcement might have had favourable information (Positive), and hence investors reacted positively to the bonus announcement. This shows the fact that the Indian stock market was able to analyse the stock split announcement information and use it for revision of security prices.

Figure-3 shows the curve of cumulative average abnormal returns of share price for bonus announcement. The curve of CAAR for bonus announcement continuously increased with some corrections during the announcement period of 31 days. The result of t test combined with that of the analysis of the movement of ARR and CAAR presented above gives the enough evidence to show that bonus announcement is not incorporated into security prices as fast as EMH envisages. As bonus announcement is publicly available information, the analysis in this study has shown that the Indian stock market is slow in reflecting this in the security prices. As the Indian stock market exhibits learning lags in incorporating value changing information contained in bonus announcement. Hence the hypothesis “semi-strong form of EMH holds in the Indian Stock market” is rejected

FIGURE 3: CUMULATIVE AVERAGE ABNORMAL RETURN



7) SUMMARY AND CONCLUSION:

The financial market has received well deserved attention in western economies but not in India. While number of researcher studies proved that financial market are efficient in reflecting and incorporating value changing information swiftly, but the real activity in the market cast doubt on the existence of efficient market. This has created interest among the analyst and researcher to understand the market mechanism and degree to which this market exhibits efficiency. This paper examines the semi-strong form of market efficiency by taking response to the bonus announcement. The companies which part of the Nifty have been considered for the research. Out of the fifty constituent companies, totally 54 bonus announcement have been studied by using event study methodology. The result of the study showed the fact that the security prices reacted to the announcement of bonus. The reaction took place for a very few days surrounding day 0, remaining days it was extended up to +15. Thus one can conclude from the forgoing discussion that the Indian stock markets in respect of Nifty constituent companies' stocks are not perfectly efficient to the announcement of bonus. However, the behaviour of the CAAR before the event day exhibits some of the features of efficient market which are not sustained after the event day. The investor can use bonus announcement to make the abnormal return by using the buy and hold strategy. This can be used by the investors and analyst to make the abnormal profit at any point during the announcement period by acting quickly in the market. To conclude Nifty - a bench mark index of Indian stock market is not perfectly efficient to capture the all available information

in the market. Hence, an intelligent investor by acting very quickly in the market can make an abnormal profit to some extent.

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