

# AN EMPIRICAL TEST OF INDIAN STOCK MARKET EFFICIENCY IN RESPECT OF BONUS ANNOUNCEMENT

**M. Raja<sup>1</sup>**

*Bharathidasan University College (Lalgudi), India.*

E-mail: [rajacommerce@yahoo.co.in](mailto:rajacommerce@yahoo.co.in)

**J. Clement Sudhahar<sup>2</sup>**

*Karunya University, India.*

E-mail: [Clement@karunya.edu](mailto:Clement@karunya.edu)

## I. ABSTRACT

A capital market is said to be efficient with respect to an information item if the prices of securities fully impound the return implications of that item. The efficiency with which the capital formation is carried out depends on the efficiency of the capital markets and financial institutions. A capital market is said to be efficient with respect to corporate event announcement (stock split, buyback, right issue, bonus announcement, merger & acquisition, dividend etc) contained information and its disseminations. How quickly and correctly the security prices reflect these event contained information show the efficiency of stock markets. Present study is an attempt to test the efficiency of Indian stock market with respect to bonus issue announcement by IT companies.

**Key words:** Market Reaction/Stock Price Reaction, Abnormal Returns, Announcement Period, Efficient Market, bonus announcement.

**JEL codes:** G14, G15

## II. INTRODUCTION

The economic development of any country depends upon the existence of a well organized financial system. An efficient functioning of the financial system facilitates the free flow of funds to more productive activities and thus promotes investment. The financial system may be viewed as a multistoried structure consisting mainly of financial institutions and financial markets. Indian capital markets have undergone transformation rather dramatically in the last decade. The number and variety of

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<sup>1</sup> Dr. M. Raja, M. Com., M. Phil., Ph.D., Assist. Professor, Bharathidasan University College (Lalgudi), Tiruchirapalli, India.

<sup>2</sup> Dr. J. Clement Sudhahar, MBA., M. Phil., Ph.D., Associate Professor, Head-Marketing Area, School of Management, Karunya University, Coimbatore-114, India.

players have increased. The growth in the foreign institutional investors, mutual funds and the privatization of insurance sector, have facilitated the induction of more institutional players in the markets. Further, it is interesting to state that focus on higher level of accountability, information disclosure, corporate governance and shareholder value has also gone up on par with world standards.

A capital market is said to be efficient with respect to an information item if the prices of securities fully impound the returns implications of that item. In an efficient market, when a new information item is added to the market, its revaluation implications for security returns are instantaneously and unbiasedly impounded in the current market price. Several studies have empirically tested the reaction of security prices to the release of different information. Eugene Fama (1960) classifies the market efficiency into the following three categories depending on the information set that is fully reflected in the security prices.

- a. **Weak Form of efficiency**, popularly known as Random Walk Theory, is the category in which the current stock prices reflect all the information that is contained in the historical sequence of prices.
- b. **Semi Strong Form of efficiency** is the category in which current market prices not only reflect all information content of historical prices but also reflect all the information, which are publicly available about the companies being studied.
- c. **Strong Form of efficiency**, is the category in which current market prices reflect all information whether it is publicly available or private information (insiders information).

### III. LITERATURE SURVEY

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 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. McEnally (1971) and Beaver, Clarke and Wright (1979) report significant contemporaneous correlations between the magnitude and sign of unexpected annual earnings changes and the magnitude and sign of abnormal returns in the period preceding the annual earnings release. Edward M. Miller (1979) in his study argues that any non-random fluctuation in price (other than a steady upward drift approximating the risk adjusted rate of returns) would be exploited by speculators who would buy before an expected fall, eliminating any predictable functions and making all price changes random. Obaidullah (1990) 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. Elroy Dimson and Massoud Mussavian (1998), in their study 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.

Abhijit Dutta (2001) has examined the investors’ reaction to information using primary data collected from 600 individual investors and observes that the individual investors are less reactive to bad news as they invest for longer period. Hari Om Chaturvedi (2000), in his doctoral thesis, observed that the cumulative abnormal returns (CAR) between the portfolios with positive and negative unexpected half-yearly earnings were significant. Prabina Das, S. Srinivasan and A. K. Dutta (2000) have studied the reaction of GDR prices and the underlying share prices to the announcement of dividends and found that the CAR for the GDR is mostly negative irrespective of the rate of dividend whereas the domestic share prices react in a more synchronous manner. An attempt was made by Kun Shin Im, Kevin E. Dow and Varun Grover (2001) in their study, 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. Jijo Lukose and Narayan Rao (2002) examined the security price behaviour around the announcement of stock splits and around ex-split date. They find that there are 7.69 percent abnormal returns during the two days (i.e. the day of announcement of stock split and the next day).

#### **IV. RESEARCH METHODOLOGY**

##### **A. Statement of the Problem**

Capital market, being a vital institution, facilitates economic development. It is true that so many parties are interested in knowing the efficiency of the capital market. The small and medium investors can be motivated to save and invest in the capital market only if their securities in the market are appropriately priced. The information content of events and its dissemination determine the efficiency of the capital market. That is how quickly and correctly security prices reflect these information show the efficiency of the capital market. In the developed countries, many research studies have been conducted to test the efficiency of the capital market with respect to information content of events. Whereas in India, very few studies have been conducted to test the efficiency of the capital market with respect to stock split announcements, even after these studies have been conducted with different industries with different period. Hence present study is an attempt to test the efficiency of the Indian stock market with respect to information content of bonus issue announcements by IT (Information Technology) companies for particular period (2000-2007).

**B. Objectives of the study**

- 1) To examine the information content of bonus issue announcement made by the Information Technology (IT) companies
- 2) To test the speed with which the bonus issue announcement contained information impounded in the share prices of IT companies.
- 3) To suggest investment strategies for the investors, fund managers and analysts.

**C. Hypotheses of the study**

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

**D. Sample Selection**

The study intends to cover the all the IT companies listed in Bombay Stock Exchange (BSE). Out of all the companies brought under Information Technology listed in the BSE as on 30 December 2007 (as per the PROWESS database), only 43 companies, which satisfy the following criteria were selected.

- i. The companies, which find a place in the list A and B1 of the Bombay Stock Exchange (BSE), are selected. The reason for selecting the list A and B1 is to ensure active trading,
- ii. Availability of the dates of announcement of bonus issue, and
- iii. Availability of Bonus issue announcement information

The information regarding adjusted share price, bonus issue information, dates of bonus issue announcements, and values of BSE 500 were obtained from "PROWESS" published by CMIE. Other relevant information is obtained from the BSE website (<http://www.bseindia.com/>), books, and journals.

**E. Tools used for the Analysis:**

**i. Daily returns**

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

$$R_{i,t} = \frac{P_t - P_{t-1}}{P_{t-1}} \times 100 \dots\dots\dots (1.0)$$

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  $t-1$

**ii. Security Returns Variability**

SRV model is used to know the reaction of the market. Symbolically, the model is

$$SRV_{i,t} = \frac{AR^2_{i,t}}{V(AR)} \dots\dots\dots (1.1)$$

Where,

$SRV_{i,t}$  = Security Returns Variability of security  $i$  in time  $t$

$AR^2_{i,t}$  = Abnormal returns on security  $i$  on day  $t$

$V(AR)$  = Variance of Abnormal Returns during the announcement period

Abnormal Returns (AR) under **market-adjusted abnormal returns** is calculated using by the equation as below;

$$AR_{i,t} = R_{i,t} - R_{m,t} \dots\dots\dots (1.2)$$

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 BSE 500, a weighted average index of 500 companies published by BSE, at time  $t$ .

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

**iii. Average Security Returns Variability (ASRV)**

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

$$ASRV_t = SRV_{i,t} \times (1/n) \dots\dots\dots (1.3)$$

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 issue in the sample

**iv. Average Abnormal Returns:**

The Average Abnormal Returns is calculated by the equation given below

$$AAR_t = \frac{1}{n} \sum_{t=1}^n AR_{i,t} \dots\dots\dots (1.5)$$

Where,

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

$AR_{i,t}$  = Abnormal Returns on security  $i$  at time  $t$  which is calculated by using the equation (1.2)

**v. Cumulative Abnormal Returns (CAR)**

The CAR is calculated a

$$CAAR_k = \sum_{t=1}^k AAR_t \dots\dots\dots (1.7)$$

Where,

$CAAR_k$ =Cumulative Average Abnormal Returns for the  $k^{th}$  period.

$AAR_t$  = Average Abnormal Returns of sample bonus issue at time  $t$  which is calculated by using the equation (1.5)

**T-Test**

i). The significance of reaction in security prices ( $ASRV_t$ ) is tested by using the T-statistics as follows:

$$t_{stat} = (ASRV - 1) \times \sqrt{n} / s \dots\dots\dots (1.4)$$

Where,  $n$  is the number of bonus issue in the sample and  $s$  is the Standard Deviation of abnormal returns.

ii). The significance of the  $AAR_t$  is tested using the t-test as follows;

$$t_{stat} = AAR_t \times \sqrt{n} / s \dots\dots\dots (1.6)$$

Where,  $AAR_t$  is the Average Abnormal Returns on time  $t$ ,  $n$  is the number of bonus issue in sample and  $s$  is the Standard Deviation of Average Abnormal Returns.

**Limitations of the Study**

- 1) The present study is confined to only one event announcement
- 2) This study is restricted with only IT industry
- 3) All the limitations of the tools used are applicable to this study

**V. RESULTS AND DISCUSSION**

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 selected IT Companies.

- a. Analysis of Average Security Returns Variability (ASRV)

- b. Analysis of Abnormal Returns (AAR)
- c. Analysis of Cumulative Abnormal Returns (CAR)

### A. Security Return Variability

One of the major objectives of this study is to examine the information content of corporate events announced by sample IT (Information Technology) companies. If corporate events contain information relevant for the valuation of securities, the stock market may use that information to revise the prices of securities. According to the semi-strong form of efficient market hypothesis, the market is said to be efficient if prices reflect all the publicly available information instantaneously and unabashedly. One of the important methods used to examine the relevance of events announcement information to valuing the security prices is Security Return Variability (SRV). The variability of security returns during the announcement period (15 days before the announcement, the day of announcement, and 15 days following the announcement) were calculated using the equation 1.1.

### Analysis of ASRV for Bonus Issue

The results of ASRV and t value for bonus issue announcement are given in **Table 1**. It is clearly understood from the above analysis that IT stocks captured the bonus announcement contained information on day 1, 4, 5, 14 and 15. The values of ASRV during these days were 1.23, 1.17, 1.17, 1.38 and 1.44 respectively. The ASRV was significant at 10 percent level on day -15, -14, -7 -4 -2, 0, 1, 4, 14 and day 15. Further, it was significant at 5 percent level only on day -6. The highest value of ASRV during the 31 days of announcement was recorded on day -6 with a value of 1.75, followed by day -15, -2, 15, 14 and 1 with ASRV value of 1.53, 1.48, 1.44, 1.38 and 1.23. Further, the value of ASRV gained greater than one consistently during pre announcement period for five days (day -7 to day -1), except day -5 and -3, with ASRV value of 1.29, 1.75, 1.33, 1.48, and 1.11. It is interesting to note that the value of ASRV exceeded one the day after the announcement day (day +1) with a value of 1.23. Therefore, it is presumed that the market captured the bonus announcement contained information immediately after its announcement. It is inferred that the bonus announcement contained information relevant for valuation IT companies' securities. From the above analysis, investors are advised that when the company comes up with the bonus issue, the investor should take immediate investment decision (buy or sell) in order to benefit from the bonus issue announcement.

The results of ASRV for bonus announcement are presented in **Figure 1**. The figure clearly shows that the market positively absorbed the bonus issue contained information during the pre announcement period. The analysis of average value of ASRV for bonus announcement is given in the **Table 2**. The foregoing discussion reflects the following:

- (i) Bonus issue announcement by IT companies contain information's are useful for valuing the securities.

- (ii) Capital market for IT companies stocks reacted heavily only on the day of the bonus announcement (day 0) and also on the next day of the announcement (day 1).
- (iii) However, the reaction on day 0 is much greater than on day 1.

### B. Average Abnormal Return

Security Returns Variability (SRV) model was used to find out whether bonus issue announcement information is useful or not for valuing security prices of sample IT companies. **Table 3** shows the analysis of abnormal returns for bonus announcement of IT companies. **Figure 2** depicts the fact that the market gained significant reactions in the security prices during the pre and post announcement periods. The result of average AAR for bonus announcement is given in **Table 4**. The following are the outcome of the discussion presented in the table.

- (i) IT companies positively received the bonus announcement information before the announcement came up and from day -5 to day -1, the security prices significantly reacted.
- (ii) The bonus announcement contained information made by the sample IT companies are useful for valuing the securities
- (iii) For bonus announcement the market was react quickly during post announcement period
- (iv) The reaction was extended to up to +15 days for bonus announcement by IT companies
- (v) Information of Bonus announcement can be used by the investors for making abnormal returns at any point of the announcement period, through the strategy of short selling.

**Table 1. Result of ASRV and t - Value for Bonus Announcement**

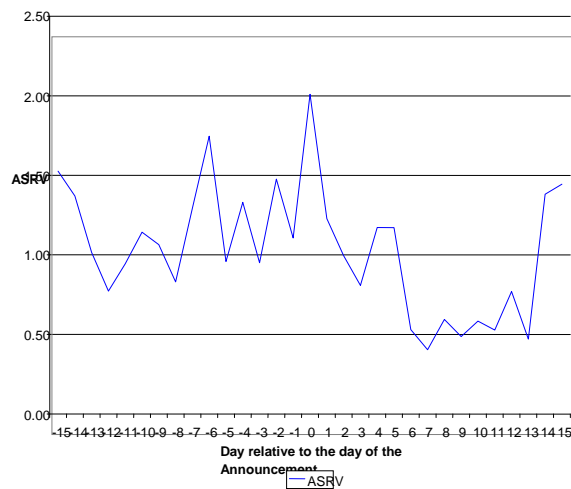
Day	ASRV	t - value	Day	ASRV	t - value	Day	ASRV	t - value
-15	1.53	1.27@	-5	0.96	-0.09	5	1.17	1.21
-14	1.37	1.32@	-4	1.33	1.41@	6	0.53	-0.57
-13	1.01	0.04	-3	0.95	-0.09	7	0.40	-0.69
-12	0.77	-1.01	-2	1.48	1.42@	8	0.59	-0.46
-11	0.94	-0.19	-1	1.11	1.08	9	0.49	-0.55
-10	1.14	0.48	0	2.01	1.48@	10	0.58	-0.43
-9	1.06	0.16	1	1.23	1.35@	11	0.53	-0.46
-8	0.83	-0.46	2	0.99	-0.01	12	0.77	-0.22
-7	1.29	1.43@	3	0.81	-0.27	13	0.47	-0.49
-6	1.75	1.72**	4	1.17	1.23@	14	1.38	1.30@
						15	1.44	1.37@

\* -1%      \*\* -5% @ -10%

Source: Computed from PROWESS data base



**Figure 1. Average Security Return Variability of Bonus Issue Announcement**



**Table 2. Average Value of ASRV for Bonus Announcement**

PERIOD	ASRV
FROM DAY -15 TO DAY +15	1.04
FROM DAY -15 TO DAY -1	1.17
FROM DAY 0 TO DAY +15	0.91
FORM DAY -3 TO DAY +3	1.22
FROM DAY -7 TO DAY +7	1.14

Source: Computed from Table1

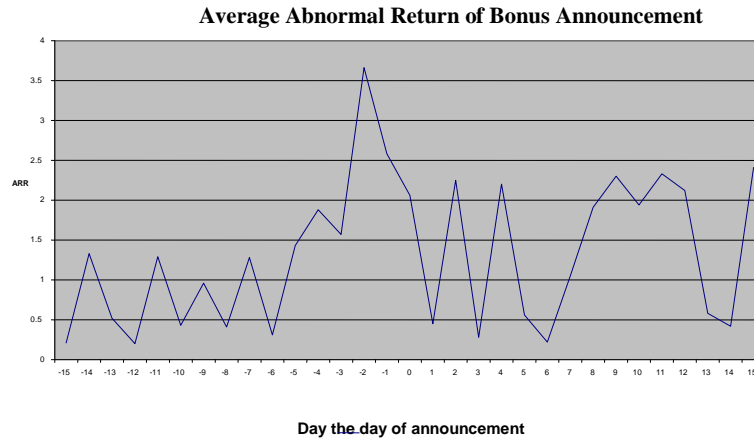
**Table 3. Average Abnormal Return and t-value for Bonus Announcement**

Day	AAR	T - value	Day	AAR	T - value	Day	AAR	T - value
-15	0.21	0.31	-5	1.43	1.35@	5	0.56	0.37
-14	1.33	1.15	-4	1.88	1.71**	6	0.22	0.11
-13	0.52	0.49	-3	1.57	1.54@	7	1.05	1.02
-12	0.20	0.10	-2	3.66	2.35*	8	1.91	1.61@
-11	1.29	1.10	-1	2.58	2.14**	9	2.30	2.12**
-10	0.43	0.40	0	2.06	1.93**	10	1.94	1.85**
-9	0.96	0.73	1	0.45	0.52	11	2.33	2.19**
-8	0.41	0.38	2	2.25	2.02**	12	2.12	2.08**
-7	1.28	1.20	3	0.28	0.16	13	0.58	0.50
-6	0.31	0.25	4	2.20	2.03**	14	0.42	0.37
						15	2.41	2.36*

\*-1%      \*\*-5%      @-10%

Source: Computed from "PROWESS" a corporate database

**Figure 2. Average Abnormal Return of Bonus Announcement**



**Table 4. Average Value of Average Abnormal Returns for Bonus Announcement**

PERIOD	AAR	PERIOD
FROM DAY -15 TO DAY +15	1.33	FROM DAY -15 TO DAY +15
FROM DAY -15 TO DAY -1	1.20	FROM DAY -15 TO DAY -1
FROM DAY 0 TO DAY +15	1.44	FROM DAY 0 TO DAY +15
FORM DAY -3 TO DAY +3	1.84	FORM DAY -3 TO DAY +3
FROM DAY -7 TO DAY +7	1.45	FROM DAY -7 TO DAY +7

Source: Computed from Table-3

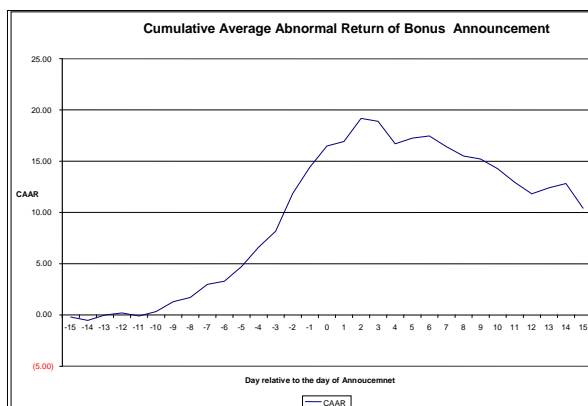
**C. Analysis of Cumulative Average Abnormal Return for Bonus Announcement**

The result of cumulative average abnormal returns (CAAR) for bonus announcement is exhibited in the Table 5. The value of cumulative average abnormal returns during the pre announcement period ranged from -2.11 to 12.4. On the day of announcement (day 0), the CAAR for bonus announcement was 14.46 and it increased to 17.16 on day 2. This shows that market immediately reacted to the bonus announcement contained information. The results of CAAR for bonus announcement are graphically represented in the Figure-3 and the average values of CAAR in respect of bonus issue are depicted in Table 6.

**Table 5. Cumulative Average Abnormal Returns for Bonus Announcement**

Day	CAAR	Day	CAAR	Day	CAAR
-15	-0.21	-5	2.71	5	15.24
-14	-1.54	-4	4.59	6	15.46
-13	-1.02	-3	6.16	7	14.41
-12	-0.82	-2	9.82	8	12.5
-11	-2.11	-1	12.4	9	10.2
-10	-1.68	0	14.46	10	8.26
-9	-0.72	1	14.91	11	5.93
-8	-0.31	2	17.16	12	3.81
-7	0.97	3	16.88	13	4.39
-6	1.28	4	14.68	14	4.81
				15	2.4

Source: Computed from "PROWESS" a corporate database

**Figure 3. Cumulative Average Abnormal Return of Bonus Announcement****Table 6 Average Value of Cumulative Average Abnormal Returns for Bonus Announcement**

PERIOD	AAR
FROM DAY -15 TO DAY +15	6.61
FROM DAY -15 TO DAY -1	1.97
FROM DAY 0 TO DAY +15	10.97
FORM DAY -3 TO DAY +3	13.11
FROM DAY -7 TO DAY +7	10.74

Source: Computed for Table - 5

## **VI. CONCLUSION**

This study has empirically examined the informational efficiency of capital market with regard to bonus issue announcement released by the IT companies. The results of the study showed that the security prices reacted to the announcement of bonus issue. Thus one can safely conclude from the foregoing discussions that the Indian capital market for the IT sector, in general, are efficient, but not perfectly efficient, to the announcement of bonus issue. This informational inefficiency can be used by the investors for making abnormal returns at any point of the announcement period.

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