# AN EMPIRICAL ANALYSIS OF MARKET REACTION AROUND THE BONUS ISSUES IN INDIA

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Abstract

*Past researches have revealed significant abnormal returns for bonus issues even though the bonus issue date is known in advance and the distribution contains no new information. This study examines the stock price reaction to the information content of bonus issues with a view of examining the Indian stock market is semi-strong efficient or not. The period of the study is June 1998 to August 2004. Samples of 46 bonus issues have been used to study the announcement effect by using event study methodology. The results indicate that there are significant positive abnormal returns for a five-day period prior to bonus announcement in line with evidence from developed stock market. On the announcement day the average abnormal return of -0.10% is observed. The results provide stronger evidence of semi-strong market efficiency of the Indian stock market.*

## 1. Introduction

Over the years relationship between bonus issues and stock prices has been the subject of much empirical discussion within the finance literature. According to theory, bonus issues increase the number of equity stocks outstanding but have no effect on stockholder's proportional ownership of stocks. The bonus issue date is known well in advance and therefore should contain no new information. As such, one would not expect any significant price reaction on bonus issue announcement. Contrary to this theoretical prediction, however empirical studies of bonus issues and stock dividends have documented a statistically significant market price reaction.[1] It is therefore a matter of concern that firms announcing bonus issues experience rise in their stock prices on an average supporting semi-strong form Efficient Market Hypothesis (EMH).[2]

Generally, the investigation of semi-strong form market efficiency has been limited to the study of well-developed stock markets. The aim of this paper is to examine the stock price reaction to information release of bonus issues with a view of examining whether the Indian stock market is semi-strong efficient or not. The event study methodology (Dolley 1933; Fama et al. 1969; and Brown and Warner 1980, 1985) has been used to contribute further evidence on the efficiency characteristics of the Indian stock market.

The paper is organized as follows. The next section describes the bonus issue and informational content. Section 3 reviews the pertinent literature. Section 4 describes the sample data and methodology employed in this paper. Section 5 discusses the results of the strong-form market efficiency tests on the announcement of bonus proposals for sample companies. The conclusions are presented in Section 6.

1 Bonus issues are widely referred to as stock dividends in the United States and many other countries and scrip issues in the U.K. In this literature review, the terminology stock dividend will be used if this is the terminology contained in the research reviewed.

2 According to the Efficient Market Hypothesis (EMH), if the stock prices reflect the announcement of public information instantaneously and unbiasedly, the market should be classified as semi-strong form efficient market. (Fama (1970)).

## 2. Bonus Issues and Informational Content

Bonus issues are simply distributions of additional stocks made to existing stockholders in proportion to their current investment. A company can distribute bonus stocks by using retained earnings or accumulated capital reserves. If a company distributes a bonus issue by using retained earnings, it makes a book entry to allocate retained earnings into paid-up capital in the stockholders' equity section of the company balance sheet. Alternatively, a company if decides to distribute a bonus issue by using accumulated capital reserves, it adjusts the accumulated capital reserves into paid-up capital. In both the cases the company does not receive any cash. Thus they result in each stockholder holding a greater number of stocks, but with more stocks on issue their relative claim on the assets of the company is smaller. There is no effect on stockholder's proportional ownership of stocks, capital structure and financial position of company. Since bonus issues do not enhance earning power, change the firm's capital structure, or result in expense reductions, the total market value of the firm in absence of information asymmetries should remain the same.[1] Only modification triggered by the bonus issue is that the number of outstanding stocks is adjusted by the bonus issue ratio, therefore, the price of the stocks declines according to the same bonus issue ratio.[2] The total market value of the stocks or the value of the stocks that are held by each investor should remain unchanged. Miller and Modigliani (1961) demonstrated theoretically that bonus issues, along with other types of dividends, do not alter stockholder wealth. Sloan (1987) provided Australian evidence that bonus issues do not affect stockholders' wealth.

However, empirical researches have shown that the market generally reacts positively to the announcement of a bonus issue/stock dividend. (see for example, Fama, Jensen, and Roll (1969); Peterson (1971); Foster & Vickrey (1978); Woolridge (1983); Eades, Hess and Kim (1984); Grinblatt, Masulis and Titman (1984); Asquith, Healy and Palepu (1988); Ball, Brown and Finn (1977); McNichols & Dravid (1990); Masse et al (1997);

[1] In fact in the absence of information asymmetries, it is likely that bonus issue announcements are detrimental to stockholders wealth. The costs that stockholders absorb indirectly and directly are rather significant

[2] Bonus ratio is the number of bonus stocks in the issue/number of existing stocks applicable for the bonus issue.

Anderson et al (2001); Lijleblom (1989); Ramachandran J. (1985); Obaidullah (1992) and Rao (1994)). These findings raise the question that what causes the market to react positively to bonus issue announcements. Several hypotheses have been advanced to answer this question. The hypotheses that has received strongest support in explaining the positive market reaction to bonus issue announcements is the *signalling hypothesis* (Foster & Vickrey (1978); Grinblatt, Masulis and Titman (1984); Woolridge (1983); Lijleblom (1989); McNichols & Dravid (1990); Masse et al (1997)) which suggests that 'the announcement of a bonus issue conveys new information to the market in instances where managers have asymmetric information'. This hypothesis has received almost unequivocal support with few exceptions (for example, Papaioannou, Travlos and Tsangarakis (2000)[1]). Ghosh and Woolridge (1988); Banker, Das, and Datar (1993) have supported *cash substitution hypothesis* which suggests that firms can conserve cash by issuing a stock dividend as a temporary substitute for an existing or contemplated cash dividend. Lakonishok and Lev (1987) investigated *liquidity hypothesis*, which suggests that stock dividend announcements are intended to improve liquidity, as the creation of additional stocks should lead to an increase in trading and greater ownership dispersion in a firm. Grinblatt et al. (1984); Doran and Nachtmann (1988) examined the *attention getting* hypothesis suggesting that managers use stock dividends to attract attention from professional analysts and to trigger a revaluation of their future cash flows. Both of them found positive market reaction to stock dividend announcements.

## 3. Literature Review

An increase in stock price following the announcement can occur because the announcement of a bonus issue may have beneficial informational content (Peterson 1971). Ball, Brown and Finn (1977) investigated stock price reaction around the announcement of 'stock capitalization changes' (bonus stock issues, stock splits and

[1] They argue that Greek companies are often required by law to issue stock dividends, and managers lack the discretionary power that US managers have to issue such dividends. Thus the announcements of stock dividends in Greece have little signaling benefit.

rights issues) in Australia for the period between 1960 and 1969 inclusive using monthly data. They found 20.2% abnormal return for 13 months up to including the month of bonus issue announcements.

Foster and Vickrey (1978) were among the earliest to examine the signaling hypothesis using daily returns data and in their examination of the information content of 82 stock dividend announcements, they found significant positive abnormal returns around announcement dates. Woolridge (1983) found a 0.986 percent positive average abnormal ex-date return for a sample of 317 stock dividends and postulate that the ex-date effect could arise from market imperfections such as taxes and odd-lot transaction costs. Grinblatt, Masulis, and Titman (1984) examined the ex-dates of stock dividends distributed from 1967 to 1976 and found an average abnormal return of 1.1 percent. This finding is also interpreted as evidence in favor of signaling hypothesis. Lijleblom (1989) investigated the signaling hypothesis by examining stock price reaction to stock dividends for firms that also released simultaneous 'contaminating' announcements, for example, 'simultaneous releases of past earnings'. Findings indicated significantly greater positive price reactions for the stock dividend-paying group than for the control group, which was interpreted as support for the signaling hypothesis in the presence of contaminating announcements. McNichols and Dravid (1990) find a positive relationship between the stock dividend factor and the announcement related abnormal return providing evidence that is consistent with a signaling explanation for stock dividends. A Canadian study by Masse et al. (1997), investigating the impact of stock dividend announcements on the value of firms listed on the Toronto Stock Exchange, found significant and positive abnormal returns around the announcement date. Rankine and Stice (1997) confirm the positive signaling value of stock dividends by documenting that for the stock distribution of the same size, those accounted for as stock dividends are associated with a significant larger announcement excess return than those accounted for as stock splits.

According to the market efficiency hypothesis, any market value effects caused by stock dividends must be fully discounted by the ex-dividend day. Hence, the stock price should

adjust on the ex-dividend day only to the level justified by the stock dividend percentage. Woolridge (1983b) tests this theoretical prediction and finds that the price adjustment is less than what is consistent with the stock dividend percentage. Moreover, he finds that stocks with smaller stock dividend percentages have higher excess returns. Eades, Hess and Kim (1984) report significantly positive ex-date returns by companies listed on the New York Stock Exchange during the period 1962 – 1980 for a sample of 2110 stock dividends and stock splits. Results were reported not just for the ex-day, but also for the five days either side of it. While it was found that ex-day itself exhibited the largest average abnormal return, the results indicated that positive abnormal returns were not confined to the ex-day but were significant on the day prior to it and on the two day subsequent to it. Lakonishok and Vermalen (1986) reported significant positive abnormal returns for a sample of 2,558 stock dividends and splits on each of the five days prior to the ex-day, the ex-day itself and the two days subsequent to it. Again they found the largest abnormal return on the ex-day itself. In line with this notion, Kryzanowski and Zhang (1996) document significant changes in trading patterns following stock splits, including fewer odd-lot trades and increases in small (trade value of less than $10,000) board-lot trading. In a related vein, Angel (1998) finds that market microstructure considerations determine when a stock split is appropriate, such as an optimal ratio of tick size to stock price. Thus, minimum price variation rules may help explain why stock prices vary substantially across countries. Similarly, Angel, Brooks, and Mathew (1997) find evidence that the higher volatility that has been documented following stock splits is a function of the different stock price regime and not due to the release of new information revealed on the ex-date about the stock's volatility. Frank and Jagannathan (1998) and Bali and Hite (1998) analyse stock returns on the ex-dividend day for US and Hong-Kong firms, respectively. Both studies develop models of investor behavior which are based on microstructure arguments (discreteness in trading prices and tick-size) and report positive abnormal returns consistent with such arguments.

Lakonishok and Lev (1987) investigated the liquidity hypothesis by examining trading volume changes after stock dividend announcements and found that trading volume did not increase as a result of stock dividends. They analysed the characteristics of the firms

that had stock dividends in comparison to the corresponding characteristics of firms without stock dividends. They found that (a) there is no significant difference in prices between the two groups; (b) there are no differences in marketability before or after the distribution of stock dividends. Grinblatt et al. (1984) examined the attention getting to justify positive market reaction to stock dividend announcements. Doran and Nachtmann (1988) using a sample of 879 firms which issued stock dividends and 898 firms that announced stock splits between 1971 and 1982 found that immediately after the announcement of a stock dividend there was a significant positive revision in earnings expectations similar to attention getting hypothesis. Ghosh and Woolridge (1988); Banker, Das, and Datar (1993) investigated the cash substitution hypothesis found that negative stock price reaction to dividend cuts and omissions could be offset or lessened by an announcement of a stock dividend as a substitute.

A few studies have been carried out in recent years to test the semi-strong form efficiency of the Indian stock market. Ramachandran (1985) examined the impact of announcement of bonus issues on equity stock prices and found mixed evidence for semi strong form efficiency of Indian stock market. Obaidullah (1992) documents positive stock market reaction to equity bonus announcements. He found evidence to support the semi-strong form EMH. Rao (1994) estimated cumulative abnormal return of 6.31% around the three days of bonus announcement. He reported that the Indian stock market responds in an expected direction to corporate announcements and it supported the semi-strong form of EMH. Rao and Geetha (1996) analyzed bonus announcements and concluded that one could not make excess money in the stock market by studying that patterns of abnormal returns of announcements made earlier. Srinivasan (2002) found extremely large positive abnormal returns on ex-bonus and ex-rights dates for equity stocks. Similar study by Budhraja I., Parekh P. and Singh T. (2004) on BSE suggests that abnormal returns in stock prices around the bonus announcement date over a three day trading period starting one day before the announcement date is significant at 95 % confidence limit. It also says that much of the information in the bonus announcement gets impounded into stocks by the time of announcement.

## 4. Methodology and Data

*Data and Sample*

Bonus stock issue announcement dates of Indian publicly listed companies for the period from June 1998 to August 2004 were collected using three data sources— Prowess, Capital online and NSE website. First, the Capital online were used to identify Indian public companies that made bonus issues to stockholders during the period covering June 1998 to August 2004. Second, the announcement dates for bonus issues were extracted from the news abstracts of prowess and Capital online and NSE website. This process revealed 46 observations that met the following criteria.

- The bonus announcement date is to be reported in any of the leading financial dailies- Economic Times, Business Line etc.
- The bonus issue had to be an issue of new ordinary fully paid securities (at no cost to stockholders) and not issued with a rights issue or bonus option issue.
- Daily closing stock price data for the company over the period from 250 days before to 30 days after the announcement dates are available from the databases.
- The bonus issue must not have been issued in part or whole as a consideration in a merger or acquisition or reconstruction.
- There should not be any cash dividend announcement along with the bonus announcement.

*Research Methodology*

Most research in this area concerns the market behavior prior to and after bonus issue announcement. Over the past half century, *standard event-study methodologies* have been employed in such researches.[1] Their sophistication has been greatly improved by papers such as Fama, Jensen, and Roll (1969), Brown and Warner (1980, 1985) and Dennis and McConnell (1986). This study in order to examine the impact of the announcement of a bonus issue on the stock return also uses the event study to estimate the normal return for a security.

[1] The impact of event on stock price is assessed through a number of firms which are affected by the event of interest. Event studies almost always involve analyses of stock returns of publicly traded firms. Conceptually, it might be possible to estimate the impact of an event on a private company if sufficient data were available.

In order to carry out an event study, the *event date*[1], *event window*[2], and *estimation window*[3] should be determined. Regression analysis is used to estimate the relationship between a firm's returns (dependant variable) and stock returns of a benchmark group such as a portfolio of similar firms, returns across an industry or some estimate of market returns.[4] The *event date* in this study is the date of announcement of bonus issues by the sample firms. The *event window* is taken as t = -20 to t = +20 relative to the *event day* t = 0 (date of announcement of bonus) and the return on the market portfolio is proxied by the NSE nifty. The *estimation window* is from t = -140 to t = -21 relative to the event day t = 0. Return on security j in period t is given by [5]

$$R_{j,t} = \text{In}\ (P_{jt}/P_{j,t-1}) \qquad (1)$$

The announcement effect on the stock price is measured by the standard *market model event-study methodology* (MacKinlay 1997).[6] The model assumes a linear relationship between the return of the security to the return of the of the market portfolio. Market model, developed by Sharpe (1963) and used by Fama *et al* (1969), is free from the criticism of Roll (1977). Brown & Warner (1980, 1985) have also shown that methodologies based on OLS market model are at least powerful in detecting abnormal returns as other more elaborate procedures. The impact on market price due to bonus announcement is estimated by the difference between the realized post-announcement period return and the return predicted by the market model.

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[1] The event date is supposed to be the date when the event occurs.

[2] Fama et al (1969) suggested that the defined event date may be uncertain. Therefore, one should also consider abnormal return which might appear before or after defined event date. This interval is called event window. In other words it is the period beginning immediately after the occurrence of the event and continuing out for some identified period of time.

[3] The estimation window is defined as the period prior to the occurrence of the event. It is typical for the estimation window and the event window not to overlap. This ensures that estimators for the parameters of the normal return model are not influenced by the event-related returns.

[4] This could be a market index such as the BSE or NSE or it might be represented by average returns over a designated industry portfolio.

[5] Arithmetic returns are often positively skewed due to their being in the range -1 to $+\infty$. A log transformation helps reduce their skewing and so improves the power of significance tests appropriate to normally distributed variables.

[6] Two other models, namely the market-adjusted and mean-adjusted models, are also used for measuring the market reaction. The test results are quantitatively and qualitatively similar to those reported in this paper. Additionally, none of the stocks in the sample has missing price data eliminating the non-trading problem in event studies.

*Abnormal Returns*

Ex-post abnormal returns are obtained as the difference between observed returns of firm *j* at event day *t* and the expected return generated by a particular benchmark model. Abnormal returns ($AR_{j,t}$ ) were computed for each security in the sample for each day during the event period-20 to +20. Market model abnormal return (*AR*) for the $j^{th}$ firm on day *t* is given by

$$AR_{j,t} = R_{j,t} - (\hat{\alpha}_j + \hat{\beta}_j * R_{m,t}) \quad (2)$$

where $\hat{\alpha}_j$ and $\hat{\beta}_j$ are the estimated coefficients

$$\hat{\alpha}_j = \bar{r}_j - \hat{\beta}_j . \bar{r}_m \quad (3)$$

$$\hat{\beta}_j = \text{Cov}(r_j, r_m) / \text{Var}(r_m) \quad (4)$$

The parameters $\hat{\alpha}_j, \hat{\beta}_j$ have been estimated from following OLS regression of the event firm's returns on the index returns during the estimation window for firm $j$[1]

$$R_{j,t} = \alpha_j + \beta_j R_{m,t} + \varepsilon_{j,t} \quad (5)$$

where

$R_{jt}$ - the rate of return of the stock *j* on the day *T*

$R_{mt}$ - the rate of return of the market index (*m*) on the day *T*

$e_{j\,t}$ - the error term of the stock *j* on the day *T*, having zero mean $\sigma^2\ \varepsilon_j$ variance. Under the assumption of joint normality and independently and identically distributed returns, the error of the regression is well–behaved, i.e.

$$E(\varepsilon_{j,t}) = 0 \text{ and } VAR(\varepsilon_{j,t}) = \sigma^2\ \varepsilon_j \quad (6)$$

1 This regression utilizes observed returns for a time period prior to the "event period" so as not to contaminate their estimation with the impact of the event under study.

*Aggregation of Abnormal Returns*

For being able to draw overall inference on the abnormal returns, the abnormal returns for the securities were summed up trading-day wise. Since the conditional abnormal returns for all N securities are assumed to be independent and normally distributed, the abnormal returns must be aggregated in order to draw overall inferences for the event of interest. The aggregation can be done crossing securities and through time, i.e., cross-sectional and time series aggregation. The cross-sectional aggregation crossing events are considered by using the abnormal return defined in equation 2 to get the average abnormal return. The average abnormal returns at time t for event period from τ1 to τ2 will be:

$$\overline{AR}_t = \frac{1}{N} * \sum_{j=1}^{N} AR_{jt} \tag{7}$$

where N is the number of firms in the sample, t is defined in trading days relative to the event day (e.g. t - 20 means 20 trading days before the event) and $\overline{AR}_t$ denote the average of the abnormal return crossing events.

The average abnormal returns and variance in average abnormal returns across all N securities in a given time period are computed as follows:

$$\hat{\sigma}^2(\overline{AR}_t) = \sigma^2_{\bar{e}^2} = \frac{1}{N^2}\sum_{j=1}^{N}\hat{\sigma}^2_{ej} \tag{8}$$

Therefore, using these estimates, the abnormal return for any date in the event window can be analyzed.

*Test Statistics*

In order to obtain robust results different test statistics needs to be applied. Firstly, the traditional t statistics for each daily return $AAR_t$ have been computed. Additionally other test statistics examined are the Patell (1976) standardized residual test studied by Brown

and Warner (1985), the standardized cross-sectional test introduced by Boehmer, Musumeci and Poulsen (1991), and the generalized sign test analyzed by Cowan (1992). The null hypothesis for each test is that the mean abnormal return is equal to zero.

Following Patell (1976), the abnormal return for each security has been standardized by dividing by the security's own estimate of variance to test the hypothesis that the average announcement effect is equal to zero.[1]

$$SAR_{jt} = \frac{\mathrm{AR}_{\mathrm{jt}}}{\sigma_{\varepsilon j}} \sim \mathrm{t}\left(\mathrm{k}_1 - 2\right) \tag{9}$$

where $SAR_{jt}$ is the maximum likelihood estimate of the variance of $AR_{j,t}$ and

$$\sigma_{\varepsilon j} = \sqrt{\frac{\sum_{t=1}^{k}\left(AR_t\right)^2}{k}} * \sqrt{1+\frac{1}{k}+\frac{\left(R_{m,t}-\overline{R_m}\right)^2}{\sum_{t=1}^{k}\left(R_{m,t}-\overline{R_m}\right)^2}} \tag{10}$$

where $R_{m,t}$ and $R_m$ are the return and mean return on the market during the k-day estimation period. Under the null hypothesis, each SARjt follows a Student's t distribution with $K_1-2$ degrees of freedom.

To construct a test statistic of abnormal returns across the N firms in period t, standardized abnormal returns ($SAR_{jt}$) have been summed across the sample to obtain the total standardized abnormal return ($TSAR_t$).

$$TSAR_t = \sum_{j=1}^{N} SAR_{jt} \tag{11}$$

The expected value of $TSAR_t$ is zero. The variance of $TSAR_t$ is given as follows:

[1] Hence the standardized abnormal returns are approximately unit normally distributed assuming the abnormal returns are normal and independent through time. Further, this standardization process helps ensure that no single firm in the sample dominates the results of the analysis and helps improve the power of the test statistics.

$$Q_t = \sum_{j=1}^{N} \frac{K_j - 2}{K_j - 4} \tag{12}$$

The Patell test standardizes the event-date prediction error for each stock by its standard deviation. Patell's method allows the variation in the market during the estimation period to differ from the event period and adjusts for the number of observations in the estimation interval. The individual prediction errors are assumed to be cross-sectionally independent and distributed normally, so each standardized prediction error has a student *t* distribution. By the Central Limit Theorem, the distribution of the sample average standardized prediction error is normal. The resulting test statistic is

$$Z_t = \frac{TSAR_t}{\sqrt{\sum_{j=1}^{N} \frac{K_j - 2}{K_j - 4}}} \tag{13}$$

where

$Z_t$ = Z- statistics for each day in the event window

$TSAR_t$ = Total standardized abnormal return for each day in the event window

$K_j$ = Number of observed trading day returns for firm j over the estimation period.

N = number of firms in the sample

Brown and Warner (1980, 1985) show that when a certain event has an effect that is not identical across firms, the variance of returns will be higher than it was pre-event and common statistical testing methods used with market model abnormal returns may not be appropriate. The Patell test in such case will reject the null hypothesis more often than the nominal significance level. In order to solve this problem Boehmer, Musumeci, and Poulsen (1991) proposed the standardized cross-sectional method to calculate test statistic when risk increases after event. The testing procedure is robust under conditions of event-induced variance. The standardized cross-sectional test is the result of combining the standardized-residual technology developed by Patell (1976) and the ordinary cross-sectional methodology proposed by Charest (1978) and Penman (1982). However, it use cross sectional standard error estimated during event window to divide standardized

abnormal return whereas Patell (1976) used standard deviation during estimation period. When the observation during estimation period, $T_i$, is large enough, both test statistics will distribute as *student-t*. The test statistic has the following form:

$$Z = \frac{1}{N}\sum_{j=1}^{N} SAR_{j,t} \Bigg/ \sqrt{\frac{1}{N(N-1)}\sum_{j=1}^{N}(SAR_{j,t} - \sum_{i=1}^{N}\frac{SAR_{j,t}}{N})^2} \qquad (14)$$

where N is the number of firms used in the calculation.

Boehmer, Musumeci and Poulsen (1991) report that the test is correctly specified in NYSE-AMEX samples under the null hypothesis even when there is a variance increase on the event date. Moreover, unlike other prevalent tests, the standardized cross-sectional test is nearly as powerful as the Patell test when there is no variance increase.

A nonparametric test is normally used in conjunction with the parametric test in event study to verify that the results of parametric tests are not driven by outliers. In this study, Cowan's (1992) nonparametric generalized sign test is employed. This test is like the traditional sign test. However, the sign test requires the assumption that the number of stocks in a sample of size *n* that have positive returns on the event date follows a binomial distribution with parameter *p*. The null hypothesis for the traditional sign test is that $p$=0.5. In the generalized sign test, the null hypothesis does not specify *p* as 0.5, but as the fraction of positive returns computed across stocks and across days in the parameter estimation period. This test is also well-specified when the variance of stock returns increases around event day.

The test examines whether the number of stocks with positive abnormal returns in the event window exceeds the number expected in the absence of abnormal performance. The number expected is based on the fraction of positive abnormal returns in the estimation period. Thus the fraction of positive abnormal returns expected under the null hypothesis is

$$\hat{p} = \frac{1}{\mathrm{N}} \sum_{j=1}^{n} \frac{1}{K_j} \sum_{t} S_{jt} \tag{15}$$

where $S_{jt}$ is 1 if $\varepsilon_{j,t} > 0$, 0 otherwise; and the generalized sign test statistic is

$$Z = (w - n\hat{p}) / [n\hat{p}(1 - \hat{p})]^{1/2} \tag{16}$$

Cowan (1992) reports that the test is well specified and powerful under a variety of conditions. Like the standardized cross-sectional test, it is relatively robust to variance increases on the event date.

1. Sample Selection
2. General Simulation Samples

*Cumulative Abnormal Return*

Specifically, c*umulative abnormal returns* (CAR) summed throughout the event period, can be tested to determine if they are statistically different from zero.[1] Through the use of CAR it is possible to track abnormal returns occurring over a number of trading days. Since outcomes of many events are not immediately known, the CAR allows for consideration of abnormal returns over a predefined period of time. By considering abnormal returns that coincide with an event it is possible to establish the impact on CARs over several days and to capture the impact of an event as it unfolds over time. The accumulated impact of event from $T_1$ to $T_2$ can be assessed by cumulative abnormal return (CAR) for firm j over period $t_1$ to period $t_2$ as shown in

$$CAR_{j,t_1,t2} = \sum_{t-t_1}^{t_2} AR_{jt} \tag{17}$$

Secondly, the average abnormal returns have been aggregated over the event period as defined to get the average Cumulative Abnormal Return $\overline{CAR}$ . Over an interval of two or

[1] *See*, Campbell, John, Y., Andrew W. Lo, and A. Craig MacKinlay, .The Econometrics of Financial Markets,. 1997, p. 160.

more trading days beginning with day T1, and ending with T2, the cumulative average abnormal return ($\overline{CAR}_{T1,T2}$) and its variance is given as under:

$$\overline{CAR}\ (\tau_1.\tau_2) = \frac{1}{N}\sum_{j=1}^{N}\overline{AR}(\tau_1.\tau_2) \tag{18}$$

$$Var\left[\overline{CAR}(\tau_1.\tau_2)\right] = \frac{1}{N^2}\sum_{j=1}^{N}\hat{\sigma}_j^2\ (\tau_1.\tau_2) \tag{19}$$

Under a set of conditions (see Patell, 1976), the test statistic for the hypothesis ($CAAR_{T1,T2}=0$) , follows (under the null hypothesis) a standard normal distribution. However, the standardized cross-sectional test proposed by Mikkelson and Partch (1988) has also been computed. This test corrects the test of Patell (1976), and adjusts the CAAR for the possible serial correlation of the abnormal returns of each stock within event window. As Cowan (1993) points out, serial correlation may be an important factor for long windows (i.e., windows of 100 days' length). This statistics also follows a standard normal distribution. The standardized cumulative abnormal return ($SCAR_{j,t1,t2}$ ) for any one security over the period ($T_1$, $T_2$)is defined as its Cumulative Abnormal Return (CAR) divided by its corresponding standard deviation.

$$SCAR_{j,t_1,t_2} = \frac{\mathrm{CAR}_{j,t_1,t_2}}{SD_{CAR_{j,t1},t_2}} \tag{20}$$

and

$$SD_{CAR_i,t_1,t_2}\sqrt{\frac{\sum_{t=1}^{k}\mathrm{AR}_{i,t^2}}{k-2}}\left\{L\left[1+\frac{L}{k}+\frac{\left(\sum_{t=t_1}^{t_2}R_{M,t}-L\overline{R}_M\right)^2}{\sum_{t=1}^{k}\left(R_{M,t}-\overline{R}_M\right)^2}\right]\right\} \tag{21}$$

and L equals the length of the event window in days, i.e., $L = t_2 + t_1 + 1$.

Finally, these standardized cumulative abnormal returns are averaged across all N securities and divided by an estimate of the standard deviation of standardized cumulative abnormal returns to obtain a test statistic for the standardized cumulative average abnormal returns for the sample. This modified Z-statistic for testing the null hypothesis $H_O$ : $SCAR_{t1,t2} = 0$ is presented in equation (22).

$$Z_t = \frac{\sum_{j=1}^{N} \mathrm{SCAR}_j(\tau_1, \tau_2)}{\sigma_{scar}\sqrt{N}} \tag{22}$$

where

$$\hat{\sigma}^2_{scar}(\upsilon_1, \tau_2) = \frac{1}{N-1}\sum_{j=1}^{N}\left[SCAR(\tau_1, \tau_2) - \frac{1}{N}SCAR(\tau_1, \tau_2)\right]^2 \tag{24}$$

*Testable hypotheses*

H1. The null hypothesis being tested is that abnormal returns on and around bonus issue are less than or equal to zero. If $AAR_t$, $CAAR_{T1,T2}$ >0 and statistically significant, it indicates that the stock prices on an average reacted positively to the bonus issues and thus increased the wealth of the stockholders.

**5. Results**

Table 1 shows the beta (i.e. sensitivity) of the sample stocks under consideration with respect to NSE Index). The $R^2$ of the regressions of daily returns of the stock on the daily returns on indices are also provided for the period. Beta coefficients are highly significant for 29 companies in a sample of 46, indicating that risk is an important determinant of company's return.

| Table 1 : Impact of Bonus Issue on Share Price Performance | | | | | | | |
|---|---|---|---|---|---|---|---|
| Company Name | Event Date | Alpha | Beta | Mean Returns | $R^2$ | Mkt Model Residual | T-Stat |
| Alembic Ltd. | 12/02/2004 | 0.00339 | 0.38506 | 0.0051 | 0.01 | 35.00% | 1.21 |
| Amtek Auto Ltd. | 05/08/2002 | -0.00074 | 0.05834 | -0.0007 | 0.01 | 54.17% | 0.88 |
| Asian Paints (India) Ltd. | 29/05/2003 | -0.00009 | 0.07124 | -0.0001 | 0.01 | 50.00% | 0.79 |
| Aurobindo Pharma Ltd. | 30/06/1998 | 0.00852 | 0.03369 | 0.0085 | 0.00 | 49.17% | 0.12 |
| Berger Paints India Ltd. | 04/02/2004 | 0.00501 | 0.06167 | 0.0053 | 0.00 | 45.83% | 0.18 |
| Blue Dart Express Ltd. | 08/05/2001 | -0.00269 | 0.62779 | -0.0029 | 0.12 | 51.67% | 4.00 ** |
| Bharat Petroleum Corpn. Ltd. | 28/09/2000 | -0.00410 | 0.06343 | -0.0042 | 0.00 | 55.83% | 0.35 |
| Cadbury India Ltd. | 03/03/2000 | -0.00180 | 0.41649 | -0.0011 | 0.11 | 49.17% | 3.85 ** |
| Cosmo Films Ltd. | 16/01/2003 | 0.00028 | -0.04333 | 0.0003 | 0.00 | 44.17% | -0.15 |
| Essel Propack Ltd. | 21/07/2000 | -0.00570 | 1.01747 | -0.0057 | 0.25 | 48.33% | 6.30 ** |
| F D C Ltd. | 24/02/2000 | 0.00088 | -0.00445 | 0.0009 | 0.00 | 43.33% | -0.02 |
| Federal Bank Ltd. | 07/06/2004 | 0.00482 | 1.28188 | 0.0062 | 0.30 | 45.83% | 7.09 ** |
| Geometric Software Solutions Co. Ltd. | 27/04/2004 | -0.00014 | 1.28503 | 0.0017 | 0.37 | 42.50% | 8.29 ** |
| Goodlass Nerolac Paints Ltd. | 30/04/2004 | 0.00127 | 0.06725 | 0.0014 | 0.00 | 42.50% | 0.59 |
| Housing Development Finance Corpn. Ltd. | 17/10/2002 | -0.00070 | 0.19579 | -0.0009 | 0.02 | 53.33% | 1.44 |
| Hindustan Lever Ltd. | 21/05/2002 | 0.00117 | -0.32841 | 0.0018 | 0.02 | 43.33% | -1.57 |
| Industrial Development Bank Of India | 19/12/2000 | 0.00047 | 0.47085 | 0.0001 | 0.10 | 40.00% | 3.68 ** |
| Infosys Technologies Ltd. | 13/04/2004 | -0.00101 | 0.90600 | 0.0011 | 0.49 | 45.83% | 10.54 ** |
| Infotech Enterprises Ltd. | 25/02/2002 | 0.01257 | 2.31844 | 0.0127 | 0.27 | 43.33% | 6.58 ** |
| Indian Oil Corpn. Ltd. | 17/06/1999 | -0.00358 | 0.67361 | -0.0015 | 0.18 | 52.50% | 5.01 ** |
| Karur Vysya Bank Ltd. | 01/04/2002 | 0.00279 | 0.05394 | 0.0028 | 0.00 | 39.17% | 0.26 |
| Karnataka Bank Ltd. | 23/08/2002 | 0.00199 | 0.27118 | 0.0018 | 0.01 | 40.83% | 0.82 |
| Kochi Refineries Ltd. | 14/08/2000 | -0.00342 | 0.44470 | -0.0038 | 0.12 | 46.67% | 3.99 ** |
| Kotak Mahindra Bank Ltd. | 25/05/2004 | 0.00020 | 0.41159 | 0.0006 | 0.09 | 45.00% | 3.34 ** |
| L G Balakrishnan & Bros. Ltd. | 22/10/2003 | 0.01037 | -0.43721 | 0.0093 | 0.03 | 43.33% | -1.89 |
| Marico Industries Ltd. | 15/03/2004 | 0.00008 | 0.59633 | 0.0019 | 0.14 | 43.33% | 4.33 ** |
| Micro Inks Ltd. | 26/07/2000 | -0.00032 | 0.48076 | -0.0008 | 0.09 | 50.00% | 3.34 ** |
| Mid-Day Multimedia Ltd. | 11/05/2004 | 0.00098 | 1.18528 | 0.0029 | 0.12 | 45.83% | 3.97 ** |
| Monsanto India Ltd. | 22/05/2001 | -0.00111 | 0.42964 | -0.0012 | 0.06 | 51.67% | 2.77 ** |
| Moser Baer India Ltd. | 22/09/2003 | 0.00024 | 0.85790 | 0.0016 | 0.09 | 55.00% | 3.43 ** |
| Mphasis B F L Ltd. | 08/04/2004 | 0.00181 | 0.54052 | 0.0032 | 0.14 | 47.50% | 4.39 ** |
| Nucleus Software Exports Ltd. | 27/04/2004 | -0.00287 | 1.36778 | -0.0010 | 0.27 | 49.17% | 6.53 ** |
| Pentamedia Graphics Ltd. | 25/04/2002 | 0.00060 | 3.14783 | 0.0061 | 0.43 | 51.67% | 9.52 ** |
| Pfizer Ltd. | 13/03/2000 | -0.00132 | 0.64824 | -0.0001 | 0.14 | 43.33% | 4.35 ** |
| Polaris Software Lab Ltd. | 20/04/2001 | -0.00597 | 2.22582 | -0.0069 | 0.42 | 47.50% | 9.27 ** |
| Ranbaxy Laboratories Ltd. | 18/07/2002 | 0.00190 | 0.87600 | 0.0020 | 0.22 | 49.17% | 5.80 ** |
| Sun Pharmaceutical Inds. Ltd. | 22/04/2004 | 0.00108 | 0.38456 | 0.0016 | 0.07 | 50.00% | 2.96 ** |
| Thermax Ltd. | 29/05/2003 | 0.00055 | 0.31051 | 0.0005 | 0.03 | 46.67% | 1.88 |
| Thomas Cook (India) Ltd. | 18/02/2000 | -0.00220 | 0.09099 | -0.0020 | 0.00 | 41.67% | 0.74 |
| Tata Iron & Steel Co. Ltd. | 07/06/2004 | -0.00216 | 1.53471 | -0.0005 | 0.71 | 50.00% | 17.00 ** |
| Tube Investments Of India Ltd. | 10/06/2004 | 0.00168 | 0.30096 | 0.0019 | 0.03 | 50.83% | 1.83 |
| Ucal Fuel Systems Ltd. | 19/07/2004 | -0.00217 | 0.86850 | -0.0039 | 0.43 | 50.83% | 9.53 ** |
| V L S Finance Ltd. | 01/02/2000 | 0.01176 | 0.77569 | 0.0129 | 0.04 | 49.17% | 2.21 ** |
| Videsh Sanchar Nigam Ltd. | 25/08/2000 | -0.00719 | 0.64828 | -0.0081 | 0.06 | 46.67% | 2.72 ** |
| Wipro Ltd. | 16/04/2004 | -0.00066 | 1.17408 | 0.0018 | 0.52 | 48.33% | 11.40 ** |
| Zandu Pharmaceutical Works Ltd. | 12/08/2004 | 0.00004 | 0.19360 | -0.0002 | 0.04 | 53.33% | 2.08 ** |
| Mean | | 0.00053 | 0.62913 | 0.00110 | 0.14 | 47.23% | |
| Median | | 0.00014 | 0.45778 | 0.00075 | 0.09 | 47.50% | |
| Note: The symbols ** denote statistical significance at the 0.5% level. | | | | | | | |

Table 2 presents the results of the entire sample consisting of 46 bonus issues. For each of the forty-one days in the experimental period it reports the average daily abnormal returns (AARs), median daily abnormal returns (MARs) for days $t_{-20}$ to $t_{+20}$ along with summary statistics for tests of the null hypothesis. The first column in the Table gives the event day while the second gives the average abnormal return on that event day. The t-statistic values corresponding to the average abnormal returns are given in the sixth column.

The table indicates that for the 20 days before the announcement date there is no consistent pattern of abnormal returns of companies engaging in bonus issue. The AARs before the announcement period (-20 to -1 day) are positive only for fourteen days out of twenty days and are negative for six days. On day $t_{-20}$ the AARs are negative and significant at 1%. However, the null of zero AAR is rejected on days ($t_{-9}$), ($t_{-8}$), ($t_{-6}$); abnormal returns on these days are positive at a 1 percent level of significance as per traditional t-test, standard Patell Z score, variance adjusted Z score , and the generalized sign Z-statistics. The hypothesis is further rejected on day $t_{-3}$ and $t_{-2}$ as per standard Patell Z score. This might be due to leakage of the board of directors' decision to propose the bonus issue or insiders' trading activities. However, no theory can be offered on why leakage should occur on these specific dates. On other days before the announcement date there are no significant abnormal returns for the stockholders of the sample companies. The evidence suggests that a negative median abnormal return, (–0.63%), occurs 1 day before the bonus announcement day. On this day, for 18 companies (39.13%) abnormal returns are positive. In existence of the sign effect on stock returns, on average, the firms experienced negative abnormal return on the announcement day ($t_0$= -0.19 %) as well as the following day ($t_{+1}$ = -0.16 %). This indicates that the market had already anticipated the announcement of bonus issue and had reacted much earlier than on the day of the announcement.

The days after the announcement date show no consistent pattern of the average abnormal returns. After the announcement day, average abnormal returns are negative for ten days. All AARs after the announcement day are statistically insignificant at any conventional level by applying traditional t statistics. When these values are standardized it is found that only the return for day $t_{+18}$, is 0.72% and is significant at 1% level. The

AARs are negative and significant on day $t_{+4}$ and $t_9$ as per standard Patell Z score and positive and significant as per generalized sign test on day $t_{+20.}$

Most of the pre-event windows have positive CAAR and is significant on day $t_{-+9,}$ $t_{-+8}$and $t_{-+6}$, which implies that there was substantial leakage of information before the event. The CAAR figures show that to some extent the market gradually learns (information leaks out) about the forthcoming announcement. The average CAAR of the sample firms gradually drifts up in days –20 to –1. The buildup of abnormal returns prior to announcement is consistent with the semi strong-form of market efficient hypothesis i.e. if information related to the event leaks out prior to the announcement, the CAAR will gradually increase in the days prior to the announcement and then decreases on the day of the announcement, reflecting the responses of those stocks for which information did not leak out. The CAAR starts picking up on day $t_{-8}$. During the period covering $t_{-8}$ to $t_{-2}$, CAAR increases from 4.28% to 8.54%. A clear jump at the CAAR from 8.54% to 9.33% can be observed at the one business day before *announcement*.

However, during the period under consideration, investors initially appear to respond positively to the announcement of bonus offerings, but the CAARs show a declining trend shortly thereafter. After the announcement slight decline to 9.14% can be observed on $t_0$. The CAAR of 8.81 percent on $t_{+3}$ declines to 6.92 percent by $t_{+20}$, indicating that the market actually corrects the prices downward after an initial period of trading around the event days (between $t_{+1}$ and $t_{+20}$ negative CAAR of -2.06% is observed).

Similar to Liu, Smith and Syed (1990), Beneish (1991) and Kiymaz (1999), one cannot exclude the possibility of the insider trading during the short time period between the period prior and after the *bonus announcement*. However this paper is not in a position to make such a claim either.

| Table 2: Daily Average Abnormal Returns and Test Statitics for the Entire Sample (N=46) as per Market Model | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Day | N | AAR (%) | MAR (%) | Pos: Neg | t - stat | Z Score | | | CAAR | t - stat |
| | | | | | | Standard Patell | Variace Adjusted | Gen Sign | | |
| -20 | 46 | -0.93% | -0.77% | 16 : 30 | -2.06 *** | -1.08 | -0.74 | -1.69 *** | -0.93% | -2.06 *** |
| -19 | 46 | -0.26% | -0.49% | 20 : 26 | -0.45 | -0.14 | -0.10 | -0.51 | -1.19% | -1.62 |
| -18 | 46 | 0.44% | -0.16% | 22 : 24 | 0.85 | 0.82 | 0.77 | 0.08 | -0.75% | -0.84 |
| -17 | 46 | -0.04% | -0.17% | 21 : 25 | -0.07 | 0.96 | 0.81 | -0.21 | -0.79% | -0.75 |
| -16 | 46 | -0.62% | -0.71% | 19 : 27 | -1.19 | -0.27 | -0.22 | -0.80 | -1.41% | -1.20 |
| -15 | 46 | 0.38% | 0.14% | 25 : 21 | 0.89 | 0.65 | 0.71 | 0.97 | -1.04% | -0.83 |
| -14 | 46 | -0.27% | -0.08% | 23 : 23 | -0.47 | -0.22 | -0.18 | 0.38 | -1.31% | -0.95 |
| -13 | 46 | 0.28% | 0.08% | 24 : 22 | 0.57 | 0.94 | 0.86 | 0.67 | -1.03% | -0.71 |
| -12 | 46 | 0.14% | -0.22% | 20 : 26 | 0.28 | 0.51 | 0.44 | -0.51 | -0.89% | -0.58 |
| -11 | 46 | 0.73% | 0.40% | 27 : 19 | 1.32 | 1.26 | 1.00 | 1.56 | -0.16% | -0.10 |
| -10 | 46 | 0.56% | 0.44% | 26 : 20 | 1.19 | 1.80 *** | 1.20 | 1.26 | 0.40% | 0.23 |
| -9 | 46 | 1.51% | 0.59% | 30 : 16 | 2.48 *** | 3.12 *** | 2.57 *** | 2.44 *** | 1.90% | 1.05 |
| -8 | 46 | 2.34% | 0.96% | 27 : 19 | 3.19 *** | 5.02 *** | 2.69 *** | 1.56 | 4.24% | 2.17 *** |
| -7 | 46 | 0.81% | 0.12% | 23 : 23 | 1.16 | 1.47 | 0.95 | 0.38 | 5.06% | 2.43 *** |
| -6 | 46 | 1.42% | 0.58% | 31 : 15 | 1.98 *** | 4.20 *** | 2.61 *** | 2.74 *** | 6.48% | 2.95 *** |
| -5 | 46 | 0.39% | -0.12% | 22 : 24 | 0.54 | 1.36 | 0.97 | 0.08 | 6.86% | 2.97 *** |
| -4 | 46 | -0.03% | 0.42% | 25 : 21 | -0.06 | -0.01 | -0.01 | 0.97 | 6.83% | 2.89 *** |
| -3 | 46 | 0.89% | -0.02% | 23 : 23 | 1.43 | 1.68 *** | 1.15 | 0.38 | 7.72% | 3.16 *** |
| -2 | 46 | 0.82% | 0.14% | 26 : 20 | 1.39 | 1.76 *** | 1.31 | 1.26 | 8.54% | 3.39 *** |
| -1 | 46 | 0.79% | -0.63% | 18 : 28 | 0.99 | 1.15 | 0.69 | -1.10 | 9.33% | 3.53 *** |
| 0 | 46 | -0.19% | -0.10% | 19 : 27 | -0.35 | -0.03 | -0.02 | -0.80 | 9.14% | 3.39 *** |
| 1 | 46 | -0.16% | -0.15% | 21 : 25 | -0.36 | -0.86 | -0.97 | -0.21 | 8.98% | 3.29 *** |
| 2 | 46 | -0.01% | 0.08% | 23 : 23 | -0.03 | 0.19 | 0.25 | 0.38 | 8.97% | 3.25 *** |
| 3 | 46 | -0.16% | 0.23% | 24 : 22 | -0.45 | 0.19 | 0.23 | 0.67 | 8.81% | 3.17 *** |
| 4 | 46 | -2.99% | -0.72% | 18 : 28 | -1.18 | -4.23 *** | -1.20 | -1.10 | 5.82% | 1.55 |
| 5 | 46 | -0.10% | -0.29% | 21 : 25 | -0.27 | 0.07 | 0.08 | -0.21 | 5.72% | 1.51 |
| 6 | 46 | -0.25% | -0.33% | 20 : 26 | -0.57 | 0.12 | 0.13 | -0.51 | 5.47% | 1.44 |
| 7 | 46 | -0.29% | -0.20% | 21 : 25 | -0.56 | -1.57 | -1.55 | -0.21 | 5.18% | 1.35 |
| 8 | 46 | 0.33% | 0.06% | 24 : 22 | 0.72 | 0.53 | 0.54 | 0.67 | 5.50% | 1.42 |
| 9 | 46 | -1.41% | 0.21% | 25 : 21 | -0.99 | -2.17 *** | -1.06 | 0.97 | 4.09% | 0.99 |
| 10 | 46 | 0.46% | 0.24% | 26 : 20 | 1.21 | 1.20 | 1.39 | 1.26 | 4.55% | 1.10 |
| 11 | 46 | -0.39% | -0.29% | 18 : 28 | -1.30 | -0.60 | -0.89 | -1.10 | 4.16% | 1.00 |
| 12 | 46 | 0.06% | -0.05% | 22 : 24 | 0.16 | 0.56 | 0.70 | 0.08 | 4.22% | 1.01 |
| 13 | 46 | 0.27% | 0.30% | 25 : 21 | 0.56 | 0.96 | 0.87 | 0.97 | 4.49% | 1.07 |
| 14 | 46 | -0.14% | -0.06% | 21 : 25 | -0.42 | 0.09 | 0.13 | -0.21 | 4.35% | 1.03 |
| 15 | 46 | 0.20% | 0.04% | 26 : 20 | 0.65 | 0.81 | 1.20 | 1.26 | 4.56% | 1.08 |
| 16 | 46 | 0.29% | 0.04% | 24 : 22 | 0.89 | 1.03 | 1.34 | 0.67 | 4.84% | 1.14 |
| 17 | 46 | 0.23% | 0.40% | 27 : 19 | 0.57 | 0.47 | 0.61 | 1.56 | 5.07% | 1.19 |
| 18 | 46 | 0.72% | 0.14% | 25 : 21 | 1.43 | 1.54 | 1.71 *** | 0.97 | 5.79% | 1.35 |
| 19 | 46 | 0.56% | 0.25% | 26 : 20 | 1.25 | 1.47 | 1.27 | 1.26 | 6.35% | 1.48 |
| 20 | 46 | 0.57% | 0.44% | 28 : 18 | 1.46 | 0.83 | 0.98 | 1.85 *** | 6.92% | 1.60 |
| AAR = Average Abnormal Return; MAR = Median Abnormal Return | | | | | | | | | | |
| Note: The symbols *** denote statistical significance at the 0.1% level. | | | | | | | | | | |

| Table 3 Cumulative Average Abnormal Return (CAAR) Across Event Window Market Model | | | | | |
|---|---|---|---|---|---|
| Days | N | Mean SCAR | Standard Patell Z Score | Variance Adjusted Z Score | Generalized Sign Z |
| t-20 to t-1 | 46 | 0.754312866 | 5.07 *** | 4.70 *** | 3.92 *** |
| t0 to t+1 | 46 | -0.0982875 | -0.66 | -0.60 | -1.69 *** |
| t-1 to t+1 | 46 | 0.018862495 | 0.13 | 0.08 | -0.51 |
| t+2 to t+20 | 46 | 0.050439793 | 0.34 | 0.27 | 0.67 |
| t-20 to t+20 | 46 | 0.507636943 | 3.41 *** | 2.68 *** | 3.33 *** |
| Note: The symbols *** denote statistical significance at the 0.1% level. | | | | | |

Table 3 presents the cross-sectional average of Standardized Cumulative Abnormal Returns (SCAR) for different event windows of (-20, -1), (0, +1), (-1, +1), and (+2, +20), surrounding the event days. In the table, in fact, the cumulated sum of abnormal returns for each firm is standardized for a variance estimate, which corrects for the eventual correlation between abnormal returns over the multiple-day window considered. For each event window, the table reports the mean standardized cumulative abnormal returns (SCAR), standard Patell Z score, variance adjusted Z score, and the generalized sign Z-statistic.

The MSCAR for trading day (+2, 20) is not statistically different from zero. The MSCAR of -0.098 during the two-day event period ($t_0$ to $t_{+1}$) is statistically significant as per generalized sign Z. It thus took 2 days for the market to correct the speculation that had built up prior to the announcement. The market is thus semi-efficient, with prices fully reflecting the public announcement available. Further, the market correction, signified by significant negative returns in the trading period of (0, 1), corroborates the argument for speculative trading put forth above.

The pre-event MSCAR ($t_{-20}$ to $t_{-1}$) of 0.7543 and the full test period CAR ($t_{-20}$ to $t_{+20}$) of 0.507, however, are statistically significant price changes as indicated by their high t-values. In fact, looking at Table, the highest and most significant values are observed over the windows (-20, -1). This is significant at a 1 percent level according to the standard Patell Z score, variance adjusted Z score and generalized sign Z. Based on these findings, the null hypothesis of zero abnormal returns cannot be accepted. Thus, it can be concluded that the event "bonus issue" has a positive and significant effect on returns around the announcement date. The study finds that there is a gradual leakage in information in the periods up to the public announcement date, with slow increase in CAR. It could thus be said that gradual leakage in information in the

market resulted in speculative trading in select scrips leading to their hike up in prices before the official announcement date. The gains in the scrip prices at the announcement date were thus lower. One major result is that the post-event ($t_{+2}$ to $t_{+20}$) drift of 0.0504 is not statistically significant, a result in conformity to efficient market conditions.

## 6. Conclusions

This study documents the market behavior around the bonus announcement date for 46 stocks listed on the National Stock Exchange of India over the period 1998 to 2004. An event study was conducted using a 180-day event window. It was found that on an average, the stocks start showing positive abnormal returns nine to eight days before the announcement date. This may be due to leakage of information. The CAAR for all these days are also significant. On the announcement day there was an excess return of -0.10%. The AARs for the first four days post announcement were negative but statistically significant on the fourth day. In general, the behavior of AARs and CAARs is found to be in accordance with expectation, thereby lending support to the hypothesis that the Indian stock market is. semi-strong efficient. Overall, then, evidence presented in this paper lends considerable support for the signaling hypothesis consistent with the findings in the United States, Sweden, Canada, and New Zealand.

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