Stock Price Reactions to Earnings Announcements in Indian Stock Market

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Executive Summary

The efficient market hypothesis (EMH) concept has been debated since 1950's by academicians and professionals and even today it is an important part of modern finance. The capital market efficiency is classified into allocative efficiency, operational efficiency and informational efficiency. The EMH deals with informational efficiency which states that participants cannot outperform the market with new informational flow. Many researchers investigated the stock market reaction to informational disclosure by considering various corporate announcements such as stock split, mergers and acquisition, dividend announcement etc. Stock price response to earnings announcements has received considerable attention as earnings are considered as the firms' performance indicator. The investors' expectation on the extent of excess return that they would make from trading in the stock market is based on several factors and one of them is quarterly earnings announcement news. In this study, we focus on examining the stock price reactions to earnings announcements in Indian stock market using a sample of firms listed on the BSE (Bombay Stock Exchange Limited). We use event study methodology to examine the significant relationship between stock returns and quarterly earnings announcement. The BSE-500 based companies are selected as sample companies as they diversified and well traded stocks. The whole sample is subdivided in to good sample portfolio, bad sample portfolio and full sample portfolio based on percentage change in the net profit and net sales of current and corresponding quarters. We use t test (Brown & Warner, 1985) for statistical significance and Runs and Sign test for testing the hypotheses. Cohen et al. (1983 a) methodology is also used to see the price adjustment process during the quarterly earnings announcement.

The empirical results show that, AAR and CAAR values are positive than negative values for majority of days during the event window. This result shows that market has positively reacted on the release of the September 2012 quarterly earnings announcement. We tested the randomness in the behavior of AAR values using Runs test and found that the observed excess return series are not random during the event window of 61 days for mean adjusted model and market model. The sign statistics shows significant values for overall period for all models and for all the portfolios except for bad news of market adjusted portfolio. Therefore, we conclude that there is a significant difference between the number of positive and negative AAR. The t test results of the study show that AARs and CAARs values are significant for majority of the days in the event window of 61 days. Therefore, we reject the hypothesis that AAR and CAAR values are close to zero. The exception to this conclusion seems to be the bad news portfolio as their values are insignificant for the market adjusted model. The result from Cohen et al. (1983 a) methodology shows the proportionate decrease in beta. The R^2 values are also decreased proportionately during the post event period and this shows poor price efficiency. The BETA2 are negatively signed in the post event period. Based on overall results, we conclude that Indian stock market is inefficient in semi-strong form and there is a scope for abnormal profits for the investors since the market fail to incorporate the new information in security prices. The quarterly earning information can generate significant abnormal profits to the trades in Indian stock market.

We examine Efficient Market Hypothesis theory (EMH) which states that an investor cannot beat the market based on any set of information whether it is historical, publically available information or private information. The investors' expectation on the extent of excess return that they would make from trading in the stock market is based on several factors and one of them is quarterly earnings announcement news. We examine whether there is any significant relationship between stock returns and quarterly earnings announcement. For this purpose, we employ event study methodology. We use 61 days event window, 30 days (-1 to -30) before the announcement and 30 days (1 to 30) after the announcement and 0^{th} day, the announcement day. The mean adjusted model, market adjusted model and market model are used to measure the abnormal performance. The whole sample is subdivided in to good sample portfolio, bad sample portfolio and full sample portfolio based on percentage change in the net profit and net sales of current and corresponding quarters. We use t test (Brown & Warner, 1985) for statistical significance and Runs and Sign test for testing the hypotheses. Cohen et al. (1983 a) methodology is also used to see the price adjustment process during the quarterly earnings announcement. We focus on the daily closing prices of BSE-500 index (Bombay Stock Exchange) based companies as a sample and September 2012quarterly announcements results as an event. The results show that Cumulative Average Abnormal Returns (CAARs) are statistically significant for most of the days in the event window. The findings of the study support the prediction that quarterly earnings information contains information value which is not reflected in security prices and therefore, traders can outperform the market based on quarterly earnings announcements in Indian stock market.

Key words: Efficient Market Hypothesis theory (EMH), excess return, Cumulative Average Abnormal Returns (CAARs), quarterly earnings announcements, Indian stock market.

1. Introduction

The concept of stock market efficiency has been investigated since 1950s and it has been regarded as one of the important areas of research in modern finance. The development of Efficient Market Hypothesis (EMH) (Fama 1965, 1970) has created the interest among the researchers to examine its validity. Many researchers investigated the stock market reaction to informational disclosure by considering various corporate announcements such as stock split, mergers and acquisition, dividend announcement etc. Stock price response to earnings announcements has been received considerable attention as earnings are considered as the firms' performance indicator. EMH states that an investor cannot beat the market based on any set of new information, whether it is historical, publically available information or private information. The investors' expectation on the extent of excess return that they would make from trading in the stock market is based on several factors and one of them is quarterly earnings announcement news. It has been observed that, during the earnings announcement, stock prices usually rise and invrease price volatility. The earnings announcements are in regular intervals and it provides good opportunity to test whether these announcements generate predictable returns to the investors. As the earnings contain information and influence the stock prices, the investors wait for the earnings announcement season to make money. The investors forecast the earnings on pre-announcement drift, announcement effect and on post announcement drift. There are vast majority of the studies such as Ball and Brown (1968), Brown and Kennelly (1972), Woodruff and Senchack (1988), Bernard and Thomas (1989), Cornell and Landsman (1989) and Bernard and Thomas (1990) who empirically showed that earnings contain information content and traders gained trading on this information flow. The disclosure of accounting numbers of listed companies has significant influence on stock market. This study provides empirical evidence, how stock market reacts to earning announcement in emerging Indian stock market. We examine whether there is any significant relationship between stock returns and quarterly earnings announcements. This paper is organized as follows: section 2 provides a review on literature, section 3 discusses the objectives and hypotheses of the study, section 4 discusses the sample and data, section 5 presents the results and analysis. Finally the concluding remarks are given in section 6.

2. Literature Review

The stock market response to earnings announcement is gained lot of attention in modem finance literature. The previous empirical studies are reviewed in this section. Event studies have a long history and a wide range of applications. One of the first studies of this form was Dolley (1933), where he examined the price effects of stock splits. Similar studies done by Ball and Brown (1968), and Fama et al. (1969), and introduced the abnormal returns model which is very popular and widely applied today. Ball and Brown (1968) are the first to found abnormal returns of firms with positive earnings news which was continued to drift upward after the earnings announcements and that the opposite is true for firms with negative news. Beaver (1968), Brown and Kennelly (1972), Foster (1977), Joy, Litzenberger, and McEnally (1977) and Nichols and Tsay (1979) examined the information content of earnings announcements, and suggested that when there is new information arrival, volume will be larger and price change will reflect the market's overall expectations regarding this information. Foster and Vickrey (1978), Woolridge (1983), Grinblatt et al. (1984), Lakonishok and Vermaelen (1986), Abeyratana, et al. (1993) described considerable positive abnormal returns around the announcement dates of stock dividends which are consistent with the semi-strong form of market efficiency. Patell and Wolfson (1984), Jennings and Starks (1985), and Barclay and Litzenberger (1988) examine the price response to corporate announcements such as earnings, dividends, and seasoned equity offerings and found significant abnormal returns. Watts (1978), Rendleman et al (1982), Foster et al (1984), Bernard and Thomas (1989, 1990) found statistically significant abnormal returns after quarterly earnings announcements. Foster et al. (1984) explained 'post-earnings-announcement drift' and concluded that stock prices fail to adjust abnormal returns fully for new information and have failed to resolve the anomaly. Kormendi and Lipe (1987), and Easton and Zmijewski (1989) supported the existence of efficient market. William and Patricia (1991) argue that the earnings announcements contain some information which is not available to the public. Ball and Kothari (1991) found significant excess return which will be generated on the announcement day because earnings announcement usually include information which are not available to the public. Jegadeesh and Livnat (2006) demonstrated that price announcements contain information and are not available to the market and the stock price cannot fully reflect all the information released to the public, which is against semi-strong form EMH.

Basu (1975) argue that opportunities for earning "abnormal" returns were afforded to investors. Tax-exempt as well as tax-paying investors, who entered the securities markets with the objective of rebalancing their portfolios annually, could have taken advantage of the market disequilibria by acquiring low P/E stocks. From the point of view of these investors, "market inefficiency" seems to have existed. Srinivasan (1997), Rao (1994) and Obaidullah (1990) examined the share price responses to announcement of dividend increase, bonus issue and equity rights and found that the Indian stock market is semi-strong form efficient. Chaturvedi (2000a, 200b) provided evidence for the market inefficiency. Raja et al. (2009) examined the informational efficiency of the Indian stock market in the semi-strong form of EMH and concluded that Indian stock market is efficient. However, Belgaumi (1995) studied the speed of adjustments of stock prices to half-yearly earnings announcements by examining the efficiency of Indian stock market. He concluded that learning lags were existed in the Indian stock market and imbibing of publicly available information was slow. Therefore, Indian stock market is inefficient in the semi-strong form. Mallikarjunappa (2004), Iqbal and Mallikarjunappa (2007, 2008a, 2008b, 2010, 2011) and Iqbal, Mallikarjunappa and Nayak (2007) found that the Indian stock market do not react immediately to quarterly earnings announcements and provided an opportunity to earn abnormal returns. Therefore, they concluded that the Indian stock market is not efficient in the semi-strong form.

The review of the studies shows that there is no clear evidence to accept that Indian stock market is efficient in semi-strong form. Therefore, an attempt is made to test semi-strong form of market efficiency in Indian stock market.

3. Objectives and Hypotheses of the Study

3.1 Objectives of the Study

After analyzing the available literature we develop the following objectives to examine the market efficiency. This study has the following objectives:

- To test whether Indian stock market reacts fast to the quarterly earnings.
- To test the stock market reactions reflect the market efficiency.
- To see the price quality of Indian stock market on the quarterly earnings.
- To see the market frictions in the Indian stock market during the quarterly earnings announcement news.

3.2 Hypotheses of the Study

The following hypotheses are proposed to be tested

1. The investors cannot earn abnormal returns by trading in the stocks after the quarterly earnings announcements.
2. The average abnormal return and cumulative average abnormal return are close to zero.
3. The average abnormal returns occur randomly.
4. There is no significant difference between the number of positive and negative average abnormal returns.

4. Sample and Data

Our study uses event study methodology to examine the informational value in security prices following the quarterly earnings announcement. We observe abnormal return by using daily data. The BSE-500 based companies are selected as sample companies as they diversified and well traded stocks. These companies are considered as top companies as they are ranked based on full market capitalization, average free-float market capitalization and average turnover for preceding 3 months. The BSE-500 companies represent nearly 93% of the total market capitalization on BSE. The highly liquid stocks are the Sensex stocks. We have taken BSE-500 index companies to test on a larger sample and it covers all 20 major industries of the economy. As they are liquid stocks, the impact of quarterly earnings announcement of these companies on the stock prices are expected to be fast. We took all the companies which had announced their quarterly results of September 2012. On the basis of data availability we have selected 469 companies as our final sample. We have used four sets of data. The first set of data consists of quarterly earnings announcement made by the sample companies. Here, we have used media announcement or stock exchange announcement dates, whichever is earlier, as an event for the sample companies. The second set of data consists of daily adjusted closing prices of sample companies which are listed in BSE. The third set of data consists of the daily closing prices of BSE-500 index. Finally, we collected the net profit and net sales of the sample companies for the construction of portfolio. The data is collected from the Center for Monitoring Indian Economy (CMIE).

4.1 Classification of Companies into Portfolios

In this study we have used net profit and net sales as a base for the construction of portfolios. The sample companies are classified as good news; bad news and full sample portfolio based on the percentage change in the net profit and net sales. The percentage changes in the net profit in the current quarter over corresponding quarter in the previous year are ascertained as

(Current Quarter's Net Profit – Corresponding Quarters Net Profit in the Previous Year) / Corresponding Quarters Net Profit in the Previous Year.

The percentage change in the net sales is in the current quarter over corresponding quarter in the previous year are ascertained as calculates as

(Current Quarter's Net Sales – Corresponding Quarters Net Sales in the Previous Year) / Corresponding Quarters Net Sales in the Previous Year.

Based on the above parameters, the first portfolio includes firm with positive change in the net profit and net sales, "good news" portfolio. The second portfolio contains with the negative percentage change in the net profit and net sales, "bad news" portfolio. The third is overall portfolio, which includes all the firms selected as a sample for the study. In case a particular firm's percentage changes in the net profit is positive and net sales is negative and vice versa, in that situation the Sign of percentage change in the net profit is considered as a criterion to include that firm in the portfolio. Based on above parameters we considered 248 companies as good news portfolio, 221 companies as bad news portfolio and 469 as full sample portfolio.

5. Methodology

Fama et al.(1969) is the first available event study methodology. Thereafter, Brown and Warner (1980), Masulis (1980), Dann (1981), Holthausen (1981), Leftwich (1981), DeAngelo and Rice (1983), McNichols and Manegold (1983), Srinivasan

(1997), Mallikarjunappa (2004), Iqbal and Mallikarjunappa (2007, 2008a, 2008b, 2010, 2011) have used this methodology to examine the stock market behavior to various corporate events. We use the same methodology to examine the market reactions on quarterly earnings announcements. The dates on which quarterly earnings announcements are released by the sample companies are defined as the event dates (t = 0). The 61 days surrounding the announcement of earnings (i.e., t = -30,…,0,…, +30) is designated as the "event" period or event window. The days before the event period (i.e., -280,…, -31) are designated as the "estimation" or "non-event" period. The abnormal returns of the companies for the event window are calculated by using mean adjusted model, market adjusted model and market model. The estimated abnormal returns are averaged across securities to calculate average abnormal returns (AARs) and AARs are then cumulated over time to ascertain cumulative average abnormal returns (CAARs).

5.1 Abnormal Return Measures

Let $R_{i,t}$ be the observed arithmetic return for security i on day t, $A_{i,t}$ represent the abnormal return for security i on day t. We use the following three models to estimate the abnormal return for each day in the event period.

5.1.1 Mean Adjusted Model

This model was initially developed by Masulis (1980). This model assumes that the expected return for the given security i is equal to constant $\bar{R}_i$. The abnormal return is equal to the difference between the actual return and expected return.

$$A_{i,t} = R_{i,t} - \bar{R}_i$$

$$\bar{R}_i = \frac{1}{250} \sum_{i=-280}^{-31} \bar{R}_{i,t}$$

Where $A_{i,t}$ represents the abnormal return for security i on day t, $\bar{R}_i$ is the average of security i's daily returns in the estimation period (-280, -31).

5.1.2 Market Adjusted Model

Under this model, the expected returns are equal across securities. The abnormal return is the difference between security return and market return and this model was developed by Cowles (1933) and Latane and Jones (1979).

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

Where $R_{m,t}$ is the return on the BSE-200 index for day t

5.1.3 OLS Market Model

We use Sharpe (1964) market model where, we regress each security return with market return and use α and β coefficients from simple regression to calculate expected return. The abnormal return is the difference between actual return and expected return of each security. The market model is given by:

$$A_{i,t} = \alpha_i + \beta_i R_{mt} + e_{it}$$

Where α_i and β_i are OLS values from the estimation period.
The Beta is calculated using the following equation.

$$\beta_i = \frac{N\sum_{t=1}^{N} R_{mt}R_{it} - (\sum_{t=1}^{N} R_{mt})(\sum_{t=1}^{N} R_{it})}{N(\sum_{t=1}^{N} R_{mt}^2) - N(\sum_{t=1}^{N} R_{mt})^2}$$

Where, β_i= slope of a straight line or beta coefficient of security 'i'. R_{mt} = return on market index 'm' during time period't'. R_{it}= return on security 'i' during time period't'. N = number of observations.

The above three models were used by Brown and Warner (1980, pp. 207-209) to generate excess return. We compute the AARs and CAARs based on this methodology. A number of other studies have also used this methodology. We expect that quarterly earnings impact the stock prices. To account for the general market movements, we fit an OLS that captures the price reactions due to market.

5.2 Average Abnormal Returns (AAR)

The following model is used to calculate average abnormal returns (AARs)

$$AAR_{it} = \frac{\sum_{i=1}^{N} AR_{it}}{N}$$

Where, i represent different securities in the study; N = total number of securities. t = the days surrounding the event day.

5.3 The Cumulated Average Abnormal Return (CAAR)

The AAR values are cumulated over 61-day period to find out cumulative average abnormal return (CAARs) and expect that the CAARs should be close to zero. The following formula is used for the CAARs:

$$CAAR_t = \sum_{t=-30}^{K} AAR_{it}$$

Where t = -30,…..0, …..+30

5.4 Standardized Abnormal Return (SAR) and Standardized Cumulative Average Abnormal Returns (SCAR).

We calculated Standardized Abnormal Return (SAR) where, each excess return A_i, is first divided by its estimated standard deviation to yield a standardized excess return, $A'_{i,t}$. The standardized abnormal returns are then cumulated over time in order to ascertain standardized cumulative average abnormal returns (SCAR).

$$A'_{i,t} = A_{i,t} / \hat{S}(A_{i,t}),$$

Where

$$\hat{S}(A_{i,t)} = \sqrt{\left(\sum_{t=-280}^{t=-31} \left(A_{i,t} - A_i^{*}\right)^2\right) / 249},$$

$$A^{*}_{i} = \frac{1}{250} \sum_{t=-280}^{t=-31} A_{i,t}$$

The test statistics for any given day (t=0) is calculated as

$$\left(\sum_{i=1}^{N_t} A'_{j,t}\right) \cdot (N_t)^{-\frac{1}{2}}$$

Where, N = the number of sample securities at day t.

5.5 Parametric Significance Test

Parametric t test is used to assess the significance of AARs and CAARs. The 5% level of significance with appropriate degree of freedom is used to test the null hypothesis that there are no significant abnormal returns after the event day. It is assumed that if the market is efficient, AARs and CAARs values should be close to zero.

5.5.1 The t Test Statistic for AARs

This statistic is given by:

$$t = \frac{AAR}{\sigma(AAR)}$$

Where AAR =average abnormal return, $\sigma(AAR)$ = standard error of average abnormal return.
The standard error is calculated by using following formula.

$$S.E = \frac{\sigma}{\sqrt{n}}$$

Where, S.E = standard error,σ = standard deviation, n = number of observation

5.5.2 The t Test Statistic for CAARs

This statistic is given by:

$$t = \frac{CAAR}{\sigma(CAAR)}$$

Where, σ (C*AAR*) is the standard error of cumulative average abnormal return.
The standard error is calculated by using the following formula:

$$S.E = \frac{\sigma}{\sqrt{n}}$$

S.E= standard error, σ= standard deviation, n= number of observations.

5.6 Non-Parametric Significance Test

In addition to t test, non-parametric tests like, Runs and Sign tests are used to test the hypothesis.

5.6.1 Runs Test

This test was developed by Levene (1952) to analyze the randomness in the behavior of observed numbers. In this paper we apply Runs test on AARs before and after the event day and also for the entire event window to test for the randomness in the occurrence of AARs.
The Runs test is calculated by using the following formula.

$$\mu_r = \left(\frac{2n_1 n_2}{n_1 + n_2}\right) + 1$$

Where, μ_r= mean number of runs, n_1= number of positive AARs, n_2= number of negative AARs, r = number of runs (actual sequence of counts)

The standard error of the expected number of runs can be calculated by using following formula.

$$\sigma_r = \sqrt{\frac{2n_1n_2(2n_1n_2 - n_1 - n_2)}{(n_1 + n_2)^2(n_1 + n_2 - 1)}}$$

The difference between actual and expected number of the runs is calculated as:

$$Z = \frac{r - \mu_r}{\sigma_r}$$

5.6.2 Sign Test

Mendenhall et al. (1989) developed Sign test which considers positive and negative signs instead of quantitative values. The null hypothesis for this test is that there is no significant difference between the number of positive and negative AARs. We apply Sign test statistics before and after the event day and also for the event window. We compute the standard error using the following formula:

$$\sigma_p = \sqrt{\frac{pq}{n}}$$

Where, σ_p=standard error of the proportion, p = expected proportion of positive AAR=0.5, q = expected proportion of negative AAR=0.5, n = number of AAR

To compute the value of Sign test we use the following equation:

$$Z = \frac{\bar{P} - P_{H0}}{\sigma_P}$$

$\bar{p}$ =actual proportion of AAR in the respective quarters having positive signs.

P_{HO} = hypothesized proportion 0.5

5.7 Cohen et al. (1983a) Methodology

Cohen et al. (1983a,) recognized that inaccuracies in the price discovery process drive security prices away from their intrinsic value, causing nonsynchronous price adjustments. Based on Cohen et al. (1983a) methodology, we estimated the market model regression using ordinary least squares (OLS). This method is used for each stock in the sample using the 20 return intervals spanning one to twenty days for both pre and post-event data. This provides i*20*2 estimates of betas. BSE-500 index is used as proxy to calculate market return.

$$R_{ijkt} = \alpha_{ijk} + \beta_{ijk}R_{mjkt} + e_{ijkt} \quad j = 1....20,\ i = 1.....n\ k = 1, 2\text{-------------------} (1)$$

Where, $R_{ijkt}$is the return to stock *i* on day *t*, for return interval *j*, using the *k* sample periods (*k* has a value of 1 in the pre-call period and has a value of 2 in the post-call period). $R_{mjkt}$is the market returnon day *t*, using interval *j* and sample *k*. According to Schwartz (1991), the first-pass beta is expected to reach its true value asymptotically as the measurement interval, L, approaches infinity. To test this expectation, we used the 40 (pre and post event) first-pass market model regression beta estimates ($b_{j,1LE}$) for each stocks to run the second-pass, stock-specific regression.

$$b_{j,1LE} = a_{j,2} + b_{j,2}\ln(1 + L^{-1}) + C_{j,2}\left(Dummy_{jE} * \ln(1 + L^{-1})\right) + e_{jLH}\text{----------------} (2)$$

Where $b_{j,1LE}$ is the first-pass beta estimate for security j based on L-day stock returns for the time period E; E= BSE-500 companies, and denotes either the period before or after the event; $a_{j,2}$, $b_{j,2}$, and $C_{j,2}$ are second-pass parameter estimates, L is the length of the holding period, in days, for which the stock returns were calculated; $Dummy_{jE}$ is a binary variable equal to one if the first-pass beta is estimated using the post-event data and zero if the first-pass beta is estimated using the pre-event data and e_{jLH} is a stochastic disturbance term. The event study tests are operationalized by an interaction variable that equals 1*$\ln(1 + L^{-1})$ for the post-event period and zero for the pre-event period. This variable is included in Eq. (17) to capture any changes in the relation between L and the first-pass betas after the quarterly earnings announcement. Cohen et al. (1983 a) and Schwartz and Pagano (2003) states that the first-pass beta could be a linear function of the inverse of L. Eq. (2) measures the statistical relation between the first-pass betas [$b_{j,1LE}$ in Eq. (2)'s notation] and the transformed return interval, $\ln(1 + L^{-1})$. This function provides the best linear fit between the first-pass betas and the return interval, L.

Apart from this, we use R square which is influencing by the choice of return intervals. This helps us to see how the exploratory power of the market model, when the return interval is lengthened. R-square is an indicator of information quality and want to see whether low R-square indicate early resolution of uncertainty through the arrival of firm-specific information, or does it indicate a high level of uncertainty that remains unresolved. The low R-square firms have lower future earnings response coefficient, indicating that their current stock price incorporates a smaller amount of future earnings news.

6. Results and Analysis

Table 1 and figure 1 shows the AAR and CAAR values of full sample earnings announcement of mean adjusted model, market adjusted model and market model of September -2012 quarter. In the case of mean adjusted model, the AAR values are positive and significant for -30, -29, -28, -27, -26, -25, -24, -23, -22, -21, -20, -18, -17, -13, -6 -2, 9, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 29 day, positive and insignificant on -19, -16, -14, -11, -10,-7, -3, -1, 1, 2,10, 12,13, 26 day, negative significant on -8, -5 day and negative and insignificant on -15, -12, -9, -4, 0, 3, 4, 5, 6, 8, 27, 28th and 30th day in the event period. Overall, the AARs are positive for 45 days and negative for 16 days and significant for 34 days and insignificant for 27 days during the event window of 61 days. The CAARs are positive and significant throughout the event period and therefore, we reject the null hypothesis that AARs and CAARs are close to zero. In the case of market adjusted model, the AARs are positive and significant for -23, -17, -1, positive and insignificant on -30, -29, -26, -25, -24, -22, -21, -20, -18, -15, -14, -13, -12, -11, -10, -7, -6, -3, -2, 1, 3, 4, 5, 6, 9, 10, 11, 14, 15, 18, 19, 20, 21, 22, 24, 25, 26, 27, 29, 30 and negative and insignificant on -28, -27, -19, -16, -9, -8, -5, -4, 0, 2, 7, 8, 12, 13, 16, 17, 23rd and 28th day in the event window of 61 days. Of the 61 day event window, AARs are positive for 43 days and negative for 18 days and significant for 3 days and insignificant for 58 days in the event window of 61 days. Therefore, we accept the null hypothesis that AARs are close to zero. The CAARs are positive and insignificant on -30, -29, -28, -27, -26, -25, -24 and positive and significant for rest of the period in the event window. The overall result shows that CAARs are significant for 54 days and insignificant for 7 days in the event period. Therefore, we infer that CAARs are not close to zero. When we observe market model, AARs are positive and insignificant for -15, -14, -12, -10, -9, -7, -4, 1, 2, 3, 5, 6, 8, 12, 27, 28, 30 day, positive and significant on -30, -29, -28, -27, -26, -25, -24, -23, -22, -21, -20, -19, -18, -17, -16, -13, -11, -6, -3, -2, -1, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 29 day, negative significant on -8th day, negative and insignificant on -5, 0, 4 and 7th day in the event period. Overall, the AARs are positive for 56 days and negative for 5 days and significant for 40 days and insignificant for 21 days for the event period. In the case of CAARs, they are positive and significant for the entire event window of 61 days. Therefore, we infer that AARs and CAARs are not close to zero under market model.

Table 1 *AAR and CAAR values of Full Sample Earnings Announcements*

Days	Mean adjusted model				Market adjusted model				Market model			
	AAR	t value	CAAR	t value	AAR	t value	CAAR	t value	AAR	t value	CAAR	t value
-30	0.25548	5.85145*	0.25548	5.85145*	0.09378	1.90006	0.09378	1.90006	0.30013	6.77528*	0.30013	6.77528*
-29	0.15965	3.69062*	0.41513	6.78587*	0.02508	0.53356	0.11887	1.78797	0.20385	4.66489*	0.50399	8.15508*
-28	0.25766	5.85307*	0.67279	8.82381*	-0.00107	-0.02167	0.11780	1.37636	0.29060	6.49440*	0.79459	10.25238*
-27	0.15201	3.42655*	0.82480	9.29630*	-0.06878	-1.48127	0.04902	0.52790	0.18428	4.17348*	0.97887	11.08423*
-26	0.21247	4.50019*	1.03727	9.82504*	0.01810	0.36402	0.06712	0.60364	0.25481	5.56629*	1.23369	12.05207*
-25	0.16898	3.99179*	1.20626	11.63304*	0.07399	1.60758	0.14112	1.25164	0.20844	4.84856*	1.44213	13.69470*
-24	0.31943	6.54222*	1.52569	11.81042*	0.03449	0.64690	0.17561	1.24498	0.35652	7.26855*	1.79866	13.85981*
-23	0.26786	6.15825*	1.79354	14.57873*	0.10611	2.27670*	0.28172	2.13704*	0.29791	6.74925*	2.09657	16.79307*
-22	0.17563	3.92246*	1.96918	14.65934*	0.06094	1.29801	0.34266	2.43291*	0.20841	4.56265*	2.30498	16.82074*
-21	0.11944	2.87238*	2.08862	15.88323*	0.07038	1.60657	0.41303	2.98164*	0.15750	3.58824*	2.46248	17.74058*
-20	0.08722	1.98535*	2.17584	14.93364*	0.01448	0.31591	0.42751	2.81271*	0.11960	2.64001*	2.58208	17.18555*
-19	0.09706	1.93357	2.27290	13.07108*	-0.03148	-0.63588	0.39603	2.30935*	0.13381	2.59842*	2.71589	15.22423*
-18	0.15952	3.63209*	2.43242	15.36057*	0.07038	1.59056	0.46641	2.92333*	0.19163	4.21741*	2.90753	17.74692*
-17	0.14255	3.62276*	2.57497	17.48990*	0.11019	2.54622*	0.57661	3.56086*	0.18368	4.60887*	3.09120	20.73018*
-16	0.04254	1.08255	2.61750	17.19934*	-0.03123	-0.77669	0.54537	3.50164*	0.09119	2.27567*	3.18239	20.50618*
-15	-0.00994	-0.24571	2.60756	16.10984*	0.03666	0.89831	0.58203	3.56574*	0.01578	0.37242	3.19817	18.86696*
-14	0.01137	0.29856	2.61893	16.67423*	0.02310	0.54436	0.60513	3.45817*	0.04992	1.25507	3.24810	19.80477*
-13	0.11254	2.68667*	2.73147	15.37036*	0.03880	0.89108	0.64393	3.48613*	0.15512	3.56324*	3.40322	18.42555*
-12	-0.01279	-0.29407	2.71868	14.33708*	0.02942	0.67052	0.67335	3.52034*	0.03322	0.73842	3.43645	17.52149*
-11	0.08372	1.77154	2.80239	13.26039*	0.03120	0.66593	0.70455	3.36243*	0.12504	2.59689*	3.56149	16.53899*
-10	0.00292	0.07740	2.80531	16.21902*	0.04555	1.15709	0.75010	4.15818*	0.04037	1.03888	3.60186	20.22559*
-9	-0.01462	-0.38648	2.79070	15.73201*	-0.02619	-0.65799	0.72391	3.87682*	0.01913	0.47623	3.62099	19.22317*
-8	-0.17059	-4.29363*	2.62011	13.75070*	-0.06968	-1.63508	0.65423	3.20103*	-0.13629	-3.20313*	3.48470	17.07714*
-7	0.00041	0.00986	2.62052	12.72013*	0.03702	0.86358	0.69125	3.29165*	0.03701	0.84039	3.52170	16.32515*
-6	0.08111	2.17279*	2.70163	14.47426*	0.00839	0.22177	0.69963	3.70015*	0.12639	3.24705*	3.64809	18.74512*
-5	-0.07543	-2.01950*	2.62620	13.78938*	-0.07434	-1.88542	0.62529	3.11001*	-0.03340	-0.83700	3.61469	17.76747*
-4	-0.01389	-0.37231	2.61231	13.47138*	-0.03234	-0.84996	0.59294	2.99871*	0.02325	0.59093	3.63794	17.79795*
-3	0.05061	1.36609	2.66292	13.58333*	0.07556	1.93076	0.66851	3.22803*	0.08260	2.08895*	3.72053	17.78263*
-2	0.14894	3.68330*	2.81186	12.91288*	0.06578	1.56599	0.73429	3.24612*	0.18258	4.35385*	3.90312	17.28323*
-1	0.04169	1.09148	2.85355	13.63903*	0.07730	1.97747*	0.81159	3.79071*	0.08420	2.14312*	3.98732	18.52852*
0	-0.12096	-1.90683	2.73259	7.73690*	-0.06850	-1.02809	0.74309	2.00319*	-0.09725	-1.50473	3.89007	10.81068*
1	0.06526	1.05207	2.79785	7.97366*	0.05895	0.90282	0.80204	2.17148*	0.09450	1.48499	3.98458	11.06830*

2	0.03489	0.92290	2.83274	13.04374*	-0.02412	-0.59031	0.77792	3.31478*	0.06755	1.71741	4.05212	17.93440*
3	-0.02919	-0.75642	2.80355	12.45999*	0.03472	0.86789	0.81264	3.48403*	0.00582	0.14591	4.05794	17.44730*
4	-0.04207	-1.09148	2.76148	12.11010*	0.02230	0.55480	0.83494	3.51050*	-0.00887	-0.22090	4.04907	17.03935*
5	-0.00949	-0.24921	2.75199	12.04239*	0.00518	0.13367	0.84012	3.61477*	0.02761	0.68058	4.07668	16.74648*
6	-0.01827	-0.50141	2.73372	12.33394*	0.00922	0.24426	0.84934	3.69793*	0.01867	0.47747	4.09535	17.22126*
7	-0.07715	-2.19762*	2.65657	12.27624*	-0.03273	-0.90278	0.81662	3.65433*	-0.03385	-0.91979	4.06150	17.90109*
8	-0.02358	-0.59576	2.63300	10.65375*	-0.03210	-0.79258	0.78452	3.10181*	0.01265	0.30672	4.07415	15.81585*
9	0.08879	2.15171*	2.72179	10.42866*	0.05228	1.23764	0.83679	3.13235*	0.12109	2.85662*	4.19524	15.64821*
10	0.09179	1.79208	2.81358	8.57909*	0.02023	0.40046	0.85703	2.64897*	0.12410	2.48621*	4.31935	13.51375*
11	0.10992	2.62883*	2.92349	10.78899*	0.05862	1.38209	0.91565	3.33094*	0.14920	3.40723*	4.46855	15.74562*
12	0.04531	1.12342	2.96880	11.22633*	-0.04055	-0.97446	0.87510	3.20686*	0.07192	1.71737	4.54047	16.53459*
13	0.06875	1.48427	3.03755	9.88584*	-0.01929	-0.39906	0.85581	2.66946*	0.10423	2.20328*	4.64469	14.80210*
14	0.16716	3.51936*	3.20471	10.05811*	0.01155	0.21311	0.86736	2.38552*	0.19902	4.08082*	4.84372	14.80529*
15	0.19615	3.73547*	3.40087	9.54898*	0.06042	1.16011	0.92778	2.62659*	0.20314	4.32835*	5.04686	15.85503*
16	0.11756	2.76577*	3.51843	12.07434*	-0.00709	-0.15671	0.92069	2.96738*	0.15474	3.53277*	5.20160	17.32230*
17	0.16519	3.88548*	3.68361	12.50601*	-0.00482	-0.10634	0.91587	2.91404*	0.20340	4.66511*	5.40500	17.89301*
18	0.23798	5.28883*	3.92159	12.45064*	0.04206	0.89182	0.95793	2.90146*	0.27657	6.11529*	5.68157	17.94653*
19	0.23455	4.55823*	4.15614	11.42251*	0.06889	1.34286	1.02682	2.83057*	0.26040	5.32247*	5.94197	17.17603*
20	0.11275	2.61385*	4.26889	13.85766*	0.01861	0.42090	1.04543	3.31166*	0.14424	3.20125*	6.08621	18.91432*
21	0.08719	2.07791*	4.35609	14.39569*	0.00356	0.08445	1.04899	3.44700*	0.12742	2.94196*	6.21363	19.89525*
22	0.15148	3.63245*	4.50757	14.84750*	0.04007	0.90036	1.08906	3.36150*	0.19341	4.51210*	6.40704	20.53119*
23	0.12950	3.35462*	4.63707	16.34633*	-0.00733	-0.17606	1.08173	3.53462*	0.16799	4.26838*	6.57503	22.73435*
24	0.10576	2.53234*	4.74283	15.31251*	0.03876	0.87087	1.12048	3.39507*	0.14783	3.41573*	6.72286	20.94590*
25	0.12647	2.70322*	4.86930	13.90847*	0.05159	1.03911	1.17207	3.15479*	0.16485	3.47923*	6.88771	19.42543*
26	0.04146	1.03866	4.91076	16.29367*	0.03767	0.91236	1.20974	3.88051*	0.08380	2.02247*	6.97151	22.28545*
27	-0.00605	-0.15472	4.90471	16.46645*	0.00729	0.18359	1.21704	4.02248*	0.03154	0.79861	7.00304	23.28680*
28	-0.02653	-0.63742	4.87818	15.25820*	-0.01580	-0.36654	1.20123	3.62735*	0.00563	0.13270	7.00867	21.50321*
29	0.10687	2.87550*	4.98504	17.31646*	0.03851	0.98651	1.23974	4.10040*	0.13932	3.54324*	7.14800	23.46857*
30	-0.00027	-0.00772	4.98477	18.15563*	0.00885	0.23761	1.24859	4.29433*	0.04473	1.20989	7.19273	24.90993*

Note: * Indicates Statistically Significant At 5% Level Of Significance.

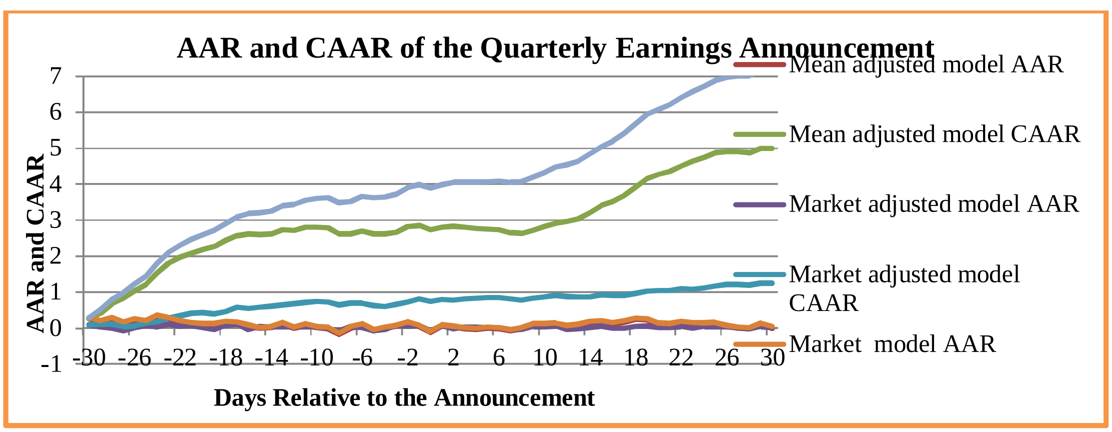

Figure 1 *AARs and CAARs Trends of Three Models over the 61-Day Event Window of Full Sample Earnings Announcement of September 2012 Quarter*

Table 2 and figure 2 presents the results of good news earnings announcement. In the case of mean adjusted model, AARs are positive and insignificant for -27, -21, -19, -16, -14, -13, -12, -11, -10, -9, -7, -3, -1, 0, 2, 6, 8, 9, 10, 12 13, 14, 20, 21, 26, 30, positive and significant on -30, -29, -28, -26, -25, -24, -23, -22, -18, -17, -6, -2, 1, 11, 15, 16, 17, 18, 19, 22, 23, 24, 25, 29, negative and significant on -8 and negative and insignificant on -20, -15, -5, -4, 3, 4, 5, 7, 27^{th} and 28^{th} day in the event period. The AARs are positive for 50 days and negative for 11 days and significant for 24 days and insignificant for 37 days in the entire event window. Therefore we infer that AARs are close to zero. The CAARs are positive and in significant entire event period and therefore we reject the null hypothesis that CAARs are close to zero. The market adjusted model shows that AARs are negative and insignificant on- 24, -20, -19, -16, -15, -11, -5, -4, 2, 5, 10, 12, 14, 19, 20, 21 23, 28, negative and significant on -28, -27, -8, positive and insignificant on -30, -29, -26, -23, -22, -21, -14, -13, -12, -10, -9, -7, -6, -3, -2, -1, 0, 3, 4, 6, 7, 8, 9, 11, 13, 15, 16, 17, 18, 22, 24, 25, 26, 27,29, 30 and positive significant on -25, -18, -17, 1st day in the event period. The result from overall window shows that AARs are positive for 40 days and negative for 11 days and insignificant for 54 days. Therefore we accept the null hypothesis that AARs are close to zero. The CAARs are negative and insignificant on -28, -27, -26, positive and insignificant on -30, -29, -25, -24, -23, -22, -21, -20, -19, -18, -8 and positive and significant on -17, -16, -15, -14, -13, -12, -11, -10, -9, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, and 30th day in the event period of 61 days. Overall, the CAARs are positive for 58 days and significant for 46 days. Therefore, we infer that CAARs are not close to zero. In the case of market model AARs are negative and insignificant on -15, negative and significant on -8, positive insignificant on -20, -16, -12, -11, -10, -9, -7, -5, -4, -3, -1, 0, 2, 3, 4, 5, 6, 7, 8, 10, 13, 20, 26, 27, 28, 30 and positive significant -30, -29, -28, -27, -26, -25, -24, -23, -22, -21, -19, -18, -17, -14, -13, -6, -2, 1, 9, 11, 12, 14, 15, 16, 17, 18, 19, 21, 22, 23 and 24th day in the event period of 61 days. The AARs are positive for 59 days and negative for 2 days and significant for 33 days and insignificant for 28 days. The CAARs are positive and significant for throughout the window period. Therefore we reject the null hypothesis that AARs and CAARs are close to zero.

Table 2 *AAR and CAAR Values of Good News Earnings Announcements*

Days	Mean adjusted model				Market adjusted model				Market model			
	AAR	t value	CAAR	t value	AAR	t value	CAAR	t value	AAR	t value	CAAR	t value
-30	0.20951	3.79656*	0.20951	3.79656*	0.05505	0.88259	0.05505	0.88259	0.26585	4.71016*	0.26585	4.71016*
-29	0.14320	2.43661*	0.35270	4.24371*	0.02858	0.44910	0.08363	0.92923	0.19807	3.34828*	0.46392	5.54532*
-28	0.11140	1.96036	0.46410	4.71515*	-0.16526	-2.50989*	-0.08163	-0.71574	0.16454	2.89858*	0.62846	6.39209*
-27	0.09940	1.77874	0.56350	5.04202*	-0.13260	-2.25045*	-0.21423	-1.81788	0.15165	2.73874*	0.78011	7.04417*
-26	0.25034	3.55189*	0.81384	5.16390*	0.05319	0.74308	-0.16104	-1.00619	0.29629	4.55875*	1.07640	7.40652*
-25	0.27775	4.68664*	1.09160	7.51949*	0.21144	3.40517*	0.05040	0.33136	0.32971	5.56178*	1.40611	9.68338*
-24	0.27809	4.16978*	1.36968	7.76257*	-0.01235	-0.16130	0.03805	0.18783	0.32972	4.89788*	1.73583	9.74599*
-23	0.24732	4.10933*	1.61701	9.49891*	0.09512	1.46503	0.13317	0.72516	0.29769	5.04015*	2.03352	12.17253*
-22	0.19442	3.23490*	1.81143	10.04640*	0.06729	1.11640	0.20046	1.10867	0.24604	4.09051*	2.27956	12.63300*
-21	0.09478	1.65269	1.90621	10.51155*	0.05843	0.93959	0.25889	1.31651	0.14731	2.46878*	2.42687	12.86135*
-20	-0.00313	-0.05203	1.90307	9.52405*	-0.08577	-1.40428	0.17312	0.85465	0.05253	0.85942	2.47940	12.23087*
-19	0.11648	1.61590	2.01955	8.08766*	-0.00545	-0.07498	0.16767	0.66563	0.16669	2.26668*	2.64609	10.38721*
-18	0.22536	3.66806*	2.24492	10.13407*	0.16773	2.75012*	0.33540	1.52519	0.27641	4.46106*	2.92250	13.08167*
-17	0.16974	3.14793*	2.41465	11.96843*	0.14502	2.47422*	0.48042	2.19065*	0.22336	4.08856*	3.14586	15.39028*
-16	0.04416	0.82951	2.45881	11.92647*	-0.02044	-0.37816	0.45998	2.19781*	0.09735	1.78019	3.24321	15.31249*
-15	-0.06642	-1.16259	2.39239	10.46938*	-0.00880	-0.15342	0.45118	1.96609	-0.01475	-0.25685	3.22846	14.05210*
-14	0.05251	1.01193	2.44491	11.42643*	0.08128	1.34841	0.53246	2.14234*	0.10758	2.01154*	3.33604	15.12810*
-13	0.08248	1.52303	2.52739	10.99996*	0.01462	0.25245	0.54709	2.22599*	0.13688	2.39367*	3.47292	14.31448*
-12	0.01430	0.24128	2.54169	9.83730*	0.07040	1.18392	0.61749	2.38240*	0.06714	1.09213	3.54007	13.21039*
-11	0.02791	0.44025	2.56960	9.06402*	-0.02998	-0.47350	0.58751	2.07503*	0.08170	1.27554	3.62176	12.64442*
-10	0.00360	0.07259	2.57320	11.32905*	0.06317	1.17430	0.65068	2.63951*	0.05863	1.13954	3.68039	15.60960*
-9	0.02862	0.55710	2.60182	10.79737*	0.00919	0.17709	0.65987	2.71062*	0.08198	1.51966	3.76237	14.86929*
-8	-0.27911	-4.75073*	2.32270	8.24351*	-0.16582	-2.63914*	0.49405	1.63954	-0.22458	-3.65030*	3.53779	11.99013*
-7	0.04859	0.83063	2.37130	8.27388*	0.10581	1.73099	0.59985	2.00321*	0.10183	1.68773	3.63962	12.31311*
-6	0.13603	2.79185*	2.50733	10.29219*	0.06650	1.32187	0.66635	2.64917*	0.19013	3.77314*	3.82976	15.20004*
-5	-0.03046	-0.54186	2.47686	8.64024*	-0.01249	-0.21117	0.65386	2.16779*	0.02174	0.37965	3.85150	13.19178*
-4	-0.00072	-0.01434	2.47614	9.52093*	-0.01231	-0.23335	0.64155	2.34058*	0.05434	1.02034	3.90583	14.11523*
-3	0.04690	0.86990	2.52305	8.84321*	0.09880	1.69523	0.74035	2.40057*	0.10145	1.79448	4.00728	13.39513*
-2	0.14963	2.45538*	2.67268	8.14408*	0.06095	0.93768	0.80131	2.28909*	0.20015	3.20352*	4.20744	12.50501*
-1	0.00145	0.02863	2.67413	9.60838*	0.04682	0.88469	0.84813	2.92592*	0.05378	1.03061	4.26122	14.90907*

0	0.07246	0.86623	2.74659	5.89739*	0.13743	1.55305	0.98555	2.00038*	0.11592	1.38829	4.37713	9.41539*
1	0.21326	2.36479*	2.95985	5.80207*	0.20835	2.25313*	1.19390	2.28238*	0.25656	2.81246*	4.63369	8.97947*
2	0.04730	0.83258	3.00714	9.21525*	-0.01642	-0.26611	1.17748	3.32130*	0.09878	1.72760	4.73247	14.40794*
3	-0.00636	-0.11553	3.00079	9.35543*	0.07130	1.26924	1.24878	3.81218*	0.04824	0.86565	4.78072	14.71179*
4	-0.00114	-0.02094	2.99964	9.27191*	0.07323	1.30669	1.32201	3.98739*	0.05172	0.92805	4.83243	14.65824*
5	-0.02089	-0.38031	2.97875	9.03726*	-0.00999	-0.17777	1.31202	3.88972*	0.02756	0.48344	4.86000	14.20605*
6	0.03992	0.74986	3.01868	9.32096*	0.06941	1.23161	1.38143	4.02961*	0.09356	1.65879	4.95355	14.43880*
7	-0.01806	-0.36627	3.00062	9.87217*	0.05409	1.05978	1.43552	4.56253*	0.03267	0.65114	4.98622	16.12125*
8	0.04445	0.82514	3.04507	9.05103*	0.05613	1.06046	1.49166	4.51234*	0.09507	1.73273	5.08129	14.83007*
9	0.08489	1.34253	3.12996	7.82662*	0.05931	0.91270	1.55097	3.77374*	0.13719	2.15092*	5.21848	12.93651*
10	0.05024	0.82107	3.18020	8.11712*	-0.00902	-0.14442	1.54195	3.85463*	0.10147	1.62585	5.31995	13.31219*
11	0.14045	2.24942*	3.32065	8.20614*	0.10802	1.71215	1.64997	4.03541*	0.19285	3.02480*	5.51281	13.34196*
12	0.05681	1.02718	3.37746	9.31249*	-0.00880	-0.15498	1.64116	4.40587*	0.11058	1.98139*	5.62339	15.36536*
13	0.07302	1.14170	3.45048	8.13370*	0.00163	0.02359	1.64279	3.58043*	0.12641	1.94664	5.74980	13.34844*
14	0.11879	1.86783	3.56926	8.36657*	-0.03392	-0.46187	1.60887	3.26548*	0.17213	2.68574*	5.92193	13.77421*
15	0.19987	2.42297*	3.76913	6.73710*	0.05834	0.73907	1.66721	3.11420*	0.21634	3.33974*	6.13827	13.97128*
16	0.13705	2.43876*	3.90618	10.13870*	0.01454	0.25063	1.68175	4.22741*	0.19035	3.37769*	6.32862	16.38072*
17	0.18960	2.94642*	4.09578	9.18693*	0.02172	0.31649	1.70348	3.58223*	0.23974	3.71469*	6.56836	14.69012*
18	0.28826	4.34236*	4.38405	9.43437*	0.10214	1.50055	1.80561	3.78962*	0.33931	5.11345*	6.90766	14.87148*
19	0.17586	2.25264*	4.55990	8.26050*	-0.00296	-0.03921	1.80265	3.37514*	0.21429	2.94964*	7.12195	13.86367*
20	0.05451	0.84197	4.61442	9.97970*	-0.03862	-0.57768	1.76403	3.69486*	0.10559	1.56376	7.22755	14.98795*
21	0.06430	1.13526	4.67871	11.45562*	-0.01454	-0.25594	1.74949	4.27066*	0.11650	1.96472	7.34405	17.17493*
22	0.14248	2.28697*	4.82119	10.63007*	0.03784	0.55209	1.78733	3.58181*	0.19737	3.13899*	7.54142	16.47508*
23	0.12505	2.58741*	4.94624	13.92691*	-0.00811	-0.14817	1.77923	4.42628*	0.17909	3.63030*	7.72051	21.29681*
24	0.13820	2.74441*	5.08445	13.61408*	0.07998	1.48316	1.85921	4.64884*	0.19122	3.55034*	7.91173	19.80725*
25	0.19528	2.79853*	5.27973	10.11065*	0.13695	1.82718	1.99616	3.55895*	0.24517	3.45987*	8.15690	15.38232*
26	0.02075	0.35410	5.30048	11.98055*	0.03229	0.54292	2.02845	4.51728*	0.07226	1.19352	8.22916	18.00418*
27	-0.01570	-0.32184	5.28478	14.22046*	0.00532	0.10453	2.03377	5.24491*	0.03803	0.76067	8.26719	21.71342*
28	-0.03206	-0.60154	5.25271	12.82912*	-0.01578	-0.28175	2.01800	4.69154*	0.02323	0.42195	8.29042	19.60326*
29	0.17032	3.08346*	5.42303	12.67489*	0.10115	1.71521	2.11914	4.63927*	0.22360	3.93251*	8.51402	19.33144*
30	0.01679	0.33639	5.43982	13.95246*	0.04568	0.84802	2.16482	5.14547*	0.07049	1.37442	8.58451	21.43121*

Note*: * Indicates Statistically Significant At 5% Level of Significance.*

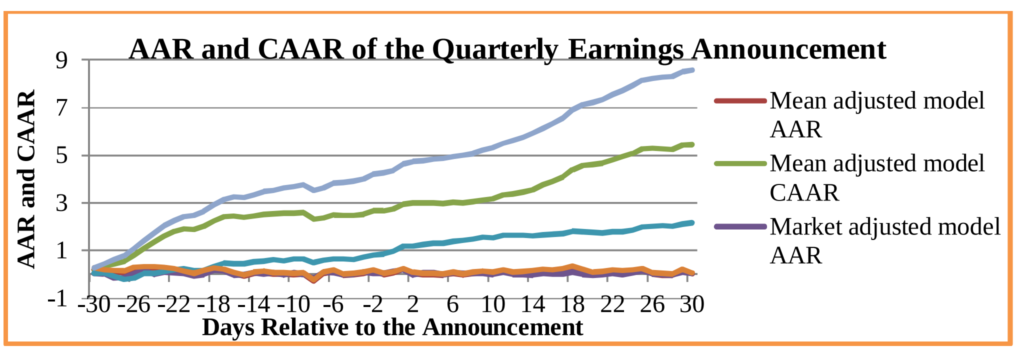

Figure 2 *AARs and CAARs Trends of Three Models over the 61-Day Event Window of Good News Earnings Announcement of September 2012 Quarter*

Table 3 and figure 3 present the AAR and CAAR values of bad sample earnings announcement of mean adjusted model, market adjusted model and market model of September -2012 quarter. In the case of mean adjusted model, the AARs are positive and significant for -30, -29, -28, -27, -26, -24, -23, -22, -21, -20, -17, -13, -11, -2, 14, 15, 17, 18, 19, 20, 22, 23, positive and insignificant -25, -19, -18, -16, -15, -10, -6, -3, -1, 2, 5, 9, 10, 11, 12, 13, 16, 21, 24, 25, 26, 27, 29, negative and significant on -5, 0, 7 and negative and insignificant on -14, -12, -9, -8, -7, -4, 1, 3, 4,6, 8, 28 and 30th day in the event period. Of the 61 day event window, AARs are positive for 45 days and significant for 25 days in the event window of 61 days. It is further observed that the CAAR values are positive and significant throughout the event period. Therefore, we accept that AARs are close to zero and CAARs are not close to zero. In the case of market adjusted model, the AAR values are positive and insignificant for on -30, -29, -24, -23, -22, -21, -20, -17, -15, -13, -11, -10, -8, -3, -2, -1, 5, 9, 10, 11, 14, 15, 20, 21, 22, 26, 27, positive and significant on -28, 19, negative and significant on -5, 0, 7, 8 and negative and insignificant -27, -26, -25, -19, -18, -16, -14, -12, -9, -7, -6, -4, 1, 2, 3, 4, 6, 12, 13, 16, 17, 18, 23, 24, 25, 28, 29, 30th day in the overall window period. Overall, the AARs are positive for 29 days and negative for 32 days and significant for 6 days and insignificant for 55 days during the event window of 61 days. Therefore we infer that AARs are close to zero. The CAARs are positive and insignificant on -30, -29, -25, -24, -4, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30 and positive and significant on -28, -27, -26, -23, -22, -21, -20, -19, -18, -17, -16, -15, -14, -13, -12, -11, -10, -9, -8, -7, -6, -5, -3, -2, -1st day in the event window period. The CAARs are positive for 61 days and insignificant for 36 days. Therefore we accept the null hypothesis that CAARs are close to zero. When we observe market model, AARs are positive and insignificant for -25, -19, -18, -16, -15, -10, -6, -3, 2, 5, 9, 10, 11, 12, 13, 16, 24, 25, 26, 27, 29, 30, positive and significant on -30, -29, -28, -27, -26, -24, -23, -22, -21, -20, -17, -13, -11, -2, -1, 14, 15, 17, 18, 19, 20,21, 22,23, negative and significant on 0, and negative and insignificant on -14, -12, -9, -8, -7, -5, -4, 1, 3, 4, 6, 7, 8, 28th day in the event period. Overall, the AARs are positive for 46 days and negative for 15 days and significant for 24 days and insignificant for 37 days for the event period. Therefore, we accept the null hypothesis that AARs are close to zero. The CAARs are positive and significant throughout the event period of 61 days and therefore we infer that CAARs are not close to zero.

Table 3 *AAR and CAAR Values of Bad News Earnings Announcements*

Days	Mean adjusted model				Market adjusted model				Market model			
	AAR	t value	CAAR	t value	AAR	t value	CAAR	t value	AAR	t value	CAAR	t value
-30	0.30408	4.45393*	0.30408	4.45393*	0.13473	1.74371	0.13473	1.74371	0.33637	4.88025*	0.33637	4.88025*
-29	0.17704	2.77389*	0.48112	5.33042*	0.02138	0.30719	0.15611	1.58580	0.20996	3.24467*	0.54634	5.96997*
-28	0.41226	6.21185*	0.89338	7.77190*	0.17248	2.38016*	0.32859	2.61792*	0.42385	6.15762*	0.97019	8.13755*
-27	0.20762	2.98747*	1.10100	7.92127*	-0.00131	-0.01811	0.32728	2.26422*	0.21878	3.14733*	1.18897	8.55221*
-26	0.17244	2.76544*	1.27344	9.13292*	-0.01898	-0.27543	0.30830	2.00042*	0.21097	3.27487*	1.39994	9.71843*
-25	0.05401	0.90500	1.32745	9.08124*	-0.07129	-1.06331	0.23701	1.44320	0.08027	1.30726	1.48021	9.84197*
-24	0.36313	5.07327*	1.69058	8.92712*	0.08400	1.13459	0.32100	1.63886	0.38486	5.37232*	1.86507	9.84016*
-23	0.28956	4.59502*	1.98015	11.10952*	0.11773	1.75499	0.43873	2.31235*	0.29815	4.51318*	2.16322	11.57724*
-22	0.15577	2.33186*	2.13592	10.65808*	0.05423	0.74579	0.49296	2.25982*	0.16864	2.43619*	2.33186	11.22890*
-21	0.14552	2.40787*	2.28144	11.93777*	0.08301	1.34388	0.57597	2.94881*	0.16827	2.59936*	2.50013	12.21281*
-20	0.18272	2.87124*	2.46416	11.67495*	0.12044	1.76777	0.69640	3.08198*	0.19049	2.84431*	2.69061	12.11346*
-19	0.07653	1.09605	2.54069	10.50407*	-0.05899	-0.88155	0.63741	2.74977*	0.09906	1.37467	2.78968	11.17529*
-18	0.08992	1.43619	2.63061	11.65248*	-0.03252	-0.51056	0.60490	2.63419*	0.10202	1.53860	2.89170	12.09511*
-17	0.11381	1.97823*	2.74442	12.74949*	0.07338	1.14717	0.67828	2.83380*	0.14174	2.43600*	3.03343	13.93378*
-16	0.04083	0.70211	2.78525	12.36708*	-0.04265	-0.71144	0.63563	2.73775*	0.08467	1.43803	3.11810	13.67364*
-15	0.04975	0.87050	2.83500	12.40104*	0.08471	1.46049	0.72034	3.10492*	0.04806	0.76755	3.16616	12.64174*
-14	-0.03211	-0.57417	2.80288	12.15436*	-0.03839	-0.64481	0.68195	2.77776*	-0.01103	-0.18686	3.15514	12.96922*
-13	0.14430	2.23885*	2.94719	10.77751*	0.06434	0.98323	0.74629	2.68792*	0.17441	2.63531*	3.32954	11.85822*
-12	-0.04143	-0.64767	2.90576	10.42058*	-0.01389	-0.21431	0.73240	2.59304*	-0.00263	-0.03981	3.32692	11.57103*
-11	0.14271	2.02838*	3.04846	9.68879*	0.09587	1.38451	0.82827	2.67470*	0.17086	2.36255*	3.49778	10.81464*
-10	0.00221	0.03842	3.05067	11.59521*	0.02692	0.46620	0.85520	3.23168*	0.02107	0.35912	3.51885	13.08647*
-9	-0.06032	-1.08364	2.99035	11.45367*	-0.06360	-1.04572	0.79160	2.77497*	-0.04731	-0.79414	3.47154	12.42283*
-8	-0.05588	-1.07065	2.93447	11.72313*	0.03194	0.56454	0.82354	3.03487*	-0.04296	-0.73975	3.42858	12.30981*
-7	-0.05051	-0.83577	2.88396	9.74056*	-0.03569	-0.59718	0.78785	2.69082*	-0.03152	-0.49135	3.39706	10.81046*
-6	0.02306	0.40593	2.90702	10.23319*	-0.05304	-0.93698	0.73481	2.59623*	0.05900	0.99051	3.45606	11.60388*
-5	-0.12296	-2.52853*	2.78406	11.22792*	-0.13972	-2.71598*	0.59509	2.26862*	-0.09167	-1.65772	3.36439	11.93147*
-4	-0.02782	-0.49929	2.75624	9.51915*	-0.05352	-0.97270	0.54157	1.89415	-0.00962	-0.16533	3.35477	11.09865*
-3	0.05453	1.07526	2.81077	10.47391*	0.05100	0.98251	0.59257	2.15737*	0.06266	1.13382	3.41744	11.68534*

-2	0.14821	2.80890*	2.95898	10.41381*	0.07088	1.34911	0.66345	2.34489*	0.16401	2.94920*	3.58145	11.95884*
-1	0.08422	1.46908	3.04320	9.69115*	0.10951	1.89463	0.77296	2.44153*	0.11636	1.96835	3.69781	11.42035*
0	-0.32540	-3.45171*	2.71780	5.17781*	-0.28616	-2.91031*	0.48680	0.88920	-0.32257	-3.31174*	3.37524	6.22384*
1	-0.09118	-1.08833	2.62662	5.54231*	-0.09897	-1.08574	0.38783	0.75210	-0.07679	-0.87947	3.29845	6.67784*
2	0.02178	0.43967	2.64840	9.30754*	-0.03225	-0.60716	0.35558	1.16542	0.03453	0.64157	3.33298	10.77867*
3	-0.05332	-0.98543	2.59507	8.22457*	-0.00396	-0.06946	0.35162	1.05843	-0.03902	-0.68351	3.29396	9.89514*
4	-0.08533	-1.57302	2.50974	7.82046*	-0.03152	-0.54715	0.32010	0.93909	-0.07292	-1.26230	3.22105	9.42547*
5	0.00256	0.04853	2.51230	7.94385*	0.02121	0.39884	0.34131	1.06949	0.02766	0.47811	3.24871	9.35783*
6	-0.07978	-1.61836	2.43252	8.11195*	-0.05440	-1.09632	0.28691	0.95061	-0.06049	-1.12854	3.18822	9.77816*
7	-0.13960	-2.80565*	2.29292	7.47541*	-0.12449	-2.44647*	0.16242	0.51777	-0.10417	-1.93802	3.08404	9.30766*
8	-0.09549	-1.64872	2.19743	6.07566*	-0.12536	-2.04716*	0.03705	0.09689	-0.07446	-1.21007	3.00958	7.83154*
9	0.09292	1.77076	2.29035	6.90127*	0.04484	0.84047	0.08190	0.24270	0.10408	1.87787	3.11366	8.88288*
10	0.13571	1.63078	2.42605	4.55309*	0.05116	0.63666	0.13306	0.25860	0.14803	1.87857	3.26169	6.46449*
11	0.07764	1.40625	2.50369	6.99752*	0.00641	0.11407	0.13947	0.38292	0.10307	1.72468	3.36476	8.68777*
12	0.03314	0.56205	2.53684	6.56043*	-0.07411	-1.21370	0.06536	0.16323	0.03105	0.49452	3.39580	8.24829*
13	0.06425	0.95473	2.60109	5.82698*	-0.04140	-0.61338	0.02396	0.05352	0.08078	1.16923	3.47658	7.58643*
14	0.21829	3.07938*	2.81938	5.92888*	0.05962	0.74460	0.08358	0.15561	0.22745	3.06977*	3.70403	7.45224*
15	0.19223	3.00589*	3.01161	6.94328*	0.06262	0.92936	0.14620	0.31992	0.18919	2.77432*	3.89322	8.41778*
16	0.09695	1.50885	3.10856	7.05676*	-0.02996	-0.42721	0.11623	0.24174	0.11710	1.73125	4.01031	8.64842*
17	0.13938	2.53135*	3.24795	8.51391*	-0.03289	-0.55941	0.08335	0.20465	0.16499	2.83185*	4.17531	10.34357*
18	0.18482	3.06458*	3.43277	8.13142*	-0.02144	-0.32991	0.06191	0.13612	0.21026	3.44919*	4.38557	10.27759*
19	0.29660	4.47882*	3.72936	7.96429*	0.14484	2.10460*	0.20676	0.42486	0.30913	4.75190*	4.69470	10.20583*
20	0.17431	3.09407*	3.90367	9.70284*	0.07909	1.38513	0.28585	0.70097	0.18509	3.12864*	4.87979	11.54996*
21	0.11140	1.78889	4.01507	8.94139*	0.02270	0.36148	0.30855	0.68139	0.13895	2.19040*	5.01875	10.97093*
22	0.16099	2.92148*	4.17606	10.40929*	0.04242	0.75604	0.35097	0.85920	0.18923	3.25774*	5.20798	12.31564*
23	0.13420	2.20351*	4.31026	9.63082*	-0.00651	-0.10286	0.34445	0.74008	0.15625	2.51891*	5.36423	11.76782*
24	0.07147	1.05918	4.38173	8.75602*	-0.00482	-0.06731	0.33963	0.63924	0.10196	1.48988	5.46619	10.77014*
25	0.05372	0.87210	4.43546	9.62159*	-0.03864	-0.60308	0.30099	0.62777	0.07995	1.28897	5.54614	11.94833*
26	0.06336	1.17317	4.49881	11.03378*	0.04336	0.75745	0.34435	0.79673	0.09600	1.70145	5.64215	13.24446*
27	0.00415	0.06715	4.50297	9.56004*	0.00938	0.15220	0.35373	0.75384	0.02467	0.39921	5.66682	12.04036*
28	-0.02068	-0.32022	4.48229	9.03504*	-0.01583	-0.23923	0.33790	0.66483	-0.01297	-0.19912	5.65384	11.29692*
29	0.03980	0.81083	4.52209	11.89332*	-0.02771	-0.55004	0.31020	0.79500	0.05024	0.93690	5.70409	13.73140*
30	-0.01831	-0.36964	4.50378	11.64267*	-0.03009	-0.58771	0.28010	0.70048	0.01750	0.32781	5.72159	13.72072*

Note: ** Indicates Statistically Significant At 5% Level of Significance.*

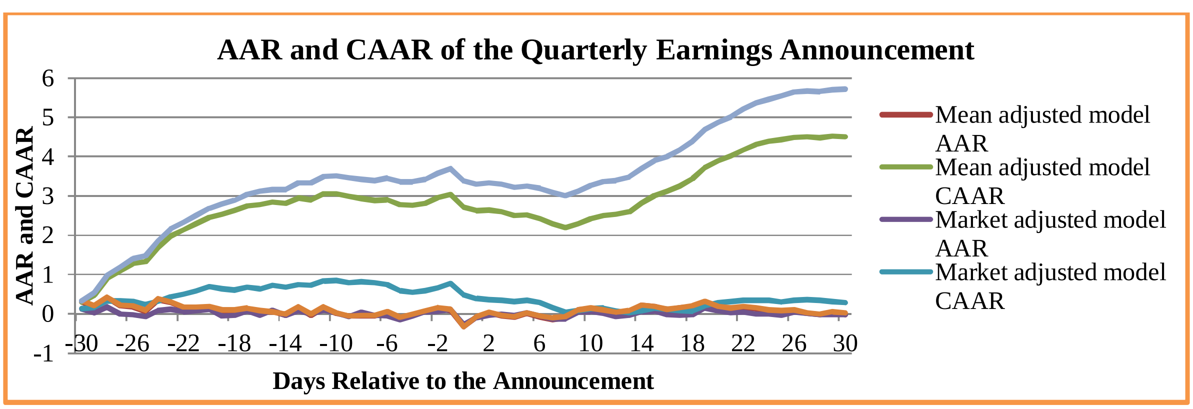

Figure 3 *Aars And Caars Trends of three Models Over the 61-Day Event Window of Bad News Earnings Announcement of September 2012 Quarter*

Table 4 *Runs and Sign Test Statistics of September 2012 Quarter*

	Mean adjusted model		Market adjusted model		Market model	
	Runs Statistics	Sign statistics	Runs Statistics	Sign statistics	Runs Statistics	Sign statistics
Good News Earnings Announcement						
Before	-2.9729	4.9934	0.4795	2.4327	-2.9729	7.2981
After	-1.9136	3.6515	-0.5427	1.4606	-1.9136	4.7469
Overall	-3.4569	3.4125	0.4074	1.9757	-3.4569	5.5678
Bad News Earnings Announcement						
Before	-1.4684	3.7131	0.3982	-0.3841	-1.4684	3.9691
After	-4.1891	2.9212	-1.2742	0.7303	-4.1891	2.9212
Overall	-4.5182	2.3349	-1.4047	-1.2572	-3.9934	2.6941
Full Sample Earnings Announcement						
Before	-2.9729	3.7131	-1.0348	3.2009	-2.9729	6.5299
After	-3.4512	3.2863	0.1888	2.5560	-3.4512	4.7469
Overall	-4.4969	1.9757	-0.3692	1.9757	-3.9518	4.4901

Notes:
1. Before: Number of Runs, Run Statistics, and Sign Statistics before the event day.
2. After: Number of Runs, Run Statistics, and Sign Statistics after the event day.
3. Overall: Number of Runs, Run Statistics, and Sign Statistics for the event window (-30 through 30 days.)
4. If the Run and Sign test statistics is greater than the critical value of ± 1.96, the relevant AAR is statistically significant at 5% level of Significance.

It is observed that the AARs of mean adjusted model and market model of all the portfolios are significant for overall period and therefore, we reject the null hypothesis that AARs occur randomly at 5% level of significance for the entire event window. Whereas, the result of market adjusted model shows that AARs are insignificant for all the portfolios in the event window of 61 days. Therefore we accept that AARs are random under this model. The sign statistics shows significant values for overall period for all models and for all the portfolios except for bad news of market adjusted portfolio. Therefore we conclude that there is a significant difference between the number of positive and negative AARs.

The estimated beta and R^2 from market model are presented in table 5. The average betas are negatively changed for all the length intervals except first two days. The first pass beta ranges from 0.8277 to 1.2587 during the pre-event and from 0.8956 to 0.9997 for the post-event period. Using one day return interval betas rise to 8.46%. With two days interval, betas rise 4.44%, 5th day interval fall to -15.43%, 10th day interval fall to -14.31%, 15th day interval fall to -19.80%, and on 20th day interval fall to -20.58%. The proportionate decrease in beta shows poor price adjustment on the quarterly earnings announcement and indicates poor market quality. The price efficiency is observed by R^2 in the market model regression. In the case of R^2, positive change is observed for 2nd to 8th and 19th day. The remaining days, R^2 are negatively changed The R^2 values ranges from 0.1183 to 0.4000 for the pre event period and from 0.1054 to 0.3805 for the post event period. The highest positive change of 36.71% is observed on the 3rd day interval period. The R^2 values are decreased proportionately during the post event period which is not expected in the study. This shows price inefficiency. The table 6 shows the result of second pass beta. The average BETA2 parameter should be less negative when market frictions are less. So, we expect a positive change in BETA2 during the earnings announcement. The BETS2 are positively changed for all intervals. The BETA2 are negatively signed in the post event period and this shows less market frictions in the market.

Table 5 *The Results Of First Pass Beta And R Square Coefficients*

Length Intervals	Beta						R Square					
	Pre-Event		Post-Event		Change in Beta	% Change in Beta	Pre-Event		Post-Event		Change in R Square	% Change in R Square
	Average	STDEV	Average	STDEV			Average	STDEV	Average	STDEV		
1	0.827682	0.838831	0.897727	0.793018	0.070045	8.46%	0.118338	0.163815	0.105425	0.139608	-0.01291	-10.91%
2	0.870697	1.045266	0.909365	0.81081	0.038669	4.44%	0.128418	0.170482	0.163685	0.178369	0.035268	27.46%
3	0.943399	1.100731	0.9208	0.866205	-0.0226	-2.40%	0.15118	0.183446	0.206681	0.204398	0.055501	36.71%
4	1.021489	1.200426	0.91397	0.906984	-0.10752	-10.53%	0.184057	0.201067	0.24172	0.225029	0.057663	31.33%
5	1.076822	1.350808	0.910645	0.917793	-0.16618	-15.43%	0.209599	0.220005	0.268652	0.239493	0.059054	28.17%

6	1.105882	1.464644	0.90275	0.940817	-0.20313	-18.37%	0.237606	0.237043	0.284261	0.251785	0.046655	19.64%
7	1.127962	1.60841	0.895567	0.969874	-0.2324	-20.60%	0.260086	0.255901	0.291978	0.261065	0.031892	12.26%
8	1.13945	1.658023	0.901409	1.003581	-0.23804	-20.89%	0.286468	0.26779	0.300205	0.266662	0.013737	4.80%
9	1.129095	1.796999	0.917677	1.051684	-0.21142	-18.72%	0.308904	0.279581	0.308076	0.271919	-0.00083	-0.27%
10	1.075441	1.801515	0.921501	1.116738	-0.15394	-14.31%	0.317237	0.284803	0.313425	0.274846	-0.00381	-1.20%
11	1.085194	2.01384	0.922259	1.202697	-0.16294	-15.01%	0.343639	0.301031	0.316225	0.277756	-0.02741	-7.98%
12	1.102469	2.028577	0.929189	1.317237	-0.17328	-15.72%	0.356608	0.307923	0.324643	0.282535	-0.03197	-8.96%
13	1.204151	2.073018	0.930631	1.430201	-0.27352	-22.71%	0.380635	0.314827	0.333335	0.285584	-0.0473	-12.43%
14	1.1888	1.886015	0.933138	1.5219	-0.25566	-21.51%	0.371231	0.313168	0.343927	0.289668	-0.0273	-7.35%
15	1.174322	1.770835	0.941801	1.570472	-0.23252	-19.80%	0.377227	0.316201	0.35193	0.292833	-0.0253	-6.71%
16	1.133324	1.67568	0.958364	1.599966	-0.17496	-15.44%	0.379323	0.315672	0.361067	0.296953	-0.01826	-4.81%
17	1.159177	1.792063	0.972781	1.647167	-0.1864	-16.08%	0.399966	0.327103	0.370475	0.299625	-0.02949	-7.37%
18	1.182339	1.877758	0.986071	1.689155	-0.19627	-16.60%	0.395601	0.328712	0.375694	0.301887	-0.01991	-5.03%
19	1.158908	1.934969	0.996834	1.730566	-0.16207	-13.99%	0.373434	0.329083	0.380513	0.305938	0.007078	1.90%
20	1.258746	2.464841	0.999715	1.775405	-0.25903	-20.58%	0.382013	0.339925	0.380087	0.306541	-0.00193	-0.50%

Table 6 *The Results of Second Pass Beta Coefficients*

Length Intervals	Pre Event	Post Event	Difference
5	-0.45211	-0.03294	0.419171
10	-0.56201	-0.01525	0.546765
15	-0.6017	-0.04281	0.55889
20	-0.63303	-0.10709	0.52594

7. Conclusion

This empirical study examines the abnormal performance of sample securities by using mean adjusted model, market adjusted model and market model. The paper investigated the information content in security prices on the release of quarterly earnings announcement by using event study and Cohen et al. (1983 a) methodology . Based on the percentage change in the current and corresponding quarter's net profit and net sales, the whole sample is divided into good news and bad news portfolios. The result of the number of positive and negative AARs and CAARs show that there are more numbers of positive values than negative values during the event window of 61 days. This result shows that market has positively reacted on the release of the September 2012 quarterly earnings announcement. These results are tested using the non-parametric tests. We tested the randomness in the behavior of AAR values using Runs test and found that the observed excess return series are not random during the event window of 61 days for mean adjusted model and market model. The sign statistics shows significant values for overall period for all models and for all the portfolios except for bad news of market adjusted portfolio. Therefore, we conclude that there is a significant difference between the number of positive and negative AAR. The t test results of the study show that AARs and CAARs values are significant for majority of the days in the event window of 61 days. Therefore, we reject the hypothesis that AAR and CAAR values are close to zero. The exception to this conclusion seems to be the bad news portfolio as their values are insignificant for the market adjusted model. The result from Cohen et al. (1983a) methodology shows poor price adjustments process as the value of beta are decreased proportionately. The R^2 values are also decreased proportionately during the post event period and this shows poor price efficiency. The BETA2 are negatively signed in the post event period. Based on overall results, we conclude that there is a scope for abnormal profits for the investors since the market fail to incorporate the new information in security prices. The above discussion clearly shows that the Indian stock market fails to perceive information content in security prices when they are publicly available as discussed by Fama (1965, 1970). The quarterly earnings information can generate significant abnormal profits to the trades in Indian stock market.

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