Share Price Response to Quarterly Earnings Announcements - A Study of BSE-500

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Company's earnings announcements are of oblivious importance for investors and are closely watched events as it reflects the company performance. The study examined the response of Quarterly Earnings announcement information on the stocks constituting the BSE-500. Using the event study method, the speed of reaction of the market to quarterly earnings information releases for a sample of 500 firms listed on the exchange is tested. The results show that the Indian capital market is semi-strong inefficient as abnormal returns have been observed both prior to and after the announcement.

Keywords: earnings announcements, abnormal returns, semi-strong form of market efficiency, company performance.

1. Introduction

Accounting earnings information is one of the widely used measures to analyse the firm-specific performance. As earnings information provides an indication for potential growth, investors use this information for generating abnormal gain as the market widely reacts to this kind of news. Further, the earnings are considered as the measure to evaluate the management's competence in smooth running of a business and creating value to the shareholders. Traders identify and capture arbitrage opportunities connected with the earnings announcement information and study the factors contribute to the abnormal returns. It enhances the investors' confidence about the company. The stock market reaction to earnings announcement has been studied in finance literature for more than 30 years. The empirical studies show that market strongly reacts to positive earnings news than to negative earnings (Ball and Brown (1968), Beaver (1968), and Rendleman et al. (1982). The above interpretation has been the subject of considerable debate since 1965. Fama (1965) formally developed Efficient Market Hypothesis (EMH) theory which states that prices adjust rapidly and accurately to new information and the traders cannot gain abnormal profits based on new information flow. According to Allen, Brealey and Myers (2011) market is efficient when it is not possible to earn higher return than market return. In other words, the price of shares reflects the fair worth of the company and is equivalent to the potential cash flows discounted by an alternative cost of capital. Eakins and Mishkin (2012) argued that an efficient market is one where asset prices fully reflect all available information. Generally, the essence of an efficient market is twofold 1). Quickly adjusting the new information in security prices and 2). Zero abnormal return. Many researchers empirically tested its validity. It has been observed and empirically proved that emerging markets like India are regarded as low liquid, thin trading, less informed investors and considerable volatile markets. But in recent past the Indian capital market is experienced a rapid growth in terms market capitalization, trade volume and upgraded with new technology. India has opened up for foreign investors and quiet heterogeneous in their size and accessibility. The significance of the EMH is subject for discussion in modern finance as the theory is half true (Shiller (2013). The development of capital market changed the relevance and validity of EMH theory because the flow of information and trading execution is faster than ever and at the same time they are not free of cost. Being this is the situation Indian capital market should characterize the evidence as a striking reflection of market efficiency.

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), Wooldridge (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 2013. On the basis of data availability we have selected 470 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 208 companies as good news portfolio, 262 companies as bad news portfolio and 470 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).

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

Where

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

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

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.

$$\mu_r = \left(\frac{2n_1n_2}{n_1 + n_2}\right) + 1$$

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. (1983 a) Methodology

Cohen et al. (1983a,) recognized that inaccuracies in the price discovery process drive security prices away from their intrinsic value, causing non synchronous 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.

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

Where, $R_{ijkt}$is the return to stock *i* on day *t*, for return interval *j*, using the *k* sample periods (*k* has avalue 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.

$b_{j,1LE} = a_{j,2} + b_{j,2}\ln(1 + L^{-1}) + C_{j,2}\left(Dummy_{jE} * \ln(1 + L^{-1})\right) + e_{jLH}$---------------- (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 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 present the AAR and CAAR values of full sample earnings announcement of mean adjusted model, market adjusted model and market model of September -2013 quarter. In the case of mean adjusted model, the AAR values are positive and significant for -28, -27, -26, -25, -24, -23, -22, -19, -18, -17, -16, -15, -14, -13, -9, -8, -7, -6, -5, -4, 0, 2, 3, 4, 9, 10, 11, 14, 15, 18, 24, 25, 26, 27, 28; positive and insignificant on -30, -29, -21, -20, -11, -10, -3, -2, -1, 1, 5, 12, 13, 16, 17, 19, 20, 21, 22, 29; negative and significant on 7th day and negative and insignificant on -12, 6, 8, 23rd and 30th day in the event period. Overall, the AARs are positive for 55 days and negative for 6 days and significant for 36 days and insignificant for 25 days during the event window of 61 days. The CAARs are positive and significant throughout the event period except on -30th day 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 -16, -7, -6, -4, 3, 4, 14, 18; positive and insignificant on -30, -27, -25, -23, -20, -19, -17, -15, -14, -13, -9, -8, -5, -3, -2, -1, 0, 2, 5, 6, 7, 8, 9, 10, 12, 13, 15, 17, 20, 21, 22, 24, 26, 27, 28; negative and significant on -12th day and negative and insignificant on -29, -28, -26, -24, -22, -21, -18, -11, -10, 1, 11, 16, 19, 23, 25, 29th and 30th day in the event window of 61 days. Of the 61 days event window, AARs are positive for 43 days and negative for 18 days and significant for 9 days and insignificant for 52 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, -16, -15, -14, -13, -7, -6, -5, -4, -3, 0, 1, 29, 30; positive and significant on -2, -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 and negative and insignificant on -28, -27, -26, -25, -24, -23, -22, -21, -20, -19, -18, -17, -12, -11, -10, -9th and -8th day in the event period. Overall, the CAARs are significant for 29 days and insignificant for 32 days in the event period. Therefore, we infer that CAARs are close to zero. When we observe market model, AARs are positive and insignificant for-30, -29, -26, -25, -24, -23, -22, -21, -20, -19, -18, -15, -13, -12, -11, -10, -5, -4, -3, -2, -1, 0, 1, 2, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29; positive and significant on -28, -27, -17, -16, -14, -9, -8, -7, -6, 3, 10 and negative and insignificant on 30th day in the event window. Overall, the AARs are positive for 60 days and negative for 1 day and significant for 11 days and insignificant for 41 days for the event period. In the case of CAARs, they are positive and significant for the 60 days in the event window of 61 days.

Table 1 *AAR and CAAR Values of Full Sample Earnings Announcements of September - 2013 Quarter*

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	0.08296	1.70427	0.08296	1.70427	0.01992	0.40205	0.01992	0.40205	0.26428	1.54905	0.26428	1.54905
-29	0.09888	1.68974	0.18184	2.19722*	-0.01469	-0.24521	0.00523	0.06170	0.28240	1.62412	0.54668	2.22318*
-28	0.17087	3.50352*	0.35271	4.17540*	-0.03520	-0.70134	-0.02997	-0.34476	0.35033	2.05692*	0.89702	3.04070*
-27	0.19901	3.93388*	0.55173	5.45296*	0.00787	0.14960	-0.02210	-0.20996	0.38092	2.22188*	1.27794	3.72707*
-26	0.09809	2.00777*	0.64982	5.94850*	0.00000	-0.00001	-0.02210	-0.19207	0.28212	1.65241	1.56005	4.08645*
-25	0.13016	2.54551*	0.77997	6.22746*	0.01793	0.34229	-0.00416	-0.03245	0.30890	1.80117	1.86896	4.44892*
-24	0.10277	2.15698*	0.88275	7.00248*	-0.05602	-1.13261	-0.06019	-0.45991	0.28215	1.65441	2.15111	4.76728*
-23	0.14887	2.99708*	1.03162	7.34279*	0.01882	0.36896	-0.04137	-0.28682	0.32489	1.89855	2.47600	5.11552*
-22	0.09592	2.04183*	1.12754	8.00041*	-0.01564	-0.32474	-0.05701	-0.39466	0.27414	1.61484	2.75014	5.39998*
-21	0.03071	0.65949	1.15825	7.86551*	-0.03533	-0.72169	-0.09234	-0.59651	0.20740	1.21851	2.95754	5.49474*
-20	0.08666	1.74661	1.24491	7.56499*	0.04804	0.94525	-0.04429	-0.26274	0.26775	1.56281	3.22529	5.67613*
-19	0.09714	2.24322*	1.34205	8.94648*	0.02092	0.46768	-0.02337	-0.15085	0.27736	1.64605	3.50265	6.00079*
-18	0.11170	2.44823*	1.45375	8.83754*	-0.05393	-1.10873	-0.07730	-0.44079	0.29225	1.71265	3.79490	6.16800*
-17	0.17811	4.00399*	1.63186	9.80434*	0.05573	1.22710	-0.02157	-0.12690	0.36047	2.13009*	4.15537	6.56254*
-16	0.21034	4.58670*	1.84220	10.37225*	0.10780	2.29081*	0.08623	0.47316	0.39168	2.31019*	4.54705	6.92476*
-15	0.13913	3.31793*	1.98133	11.81215*	0.00453	0.10591	0.09076	0.53027	0.31723	1.87595	4.86428	7.19118*
-14	0.16367	3.78830*	2.14500	12.04168*	0.03022	0.64917	0.12099	0.63030	0.34040	2.01211*	5.20469	7.46153*
-13	0.13578	3.16668*	2.28078	12.53755*	0.00225	0.05082	0.12323	0.65681	0.31828	1.87232	5.52296	7.65796*
-12	-0.04075	-0.97489	2.24003	12.29414*	-0.14037	-3.23746*	-0.01714	-0.09068	0.14160	0.83839	5.66456	7.69437*
-11	0.08562	1.86332	2.32565	11.31685*	-0.01463	-0.30961	-0.03177	-0.15030	0.26031	1.52784	5.92487	7.77605*
-10	0.01854	0.43784	2.34420	12.07869*	-0.07835	-1.84675	-0.11012	-0.56642	0.19976	1.18215	6.12463	7.90914*
-9	0.17215	3.98822*	2.51635	12.42881*	0.01196	0.26621	-0.09816	-0.46591	0.35455	2.08956*	6.47918	8.14124*
-8	0.25862	5.57695*	2.77497	12.47744*	0.02009	0.43344	-0.07807	-0.35113	0.43818	2.60714*	6.91735	8.58204*
-7	0.31712	5.85550*	3.09209	11.65431*	0.13783	2.40597*	0.05976	0.21295	0.49411	2.88164*	7.41146	8.82297*
-6	0.22605	4.87936*	3.31814	14.32452*	0.12874	2.65585*	0.18850	0.77774	0.40657	2.40889*	7.81803	9.26416*
-5	0.14544	3.02799*	3.46358	14.14159*	0.08489	1.73121	0.27339	1.09347	0.32373	1.90862	8.14177	9.41379*
-4	0.14221	2.76067*	3.60579	13.47143*	0.15975	2.86554*	0.43314	1.49525	0.31148	1.84493	8.45324	9.63600*
-3	0.06888	1.43273	3.67467	14.44504*	0.08961	1.76542	0.52275	1.94628	0.24857	1.46131	8.70181	9.66780*
-2	0.02395	0.50264	3.69862	14.41308*	0.08641	1.75187	0.60916	2.29343*	0.20303	1.19839	8.90484	9.76033*
-1	0.04981	0.93859	3.74843	12.89533*	0.07034	1.31168	0.67950	2.31327*	0.21950	1.27910	9.12434	9.70778*
0	0.14346	2.00732*	3.89189	9.78085*	0.12234	1.66088	0.80184	1.95509	0.31805	1.79706	9.44239	9.58228*
1	0.01736	0.24941	3.90925	9.92941*	-0.06966	-0.97653	0.73218	1.81434	0.18889	1.06770	9.63128	9.62391*
2	0.11528	2.21003*	4.02453	13.43041*	0.00731	0.13550	0.73949	2.38631*	0.28881	1.69476	9.92009	10.13331*
3	0.17059	3.60771*	4.19512	15.21560*	0.11380	2.32293*	0.85329	2.98719*	0.34659	2.05174*	10.26667	10.42319*
4	0.10587	2.10671*	4.30099	14.46607*	0.09987	2.00513*	0.95315	3.23485*	0.27564	1.62396	10.54232	10.49865*
5	0.05499	1.01199	4.35599	13.35985*	0.09800	1.78253	1.05115	3.18656*	0.23339	1.35525	10.77570	10.42895*
6	-0.01483	-0.29977	4.34115	14.42428*	0.01841	0.37647	1.06957	3.59501*	0.16318	0.95257	10.93888	10.49813*

7	-0.09620	-2.02833*	4.24495	14.51920*	0.01457	0.29150	1.08413	3.51930*	0.08319	0.48777	11.02207	10.48316*
8	-0.07355	-1.49974	4.17140	13.62008*	0.01954	0.38210	1.10368	3.45511*	0.10530	0.61775	11.12737	10.45314*
9	0.11390	2.07402*	4.28530	12.33770*	0.06789	1.29794	1.17156	3.54172*	0.28193	1.64324	11.40930	10.51454*
10	0.18639	3.81433*	4.47170	14.29112*	0.09348	1.89769	1.26504	4.01089*	0.36770	2.15874*	11.77700	10.79821*
11	0.11300	1.99671*	4.58470	12.50039*	-0.00908	-0.16773	1.25595	3.57811*	0.28657	1.64292	12.06357	10.67158*
12	0.05329	0.89977	4.63799	11.94257*	0.00856	0.16188	1.26452	3.64477*	0.21819	1.23990	12.28177	10.64322*
13	0.10558	1.80699	4.74357	12.23938*	0.10325	1.88704	1.36777	3.76848*	0.27626	1.59810	12.55803	10.95156*
14	0.10781	2.40159*	4.85137	16.11066*	0.09611	2.11349*	1.46388	4.79871*	0.28035	1.65618	12.83838	11.30616*
15	0.09274	2.00567*	4.94411	15.76511*	0.00130	0.02796	1.46518	4.66248*	0.27283	1.60070	13.11121	11.34183*
16	0.02231	0.29982	4.96642	9.73497*	-0.08317	-1.22461	1.38201	2.96833*	0.15483	0.80473	13.26604	10.05750*
17	0.06273	1.10781	5.02916	12.81906*	0.00376	0.06938	1.38578	3.68694*	0.19809	1.15661	13.46413	11.34698*
18	0.15303	2.96180*	5.18219	14.32814*	0.10458	2.09606*	1.49036	4.26729*	0.33368	1.94822	13.79780	11.50866*
19	0.02069	0.41798	5.20288	14.86185*	-0.03292	-0.71906	1.45744	4.50251*	0.19214	1.12288	13.98994	11.56239*
20	0.03651	0.84317	5.23939	16.94424*	0.02311	0.52429	1.48055	4.70283*	0.21991	1.30771	14.20985	11.83257*
21	0.01983	0.45062	5.25921	16.57633*	0.01413	0.33107	1.49468	4.85725*	0.20746	1.22660	14.41731	11.82067*
22	0.03773	0.90283	5.29694	17.41190*	0.00673	0.16033	1.50141	4.91437*	0.21054	1.24506	14.62785	11.88221*
23	-0.01160	-0.14910	5.28534	9.24411*	-0.08032	-1.05553	1.42108	2.54126*	0.11515	0.59531	14.74300	10.37233*
24	0.13149	2.74247*	5.41683	15.23436*	0.00417	0.08869	1.42525	4.08727*	0.30877	1.81115	15.05177	11.90493*
25	0.09777	2.02745*	5.51460	15.28074*	-0.07173	-1.43549	1.35353	3.61987*	0.27795	1.62436	15.32972	11.97162*
26	0.13240	2.42538*	5.64700	13.70205*	0.01761	0.33137	1.37113	3.41830*	0.30299	1.74594	15.63272	11.93146*
27	0.13591	2.90689*	5.78291	16.24080*	0.04677	0.98972	1.41790	3.93966*	0.30672	1.81321	15.93944	12.37252*
28	0.13918	3.40331*	5.92209	18.85274*	0.07101	1.65394	1.48892	4.51477*	0.30850	1.85268	16.24794	12.70332*
29	0.01327	0.05337	5.93536	3.08212*	-0.01017	-0.03963	1.47874	0.74351	0.13294	0.38425	16.38088	6.11263*
30	-0.00979	-0.08066	5.92556	6.24956*	-0.05521	-0.53147	1.42353	1.75467	-0.08036	-0.20041	16.30052	5.20473*

Note: * indicates Statistically Significant at 5% level of Significance

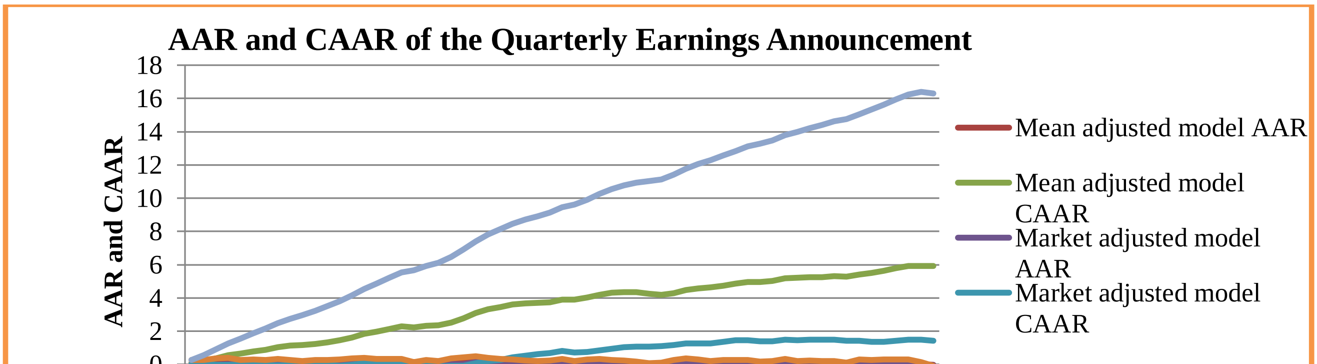

Figure 1 *AARs and CAARs Trends of Three Models Over the 61-Day Event Window of Full Sample Earnings Announcement of September 2013 Quarter*

Table 2 reports the results of good news earnings announcement of September 2013 quarter. In the case of mean adjusted model, AARs are positive and insignificant for -24, -22, -21, -19, -18, -12, -5,-3, -2, 2, 4, 5, 8, 9, 11, 13, 14, 15, 16, 17, 18, 19, 22, 25, 26, 27, 28, 30; positive and significant on -30, -29, -28, -27, -26 -25, -23 -20, -17, -16, -15, -14, -13, -11, -9, -8, -7, -6, -4, -1, 0, 1, 3, 10, 21, 24; negative and significant for 7th day and negative and insignificant on -10, 6, 12, 20, 23rd and 29th day in the event period. The AARs are positive for 55 days and negative for 6 days and significant for 36 days and insignificant for 25 days in the entire event window. Therefore, we infer that AARs are not close to zero. The CAARs are positive and significant for the 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, -18, -14, -12, -10, -8, 7, 11, 12, 16, 19, 20, 23, 25, 26, 29; positive and insignificant on -30, -29, -28, -27, -26, -25, -23, -22 -21, -20, -19, -17, -16, -15, -13, -11, -9, -7, -6, -5, -3, 2, 3, 4, 5, 6, 8, 9, 13, 14, 15, 17, 18, 22, 24, 27, 28, 30 and positive and significant on -4, -2, -1, 0, 1, 10 and 21st day in the event period. The result from overall window shows that AARs are positive for 43 days and negative for 18 days and insignificant for 52 days. Therefore, we accept the null hypothesis that AARs are close to zero. The CAARs are positive and significant for all the days except -30, -29, -28, -27, -24, 29th day in the window period. Therefore, we reject the null hypothesis that CAARs are close to zero. In the case of market model AARs are positive and insignificant throughout the window period. Therefore, we infer that AARs are close to zero. The CAARs are positive and significant for all the days except on -30th day in the window period of 61 days. Therefore, we reject the null hypothesis that CAARs are close to zero.

Table 2 *AAR and CAAR Values of Good News Earnings Announcements of September – 2013 Quarter*

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	0.13407	2.10423*	0.13407	2.10423*	0.06477	0.97962	0.06477	0.97962	0.54944	1.49322	0.54944	1.49322
-29	0.22786	2.63757*	0.36194	2.96244*	0.10226	1.16162	0.16703	1.34167	0.64213	1.72226	1.19157	2.25986*
-28	0.18722	2.54587*	0.54915	4.31147*	0.00062	0.00831	0.16765	1.30129	0.59397	1.60305	1.78554	2.78221*
-27	0.25738	3.19803*	0.80653	5.01069*	0.08793	0.99637	0.25559	1.44800	0.66850	1.80285	2.45404	3.30911*
-26	0.19111	2.54979*	0.99764	5.95274*	0.13629	1.67329	0.39188	2.15164*	0.60644	1.63960	3.06048	3.70044*
-25	0.17961	2.17976*	1.17725	5.83270*	0.09450	1.13908	0.48638	2.39338*	0.58293	1.56637	3.64341	3.99677*
-24	0.06391	0.80088	1.24116	5.87863*	-0.09178	-1.14925	0.39460	1.86760	0.46835	1.25981	4.11177	4.18034*
-23	0.20596	3.01973*	1.44712	7.50160*	0.11211	1.48853	0.50671	2.37872*	0.60741	1.64431	4.71918	4.51670*
-22	0.08105	1.06602	1.52817	6.69983*	0.02931	0.37928	0.53602	2.31194*	0.48238	1.30473	5.20156	4.68965*
-21	0.06899	0.88844	1.59716	6.50395*	0.04993	0.63832	0.58594	2.36903*	0.46771	1.25918	5.66926	4.82663*
-20	0.15262	1.96854	1.74978	6.80495*	0.12359	1.53795	0.70954	2.66216*	0.56072	1.51054	6.22999	5.06028*
-19	0.08991	1.40537	1.83969	8.30068*	0.00512	0.07624	0.71465	3.07368*	0.50213	1.35992	6.73211	5.26335*
-18	0.07739	1.12632	1.91708	7.73819*	-0.08341	-1.14737	0.63125	2.40845*	0.48946	1.32144	7.22158	5.40741*
-17	0.15040	2.07672*	2.06748	7.62968*	0.09808	1.33992	0.72932	2.66297*	0.56641	1.52857	7.78799	5.61715*
-16	0.15281	2.01625*	2.22029	7.56426*	0.06022	0.77261	0.78955	2.61529*	0.56188	1.51818	8.34987	5.82523*
-15	0.15314	2.36549*	2.37343	9.16524*	0.01379	0.21320	0.80334	3.10492*	0.55877	1.51350	8.90863	6.03259*
-14	0.14811	2.19645*	2.52154	9.06922*	-0.00234	-0.03262	0.80100	2.71235*	0.54813	1.48803	9.45676	6.22655*
-13	0.17436	2.66802*	2.69591	9.72310*	0.04226	0.63094	0.84327	2.96734*	0.58553	1.58009	10.04230	6.38741*
-12	0.03619	0.55785	2.73209	9.66264*	-0.06864	-0.99471	0.77462	2.57532*	0.44977	1.21980	10.49206	6.52811*
-11	0.15406	2.12003*	2.88615	8.88118*	0.06610	0.89473	0.84072	2.54483*	0.55259	1.49354	11.04465	6.67506*
-10	-0.02090	-0.30550	2.86525	9.14014*	-0.08159	-1.23522	0.75913	2.50780*	0.38607	1.04599	11.43072	6.75810*
-9	0.20432	3.24698*	3.06957	10.39986*	0.06838	1.03768	0.82751	2.67710*	0.61466	1.66618	12.04538	6.96136*
-8	0.19532	2.77415*	3.26489	9.66933*	-0.05181	-0.76191	0.77570	2.37853*	0.60616	1.64743	12.65155	7.16963*
-7	0.31219	4.01277*	3.57708	9.38525*	0.13529	1.69026	0.91099	2.32324*	0.71805	1.93381	13.36959	7.34975*
-6	0.21678	3.26148*	3.79386	11.41576*	0.11155	1.63170	1.02255	2.99133*	0.62961	1.70618	13.99920	7.58730*
-5	0.12871	1.94370	3.92257	11.61704*	0.06219	0.96927	1.08474	3.31544*	0.53714	1.45569	14.53634	7.72592*
-4	0.18742	2.40668*	4.11000	10.15672*	0.19545	2.28593*	1.28019	2.88147*	0.58653	1.58530	15.12287	7.86632*
-3	0.10936	1.62812	4.21935	11.87158*	0.13911	1.94864	1.41930	3.75721*	0.52095	1.40767	15.64382	7.98858*
-2	0.08106	1.27713	4.30042	12.58108*	0.14178	2.10218*	1.56108	4.29823*	0.49399	1.34176	16.13781	8.13965*
-1	0.19211	2.51580*	4.49253	10.74147*	0.19596	2.51048*	1.75705	4.10961*	0.58848	1.58284	16.72629	8.21383*
0	0.28223	2.66925*	4.77476	8.11053*	0.28274	2.62442*	2.03978	3.40056*	0.69191	1.83772	17.41820	8.30907*
1	0.27457	2.48372*	5.04933	8.07430*	0.25768	2.26429*	2.29746	3.56888*	0.67585	1.78708	18.09405	8.45777*
2	0.15347	1.95138	5.20280	11.51584*	0.08773	1.09597	2.38519	5.18694*	0.55840	1.50757	18.65244	8.76622*
3	0.15831	2.25464*	5.36112	13.09398*	0.11140	1.47705	2.49660	5.67674*	0.56050	1.52015	19.21295	8.93640*
4	0.12144	1.73986	5.48255	13.27736*	0.11139	1.57878	2.60798	6.24833*	0.51703	1.40083	19.72998	9.03576*
5	0.05410	0.62932	5.53666	10.73325*	0.08808	0.97771	2.69607	4.98758*	0.46470	1.24395	20.19468	9.00975*
6	-0.03103	-0.44012	5.50563	12.83800*	0.04496	0.60937	2.74102	6.10769*	0.38216	1.02962	20.57684	9.11392*
7	-0.19366	-3.32670*	5.31197	14.80263*	-0.02757	-0.44038	2.71346	7.03168*	0.21346	0.57712	20.79030	9.11852*
8	0.02369	0.28595	5.33566	10.31176*	0.15682	1.82665	2.87028	5.35357*	0.43014	1.15824	21.22045	9.14971*

9	0.11318	1.42800	5.44884	10.87029*	0.11569	1.45010	2.98597	5.91765*	0.51541	1.38679	21.73585	9.24713*
10	0.21199	2.81574*	5.66083	11.74254*	0.15690	1.98464*	3.14287	6.20869*	0.62418	1.68529	22.36004	9.42853*
11	0.10095	1.47297	5.76179	12.97193*	-0.01351	-0.19488	3.12935	6.96285*	0.51225	1.37902	22.87229	9.50107*
12	-0.01049	-0.19723	5.75130	16.49343*	-0.03870	-0.70146	3.09065	8.54270*	0.39971	1.09174	23.27200	9.69344*
13	0.00747	0.09310	5.75877	10.82221*	0.04803	0.60404	3.13868	5.95111*	0.40495	1.08827	23.67694	9.59264*
14	0.10121	1.53961	5.85997	13.28904*	0.11302	1.63503	3.25170	7.01239*	0.49836	1.34872	24.17530	9.75317*
15	0.10313	1.49381	5.96311	12.73468*	0.04815	0.66275	3.29985	6.69720*	0.51263	1.37896	24.68793	9.79162*
16	0.02274	0.37364	5.98585	14.34312*	-0.04023	-0.60764	3.25962	7.18114*	0.43180	1.17602	25.11973	9.97920*
17	0.02581	0.36863	6.01166	12.39266*	0.00013	0.00185	3.25975	6.64599*	0.38056	1.02838	25.50029	9.94620*
18	0.10095	1.40797	6.11261	12.17910*	0.04627	0.67563	3.30601	6.89702*	0.51973	1.40418	26.02002	10.04273*
19	0.05294	0.76699	6.16555	12.63329*	-0.03998	-0.57123	3.26604	6.60020*	0.45648	1.22857	26.47650	10.07763*
20	-0.01642	-0.24461	6.14913	12.82753*	-0.03261	-0.47508	3.23342	6.59526*	0.39907	1.08568	26.87556	10.23832*
21	0.13563	1.99512*	6.28476	12.82008*	0.16245	2.42529*	3.39588	7.03050*	0.56146	1.52563	27.43703	10.33859*
22	0.03334	0.50264	6.31810	13.08484*	0.02017	0.30444	3.41604	7.08331*	0.42351	1.14465	27.86054	10.34333*
23	-0.07109	-0.45957	6.24701	5.49582*	-0.12271	-0.79968	3.29334	2.92071*	0.26827	0.62774	28.12881	8.95698*
24	0.19240	2.49000*	6.43941	11.23721*	0.08347	1.10682	3.37681	6.03739*	0.59240	1.59557	28.72120	10.43099*
25	0.09567	1.35884	6.53508	12.40348*	-0.01987	-0.27993	3.35694	6.32075*	0.50484	1.35780	29.22604	10.50410*
26	0.08220	1.22136	6.61729	13.02245*	-0.00989	-0.15005	3.34705	6.72541*	0.49303	1.33112	29.71907	10.62779*
27	0.08566	1.25474	6.70294	12.89280*	0.00686	0.09640	3.35392	6.18603*	0.48240	1.30587	30.20147	10.73510*
28	0.10818	1.71955	6.81112	14.09522*	0.07214	1.07880	3.42606	6.66972*	0.49823	1.36784	30.69970	10.97262*
29	-0.09201	-0.21933	6.71912	2.06787*	-0.09065	-0.20845	3.33542	0.99023	0.17422	0.28906	30.87392	6.61305*
30	0.06095	0.97420	6.78007	13.87525*	0.00800	0.12714	3.34342	6.80320*	0.46395	1.25808	31.33787	10.88040*

Note: * Indicates Statistically Significant at 5% level of Significance

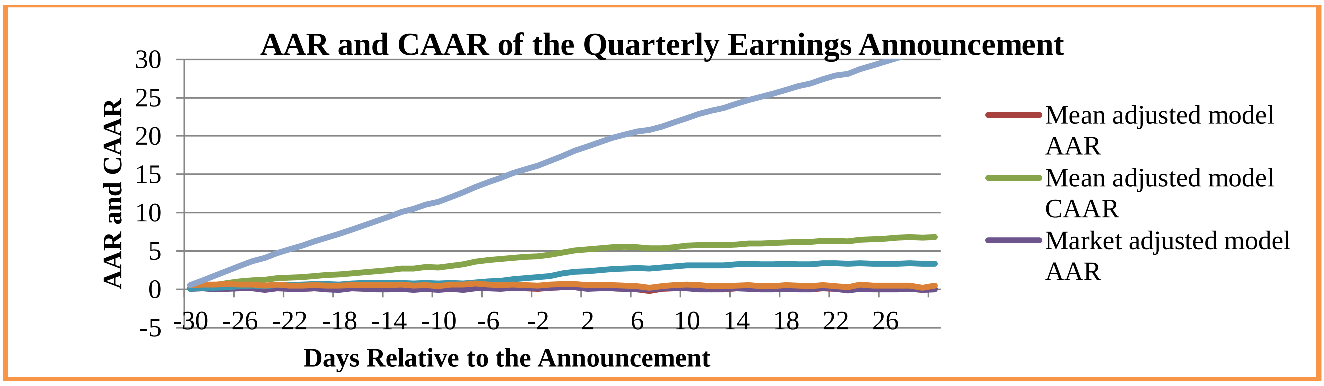

Figure 2 *AARs and CAARs Trends of Three Models over the 61-Day Event Window of Good News Earnings Announcement of September 2013 Quarter*

Table 3 present the AAR and CAAR values of bad sample earnings announcement of mean adjusted model; market adjusted model and market model of September -2013 quarter. In the case of mean adjusted model, the AARs are positive and significant for -28, -27, -24, -18, -17, -16, -15, -14 -9, -8, -7, -6, -5, 3, 10, 13, 18, 26, 27, 28; positive and insignificant on -30, -26, -25, -23, -22, -21, -20, -19, -13, -11, -10, -4, -3, 0, 2, 4, 5, 9, 11, 12, 14, 15, 16, 17, 20, 22, 23, 24, 25, 29; negative and significant on 1, 8 and negative and insignificant on -29, -12, -2, -1, 6, 7, 19, 21, 30th day in the event period. Of the 61 day event window, AARs are positive for 50 days and significant for 22 days in the event window of 61 days. It is further observed that the CAAR values are positive and significant on -27, -26, -25, -24, -23, -22, -21, -20, -19, -18, -17, -16, -15, -14, -13, -12, -11, -10, -9, -8, -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 and positive and insignificant on -30, -29 band -28th day. Therefore, we reject the null hypothesis that CAARs are close to zero. In the case of market adjusted model, the AAR values are positive and insignificant for -19, -17, -14, -8, -6, -5, -4, -3, -2, 3, 4, 5, 7, 9, 10, 12, 13, 14, 17, 18, 20, 26 27, 28, 29; positive and significant on -16, -7; negative and significant on -12, 1st day and negative and insignificant on -30, -29, -28, -27, -26, -25, -24, -23, -22, -21, -20, -18, -15, -13, -11, -10, -9, -1, 0, 2, 6, 8, 11, 15, 16, 19, 21, 22, 23, 24, 25 and 30th day. Overall, the AARs are positive for 27 days and negative for 34 days and significant for 4 days and insignificant for 57 days during the event window of 61 days. Therefore, we infer that AARs are close to zero. The CAARs are positive and insignificant on 14, 15, 18, 19, 20, 29; negative and significant on -26, -25, -24, -23, -22, -21, -20, -19, -18, -17, -16, -15, -12, -11, -10, -9, -8, -7th day and negative and insignificant on -30, -29, -28, -27, -14, -13, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 16, 17, 21, 22,23, 24, 25, 26, 27, 28, 30th day in the window period. The CAARs are positive for 55 days and insignificant for 43 days. Therefore, we accept the null hypothesis that CAARs are close to zero. When we observe market model, AARs are positive and insignificant for-30, -28, -27, -26, -25, -24, -23, -22, -21, -20, -19, -18, -15, -13, -11, -10, -9, -4, -3, 0, 2,4, 5, 9, 10, 11, 12, 13, 14, 15, 17, 20, 22, 24, 25, 26, 27, 29; positive and significant on -17, -16, -14, -8, -7, -6, -5, 3, 18, 28th day and negative and insignificant on -29, -12, -2, -1, 1, 6, 7, 8, 16, 19, 21, 23 and 30th day of the window period. Overall, the AARs are positive for 48 days and negative for 13 days and significant for 10 days and insignificant for 51 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 except on -30, -29, -28, -26 and 30th day and therefore, we infer that CAARs are not close to zero.

Table 3 *AAR and CAAR Values of Bad News Earnings Announcements of September – 2013 Quarter*

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	0.04238	0.59532	0.04238	0.59532	-0.01569	-0.21855	-0.01569	-0.21855	0.03790	0.42014	0.03790	0.42014
-29	-0.00351	-0.04441	0.03887	0.34767	-0.10754	-1.49840	-0.12323	-1.21407	-0.00319	-0.03533	0.03471	0.27210
-28	0.15789	2.41881*	0.19676	1.74027	-0.06363	-0.78203	-0.18686	-1.32591	0.15691	1.63357	0.19163	1.15179
-27	0.15268	2.36912*	0.34944	2.71116*	-0.05569	-0.81862	-0.24255	-1.78270	0.15261	1.85841	0.34424	2.09595*
-26	0.02424	0.37813	0.37368	2.60695*	-0.10820	-1.71387	-0.35075	-2.48460*	0.02463	0.28034	0.36887	1.87726
-25	0.09090	1.41278	0.46458	2.94789*	-0.04286	-0.65705	-0.39360	-2.46359*	0.09136	1.07302	0.46023	2.20684*
-24	0.13363	2.32604*	0.59820	3.93571*	-0.02764	-0.41288	-0.42124	-2.37838*	0.13433	1.58330	0.59456	2.64867*
-23	0.10355	1.46347	0.70175	3.50641*	-0.05525	-0.88868	-0.47649	-2.70991*	0.10060	1.24315	0.69516	3.03714*
-22	0.10773	1.82794	0.80948	4.57842*	-0.05132	-0.74348	-0.52781	-2.54878*	0.10882	1.21337	0.80398	2.98828*
-21	0.00032	0.00565	0.80980	4.53750*	-0.10301	-1.69299	-0.63082	-3.27860*	0.00075	0.00920	0.80472	3.13332*
-20	0.03430	0.53389	0.84410	3.96140*	-0.01193	-0.19273	-0.64275	-3.13054*	0.03516	0.44826	0.83988	3.22868*
-19	0.10288	1.74714	0.94698	4.64262*	0.03346	0.51447	-0.60929	-2.70419*	0.09892	1.15082	0.93880	3.15299*
-18	0.13893	2.27464*	1.08591	4.93101*	-0.03052	-0.50792	-0.63981	-2.95302*	0.13568	1.84532	1.07448	4.05298*
-17	0.20011	3.61045*	1.28602	6.20114*	0.02212	0.33751	-0.61769	-2.51940*	0.19698	2.31067*	1.27146	3.98614*
-16	0.25601	4.56551*	1.54203	7.10031*	0.14557	2.54703*	-0.47213	-2.13298*	0.25655	3.41883*	1.52802	5.25752*
-15	0.12801	2.32622*	1.67005	7.58685*	-0.00282	-0.04906	-0.47494	-2.06700*	0.12548	1.58649	1.65350	5.22634*
-14	0.17601	3.13497*	1.84606	7.97458*	0.05607	0.98083	-0.41887	-1.77715	0.17549	2.25729*	1.82899	5.70582*
-13	0.10515	1.85041	1.95121	8.09323*	-0.02952	-0.48202	-0.44839	-1.72574	0.10610	1.30699	1.93509	5.61848*
-12	-0.10183	-1.87463	1.84938	7.81070*	-0.19732	-3.34940*	-0.64571	-2.51456*	-0.10305	-1.29892	1.83204	5.29762*
-11	0.03130	0.53232	1.88068	7.15297*	-0.07873	-1.42930	-0.72444	-2.94097*	0.02827	0.37015	1.86031	5.44714*
-10	0.04986	0.93769	1.93054	7.92350*	-0.07577	-1.24054	-0.80021	-2.85893*	0.05185	0.62359	1.91216	5.01801*
-9	0.14661	2.47562*	2.07714	7.47790*	-0.03284	-0.59420	-0.83305	-3.21366*	0.14804	1.89846	2.06020	5.63268*
-8	0.30888	5.01786*	2.38602	8.08239*	0.07718	1.25997	-0.75587	-2.57301*	0.30481	3.71123*	2.36502	6.00416*
-7	0.32103	4.27341*	2.70706	7.35558*	0.13985	2.21440*	-0.61602	-1.99112*	0.31633	4.20558*	2.68134	7.27674*
-6	0.23341	3.62916*	2.94047	9.14390*	0.14239	1.76000	-0.47364	-1.17091	0.22951	2.61693*	2.91085	6.63816*
-5	0.15873	2.32154*	3.09920	8.88970*	0.10290	1.51231	-0.37073	-1.06853	0.15431	2.02344*	3.06516	7.88240*
-4	0.10631	1.54678	3.20550	8.97586*	0.13141	1.83019	-0.23933	-0.64150	0.09311	1.13231	3.15827	7.39153*
-3	0.03674	0.54171	3.24225	9.03348*	0.05031	0.68413	-0.18902	-0.48573	0.03233	0.44499	3.19060	8.30009*
-2	-0.02139	-0.30985	3.22086	8.66427*	0.04245	0.59539	-0.14657	-0.38176	-0.02796	-0.34339	3.16264	7.21300*
-1	-0.06316	-0.86773	3.15770	7.92109*	-0.02938	-0.41717	-0.17595	-0.45608	-0.07344	-0.89595	3.08920	6.88109*
0	0.03328	0.34475	3.19098	5.93673*	-0.00499	-0.06829	-0.18095	-0.44437	0.02124	0.25126	3.11044	6.60765*
1	-0.18684	-2.14913*	3.00414	6.10848*	-0.32954	-3.28839*	-0.51048	-0.90050	-0.19770	-1.88911	2.91274	4.92001*
2	0.08497	1.21769	3.08911	7.70663*	-0.05654	-0.64570	-0.56702	-1.12733	0.07479	0.76567	2.98753	5.32419*
3	0.18033	2.81566*	3.26944	8.75476*	0.11569	1.58760	-0.45133	-1.06213	0.17676	2.13795*	3.16429	6.56368*
4	0.09352	1.31304	3.36296	7.98122*	0.09072	1.40757	-0.36060	-0.94572	0.08401	1.07268	3.24830	7.01097*

5	0.05570	0.79855	3.41866	8.16877*	0.10587	1.51848	-0.25473	-0.60891	0.04974	0.60421	3.29804	6.67681*
6	-0.00197	-0.02858	3.41668	8.14131*	-0.00266	-0.03909	-0.25739	-0.62172	-0.01068	-0.12382	3.28736	6.26815*
7	-0.01883	-0.26455	3.39786	7.74460*	0.04802	0.73394	-0.20938	-0.51915	-0.02022	-0.23217	3.26714	6.08525*
8	-0.15075	-2.59343*	3.24710	8.94498*	-0.08944	-1.19807	-0.29881	-0.64095	-0.15259	-1.75648	3.11455	5.74077*
9	0.11448	1.50743	3.36158	6.99899*	0.02993	0.49273	-0.26888	-0.69985	0.09657	1.22213	3.21112	6.42522*
10	0.16607	2.58573*	3.52765	8.57784*	0.04312	0.62259	-0.22576	-0.50901	0.16408	1.87971	3.37520	6.03886*
11	0.12256	1.42809	3.65022	6.56277*	-0.00557	-0.08956	-0.23132	-0.57422	0.10741	1.30332	3.48261	6.52051*
12	0.10392	1.06599	3.75414	5.87258*	0.04609	0.57485	-0.18524	-0.35233	0.07409	0.70896	3.55670	5.19011*
13	0.18347	2.20869*	3.93760	7.14634*	0.14710	1.74638	-0.03814	-0.06826	0.17410	1.41002	3.73080	4.55511*
14	0.11305	1.84000	4.05065	9.82835*	0.08269	1.09968	0.04455	0.08832	0.10727	1.12690	3.83807	6.01048*
15	0.08449	1.35461	4.13514	9.77509*	-0.03590	-0.59373	0.00865	0.02109	0.08245	1.05240	3.92053	7.37792*
16	0.02197	0.17634	4.15711	4.86783*	-0.11725	-1.95824	-0.10860	-0.26457	-0.06506	-0.81849	3.85547	7.07550*
17	0.09204	1.08158	4.24915	7.20693*	0.00665	0.06045	-0.10196	-0.13380	0.05323	0.28860	3.90870	3.05868*
18	0.19438	2.65652*	4.44353	8.67548*	0.15087	1.89610	0.04892	0.08782	0.18597	2.06002*	4.09467	6.47976*
19	-0.00490	-0.07008	4.43863	8.97078*	-0.02731	-0.38422	0.02160	0.04298	-0.01771	-0.19669	4.07695	6.40215*
20	0.07853	1.39012	4.51715	11.19735*	0.06735	1.11163	0.08896	0.20559	0.07767	0.92304	4.15463	6.91359*
21	-0.07211	-1.26358	4.44504	10.80109*	-0.10363	-1.80936	-0.01467	-0.03552	-0.07357	-0.95711	4.08105	7.36222*
22	0.04121	0.77077	4.48625	11.52532*	-0.00394	-0.07288	-0.01861	-0.04726	0.04147	0.52432	4.12252	7.16031*
23	0.03563	0.53529	4.52188	9.24571*	-0.04668	-0.86484	-0.06529	-0.16461	-0.00641	-0.08469	4.11610	7.39610*
24	0.08313	1.37967	4.60501	10.30570*	-0.05879	-0.94966	-0.12407	-0.27026	0.08360	1.12937	4.19970	7.65009*
25	0.09944	1.50333	4.70445	9.50369*	-0.11290	-1.90533	-0.23697	-0.53443	0.09783	1.21747	4.29753	7.14671*
26	0.17224	2.09811*	4.87669	7.86821*	0.03943	0.56555	-0.19754	-0.37524	0.15213	1.81014	4.44966	7.01288*
27	0.17581	2.74614*	5.05250	10.36282*	0.07846	0.98386	-0.11908	-0.19608	0.16726	1.63174	4.61692	5.91435*
28	0.16379	3.04474*	5.21629	12.62383*	0.07011	1.10867	-0.04897	-0.10081	0.15787	2.01290*	4.77479	7.92578*
29	0.09685	0.32576	5.31314	2.30723*	0.05371	0.96061	0.00474	0.01095	0.10016	1.33321	4.87496	8.37679*
30	-0.06595	-0.31086	5.24718	3.16651*	-0.10539	-0.34480	-0.10065	-0.04216	-0.51249	-1.29303	4.36247	1.40926

Note: * indicates statistically significant at 5% level of significance

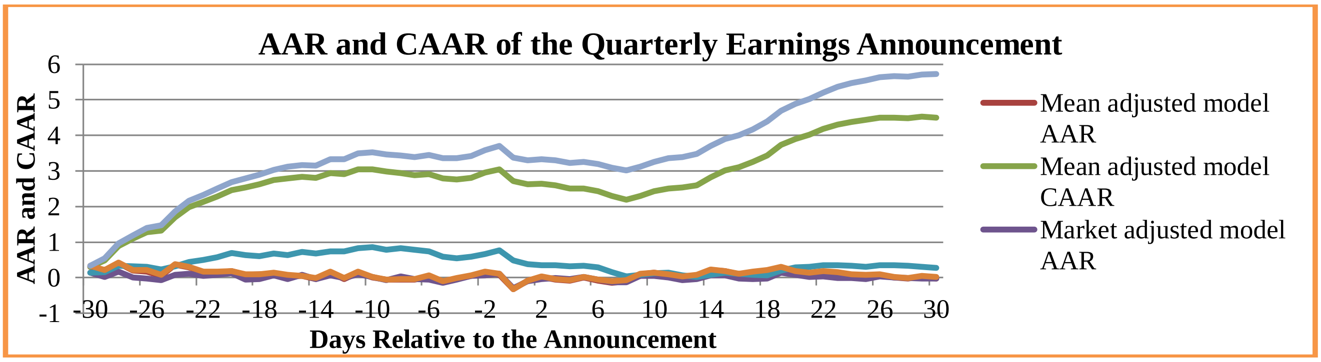

Figure 3 *AARs and CAARs Trends of Three Models over the 61-Day Event Window of Bad News Earnings Announcement of September 2013 Quarter*

Table 4 *Runs and Sign Test Statistics of September 2013 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	1.0079	6.0177	-0.1551	3.7131	0.1010	7.8102
After	-1.6066	5.1121	-1.5382	3.2863	-1.6066	5.4772
Overall	-2.9684	3.4125	-1.4186	1.9757	-2.4402	5.5678
Bad News Earnings Announcement						

Before	-1.8581	4.9934	-3.2565	-0.8963	-1.8581	4.4813
After	-1.8165	4.0166	-0.5427	-1.4606	-0.6504	4.0166
Overall	-3.6901	3.0533	-2.1197	0.1796	-3.0092	2.3349
Full Sample Earnings Announcement						
Before	-1.8581	6.2738	-2.7814	3.2009	-1.8581	7.5542
After	-1.6400	5.1121	-1.2782	1.8257	-1.6066	5.4772
Overall	-3.1666	3.7717	-2.8406	2.6941	-2.9320	5.2086

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.

From Runs statistics, it is observed that the AARs of mean adjusted model and market model and market adjusted model of all the portfolios are significant for overall period except good news portfolio of market adjusted model and therefore, we reject the null hypothesis that AARs occur randomly at 5% level of significance for the entire event window. 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 positively changes as expected in the study for all the length intervals except 16th, 19th and 20th day. The first pass beta ranges from 0.5579 to 0.7916 during the pre-event and from 0.6179 to 0.9158 for the post-event period. Using one day return interval betas rise to 11.10%. With two days interval, betas rise to 3.68%, 5th day interval rise to 19.14%, 10thday interval rise to 18.30%, 15th day interval rise to 4.92%, and on 20th day interval fall to -0.01%. The proportionate increase in beta shows better price adjustment on the quarterly earnings announcement and indicates better 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 all the interval period except 8thto 13th day. The R^2 values ranges from 0.1196 to 0.2556 for the pre event period and from 0.1398 to 0.2499 for the post event period. The highest positive change of 61.72% is observed on the 20th day interval period. The R^2 values are increased proportionately during the post event period as expected in the study except for 6 days. 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 BETA2 are negatively changed for 5th, 10th and 15th day interval and positively changed on 20th day interval. The BETA2 are negatively signed in the post event period for 5th and 10th day interval and this shows more market frictions in the market.

Table 5 *The Results of First Pass Beta and R Square Coefficients of September-2013 Quarter*

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	0.721248	0.749761	0.801297	0.720596	0.080049	11.10%	0.119617	0.182241	0.13985	0.186962	0.020233	16.91%
2	0.771805	0.800945	0.800213	0.744566	0.028408	3.68%	0.153582	0.206392	0.179551	0.212725	0.025968	16.91%
3	0.787723	0.852274	0.8202	0.844086	0.032477	4.12%	0.156084	0.207135	0.197754	0.218334	0.04167	26.70%
4	0.791565	0.94321	0.873056	0.944829	0.081491	10.29%	0.15677	0.211182	0.214333	0.225279	0.057563	36.72%
5	0.768625	1.045577	0.915753	1.015188	0.147128	19.14%	0.162033	0.218158	0.223861	0.230513	0.061828	38.16%
6	0.74244	1.14582	0.913685	1.084855	0.171246	23.07%	0.172617	0.227036	0.222226	0.233492	0.049609	28.74%
7	0.68231	1.236646	0.874918	1.140588	0.192609	28.23%	0.190823	0.23897	0.212557	0.228988	0.021734	11.39%
8	0.656415	1.243622	0.81841	1.262553	0.161995	24.68%	0.209661	0.253019	0.209281	0.227575	-0.00038	-0.18%
9	0.660992	1.323208	0.793894	1.340526	0.132902	20.11%	0.232663	0.268218	0.215278	0.230539	-0.01738	-7.47%
10	0.669821	1.446728	0.792388	1.34285	0.122567	18.30%	0.255612	0.280838	0.226123	0.238121	-0.02949	-11.54%
11	0.696024	1.433913	0.794872	1.332358	0.098849	14.20%	0.254777	0.28125	0.235503	0.243839	-0.01927	-7.56%
12	0.724962	1.354447	0.777446	1.33408	0.052484	7.24%	0.246712	0.282375	0.239712	0.246291	-0.007	-2.84%
13	0.731207	1.373682	0.758829	1.340533	0.027623	3.78%	0.245067	0.281957	0.241652	0.249062	-0.00341	-1.39%

14	0.696068	1.419822	0.746734	1.357461	0.050665	7.28%	0.239079	0.278776	0.242776	0.250961	0.003698	1.55%
15	0.670339	1.537048	0.703336	1.392437	0.032997	4.92%	0.236584	0.277408	0.242298	0.251196	0.005714	2.42%
16	0.658781	1.595483	0.646821	1.458722	-0.01196	-1.82%	0.227685	0.273387	0.242771	0.251829	0.015086	6.63%
17	0.55789	1.61498	0.617942	1.524273	0.060052	10.76%	0.207993	0.275518	0.243825	0.252954	0.035832	17.23%
18	0.56727	1.550496	0.627835	1.573588	0.060565	10.68%	0.183523	0.271091	0.246042	0.253912	0.062519	34.07%
19	0.73743	1.512812	0.643666	1.640579	-0.09376	-12.71%	0.170534	0.273106	0.249856	0.252854	0.079322	46.51%
20	0.65177	1.467449	0.651707	1.612335	-6.3E-05	-0.01%	0.152953	0.287857	0.247353	0.249964	0.0944	61.72%

Table 6 *The Results of Second Pass Beta Coefficients of September-2013 Quarter*

Length Intervals	Pre Event	Post Event	Difference
5	-0.11961	-0.18531	-0.06569
10	0.107384	-0.07806	-0.18544
15	0.113547	0.057466	-0.05608
20	0.184613	0.232785	0.048172

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 2013quarterly 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 market adjusted 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 are insignificant 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 AARs of bad news portfolio and CAARs of market adjusted model. The result from Cohen et al. (1983a) methodology shows the proportionate increase in beta shows better price adjustment on the quarterly earnings announcement and indicates better market quality. The R^2 values are increased proportionately during the post event period as expected in the study except for 6 days. The BETA2 are negatively changed for 5^{th}, 10^{th} and 15^{th} day interval and positively changed on 20^{th} day interval. The BETA2 are negatively signed in the post event period for 5^{th} and 10^{th} day interval and this shows more market frictions in the market. 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. This study contributes to the growing literature on EMH which documented abnormal performance following corporate event. The outcome of this study helps to evaluate the extent of informational content of quarterly announcements, and whether the investors are affected by the various signals associated with this information. The outcome of this study gives an indication to the analyst, broker, investor, trader, speculator about the future actions.

8. References

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