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Seasonal Analysis of Abnormal Returns after Quarterly Earnings Announcements

Dr. Iqbal

Associate Professor and Dean, College of Business Administration

The Kingdom University

P.O. Box 40434, Manama, Bahrain

Phone: +973-34010658, Email: thiqbal@yahoo.com

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Abstract

This study examines whether the Indian stock market is efficient in semi-strong form and seasonality exists. For this purpose, we take the first and fourth quarters' results of companies for the years 2008 to 2011. We divide companies into good news and bad news portfolios on the basis of percentage changes in net profits and net sales. We use event study methodology. The results reveal that average abnormal returns occur randomly and cumulative average abnormal returns are significant for both portfolios. Fourth quarter results give better positive signals to the market than first quarter results. We conclude that seasonality exists in the Indian stock market and it is also semi-strong form inefficient and investors can use this opportunity to buy and earn abnormal profit.

Keywords: Seasonal analysis, market efficiency, earnings announcements, average abnormal returns, cumulative average abnormal return

JEL: G13; G14; G 15; G18; C32; F30

1. Introduction

The literature on market efficiency has classified the market efficiency into three categories. They are weak form, semi-strong from and strong form efficiencies. Semi-strong form market efficiency examines whether investors can use publicly available information to earn extra normal returns, which we call as abnormal returns in this study. Event studies are now an important part of finance, especially in examining efficient market hypothesis (EMH). Event studies focus on the impact of various announcements like bonus issue, right issue, stock splits, earnings, mergers and acquisitions, buyback of stocks, etc on stock prices. Quarterly earnings announcements are one of the most important events and studies on stock market reaction to earnings information are included in the semi-strong form of efficient market hypothesis (EMH). Event study tests the response of stock prices to publicly available information and if response is instantaneous and accurate then the stock market is efficient in the semi-strong form. If the market takes time to respond, the market does not absorb the available information quickly and therefore, is not efficient in semi-strong form. This paper examines the market reactions to quarterly earnings announcements after the SEBI made it mandatory for listed companies to announce the quarterly results. The paper is organized into six sections. The first part is introduction; part 2 deals with review of literature; part 3 deals with objectives and hypotheses of the study; part 4 presents sample, data and methodology; empirical results are analyzed in part 5 and part 6 presents conclusions.

2. Review of Literature

Bernard and Thomas (1989) examined post-earnings announcement drift to ascertain whether it is delayed stock price response or premium for the risk undertaken by the investors. They concluded that there is persistence of post-earnings announcements drift. Bernard and Thomas (1990, 338) hypothesize that, due to the unexploited information, abnormal returns at earnings announcements can be predicted from past earnings. They concluded, "While prices may partially reflect the information in past earnings concerning future earnings, they do not reflect all available information". They focus on abnormal returns at the time of quarterly earnings announcements in the pattern of +, - for first and fourth quarters respectively. Ball and Bartov (1996) by using Bernard and Thomas's (1990) data concluded that stock prices do not fully reflect quarterly earnings information. They showed that abnormal returns at the time of quarterly earnings announcements occur in the pattern of -, + for first and fourth quarters respectively. Jordan (1973) examined the adjustment of stock prices to quarterly earnings information concluded that the markets evaluated the third quarter and annual earnings reports differently from the first and second quarter reports.

Event study on Indian stock markets has yielded mixed results. Rao (1994) examined the share price responses to some of the corporate financial policy announcements such as dividend increase, bonus issue and equity rights and proved that Indian stock market is semi-strong form of efficient. However, Obaidullah (1990) examined market reaction to half yearly earnings announcement by companies and concluded that semi-strong form of EMH could not be accepted for Indian stock market. Chaturvedi (2000) studied the behaviour of stock returns both before and after the announcement of half yearly earnings. The results

suggested the occurrence of abnormal returns during the pre and post earnings announcement periods. Manickaraj (2004) found that the quarterly earnings announcements have information relevant for security valuation and the stock market uses this information and immediately reflect it in stock prices. Market reacts positively to positive information and negatively to negative information. Thus, he concluded that Indian stock market is semi-strong form efficient. However, Mallikarjunappa (2004), Iqbal (2005) and Iqbal and Mallikarjunappa (2007) found that Indian stock market does not react immediately to quarterly earnings announcements and cumulative average abnormal returns prevail during the entire event window. Therefore, they concluded that Indian stock market is not efficient in the semi-strong form.

The review of the studies on Indian stock market shows that there is no conclusive evidence to show that Indian stock market is semi-strong form efficient. Further, to our knowledge, there is no study on seasonal or quarter-by-quarter analysis of abnormal returns after quarterly earnings announcements on Indian market till now. Therefore, this paper focuses on market efficiency and seasonal or first quarter (June) and fourth quarter (March) analysis of abnormal returns after quarterly earnings announcements.

3. Objectives and Hypotheses

3.1 Objectives of the Study

This study is conducted with the following objectives:

1. To examine seasonal behaviour of abnormal returns after quarterly earnings announcements.
2. To examine whether the Indian stock market is semi-strong form efficient.

3.2 Hypotheses

The hypotheses being tested are:

1. The adjustments of stock prices to the quarterly earnings announcements are complete on the day of the announcement.
2. The investors cannot earn abnormal returns by trading in the stocks after the quarterly earnings announcements.
3. The average abnormal returns and the cumulative average abnormal returns are close to zero.
4. The average abnormal returns occur randomly.
5. There is no significant difference between the number of positive and negative average abnormal returns.
6. Market evaluates the first and fourth quarter results in identical ways.

4. Sample, Data and Methodology

4.1 Sample

We have selected the sample from the companies that announced the quarterly earnings from June 2008 to June 2011. We have selected companies based on the following criteria:

(1) companies should have announced the quarterly earnings for June 2008 quarter to June 2011quarter (quarters selected for this study) and should not have any price sensitive information during the event window (-30 days to +30 days).

(2) Companies should have 20 percent or above foreign holdings and are traded on Bombay Stock Exchange (BSE) for more than 40 percent of the trading days during the year under consideration.

4.2 Classification of Companies into Portfolios

We use two variables, net profit and net sales, to construct portfolios. The method used for the classification of companies into portfolio consists of dividing the companies on the basis of percentage changes in quarterly earnings (net profit) and net sales. The percentage changes in net earnings and net sales in the current quarter over the corresponding quarter in the previous year are ascertained. On the above basis we classify companies into two portfolios. The first portfolio includes firms with positive percentage change in net earnings (net profit) and net sales and is designated as "good news" portfolio. The second portfolio contains firms with negative percentage change in net earnings (net profit) and net sales and is designated as "bad news" portfolio. In case a particular firm's percentage changes in net profit is positive and, net sales are 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. The number of companies included in good news portfolio and bad news portfolio for each quarter during the study period is presented in the Table 1.

Table 1. Number of companies included in the good news and bad news portfolio

	Good News Portfolio				**Bad News Portfolio**			
Year	2008	2009	2010	2011	2008	2009	2010	2011
Quarters	Number of companies				Number of companies			
March	------	82	90	99	------	79	85	52
June	78	70	96	90	73	82	62	69

4.3 Data

We have used three sets of data in this study. The first set of data consists of quarterly earnings announcement made by the sample companies. This includes the dates on which the

board of directors meets and approves quarterly financial results of the company and summary results for the quarter. The second set of data consists of daily-adjusted closing prices of the stocks selected for study at the Bombay Stock Exchange for the period covered by this study. Daily-adjusted closing prices are used in the study as these are assumed to reflect the consensus of the market participants regarding price of stock at the end of the trading. The third set consists of the BSE-200 index of ordinary share prices compiled and published by the Bombay Stock Exchange. The price data were obtained from the Prowess database of the Centre for Monitoring Indian Economy (CMIE) and BSE website.

4.4 Methodology

We have used a two-stage approach to test the stock price responses to quarterly earnings announcement. The first stage consists of estimation of parameters like alpha, beta based on the ex-post returns on stocks and market index, and expected returns on each of the stocks based on the market model. This is done by taking three years prices/indices data. This is the period immediately preceding the even window period. In the second stage these estimated parameters are used to calculate abnormal returns around the event day. In this study, the date of quarterly earnings announcement is defined as day 0 or event day. If event day is a non-trading day then the immediate following trading day is considered as an event day. Pre-announcement period includes 30 trading days prior to the earnings announcement date, i.e., days -30 to -1. Post announcement period includes 30 trading days after the earnings announcement i.e., days +1 to +30. Thus we have taken the event window of 61 trading days (including day 0 as the event day). The estimated abnormal returns are averaged across securities to calculate average abnormal returns (AARs) and average abnormal returns are then cumulated over time in order to ascertain cumulative average abnormal returns (CAARs). Fama (1991) called this methodology as event study methodology.

We use market model to measure the returns of stock that are related to market movement. Mathematically, market model can be expressed as:

$$E\left(R_{it}\right)=\alpha_i+\beta_i R_{mt}+e_{it} \qquad for \quad i \quad = \quad 1,\ldots N$$

(1)

Where,

E (R_{it}) = Expected return on security ‘i’ during time period‘t’

$\propto_i$ = Intercept of a straight - line or alpha coefficient of i^{th} security.

β_i = Slope of a straight - line or beta coefficient of i^{th} security

R_{mt} = Expected return on index (BSE 200 Index in this study) during period‘t’

e_{it} = Error term with a mean zero and a standard deviation which is a constant during time period ‘t’. We use log returns.

The values of $\propto_i$ and β_i to estimated using the above equation and the expected returns are following simplified model of regression:

$$Expected\ Return = E(R_{it}) = \propto_i + \beta_i R_{mt} \quad (2)$$

The abnormal returns are computed using the following model:

$$AR_{it} = e_{it} = R_{it} - E(R_{it}) \quad (3)$$

Where,

R_{it} = Actual Returns

The abnormal returns of individual security are averaged for each day surrounding the event day i.e., 30 days before and 31 days after the event day. The AR is the average deviation of actual returns of a security from the expected returns. To compute the average abnormal returns (AARs) the values of ARs are averaged across all the companies for each day.

Since the security's overall reaction to the quarterly earnings announcement or the event will not be captured instantaneously in the average abnormal return behaviour for one specific day, it is necessary to accumulate the abnormal returns over a long period. This gives an idea about average stock price behaviour over time. Generally, if the market is efficient, the CAAR should be close to zero (Brown and Warner (1980, 1985) Fuller and Farrell, Jr., (1987), Mallikarjunappa (2004) and Iqbal (2007). The model used to ascertain CAAR is:

$$CAAR_t = \sum_{t=-30}^{K} AAR_{it} \qquad Where\ k = -30,...0, ... +30. \quad (4)$$

4.4.1 Parametric Significance Test

The cumulative average abnormal return provides information about the average price behaviour of securities during the event window. If markets are efficient, the AARs and CAARs should be close to zero. Parametric't test' is used to asses significance of AARs and CAARs. The 5% level of significance with appropriate degree of freedom was used to test the null hypothesis of no significant abnormal returns after the event day. The conclusions are based on the results of t values on AARs and CAARs for the event window.

4.4.2 Non-Parametric Significance Test

To avoid the restricted assumption of a particular distribution, which a parametric test makes, we have used the non-parametric 'runs test' and 'sign test' in addition to t test.

4.4.2.1 Runs Test

Runs test has been used to analyze the randomness in the behaviour of AARs. Runs test is performed to test the null hypothesis that AARs occur randomly. If the observed runs are not significantly different from the expected number of runs, then it is inferred that AARs occur randomly. On the other hand, if this difference were statistically significant, it would be regarded, as AARs do not occur randomly. We have carried out runs test on AARs for the event window.

4.4.2.2 Sign Test

In the sign test positive or negative signs are used instead of quantitative values. We have carried out sign test on AARs to test the null hypothesis that there is no significant difference between the number of positive and negative AARs. We have calculated sign test statistics before and after the event day (that is, during the event window).

5. Empirical Results and Discussion

The summaries of the empirical results of good news and bad news portfolios for the first (June) and fourth (March) quarters are presented in Tables 2 to 10. In India financial year starts on 1st April and ends on 31st March of next year. The results are presented and discussed for each portfolio for each quarter viz., June (first) quarter and March (fourth) quarter. The purpose is to ascertain and compare abnormal returns' behaviour for the first and fourth quarter of different years and to assess whether the Indian market is efficient in the semi-strong form.

5.1 Good News Portfolio:

5.1.1 June 2008 to 2011 (First) Quarter

Table 2 below presents empirical results of good news portfolio for the first quarter of 2008 to 2011.

Table 2. Summary of AAR and CAAR of Good News Portfolio for the June quarters

	June 2008				June 2009			
	AAR	**%**	**CAAR**	**%**	**AAR**	**%**	**CAAR**	**%**
Bef -ve	20	66.67	30	100.00	13	43.33	0	0.00
Aft -ve	8	25.81	15	48.39	20	64.52	7	22.58
Bef +ve	10	33.37	0	0.00	17	56.67	30	100.00
Aft +ve	23	74.19	16	51.61	11	35.48	24	77.42
Tot -ve	28	45.90	45	73.77	31	50.82	7	11.48
Tot +ve	33	54.10	16	26.23	30	49.18	54	88.52
	June 2010				**June 2011**			
	AAR	**%**	**CAAR**	**%**	**AAR**	**%**	**CAAR**	**%**
Bef -ve	10	33.33	1	3.33	10	33.33	3	10.00
Aft -ve	16	51.61	0	0.00	7	22.58	0	0.00
Bef +ve	20	66.67	29	96.67	20	66.67	27	90.00
Aft +ve	15	48.39	31	100.00	24	77.42	31	100.00
Tot -ve	26	42.62	1	1.64	17	27.87	3	4.92
Tot +ve	35	57.38	60	98.36	44	72.13	58	95.08

Notes:

1. Good News Portfolio: The firms with positive percentage change in net earnings and net sales.

2. Bef –ve: Total number of negative AARs and CAARs before the event day.
3. Aft –ve: Total number of negative AARs and CAARs after the event day.
4. Bef +ve: Total number of positive AARs and CAARs before the event day.
5. Aft +ve: Total number of positive AARs and CAARs after the event day.
6. Tot -ve: Total number of negative AARs and CAARs for the event window.
7. Tot +ve: Total number of positive AARs and CAARs for the event window.

On the basis of the results presented in Table 2, it can be seen that for the event window of 61 days, AARs are negative for 28 days (45.90%) and positive for 33 days (54.10%). The corresponding numbers for June 2009 are 31 days (50.82%) and 30 days (49.18%). This implies that AARs are negative and positive for almost equal number of the days. This indicates that daily traders would earn abnormal returns and incur abnormal loss for almost equal number of days by trading on these shares during the event window in 2009. For the remaining two years, 2010 and 2011, AARs are positive for 35 days (57.38%) and 44 days (72.13%) respectively. It shows that, during June 2010 and June 2011quarters the daily traders will earn excess returns for 35 days (57.38%) and 44 days (72.13.%) out of 61 days, respectively and incur losses in the remaining days. The results related to CAARs which are shown in the above Table reveals that CAARs are negative for the majority of the days i.e., 45 (73.77%) for June 2008 quarter. However, CAARs are positive for the majority of the days for June 2009, 2010, and 2011 quarters.

Table 3. t -Test Statistics on AARs and CAARs for the June quarters

	Good News Portfolio				**Bad News Portfolio**			
	AAR	**%**	**CAAR**	**%**	**AAR**	**%**	**CAAR**	**%**
June 2008								
Bef-RT	1	25.00	0	0.00	0	0.00	1	4.00
Bef-LT	3	75.00	30	100.00	3	100.00	24	96.00
Aft-RT	1	33.33	16	55.17	3	100.00	5	16.67
Aft-LT	2	66.67	13	44.83	0	0.00	25	83.33
Tot-RT	2	28.57	16	27.71	3	50.00	6	10.91
Tot-LT	5	71.43	43	72.29	3	50.00	49	89.09
June 2009								
Bef-RT	5	55.56	29	100.00	10	50.00	30	100.00
Bef-LT	4	44.44	0	0.00	10	50.00	0	0.00
Aft-RT	1	20.00	22	78.57	0	0.00	7	22.58
Aft-LT	4	80.00	6	21.43	5	100.00	24	77.42
Tot-RT	6	42.86	51	89.47	10	40.00	37	66.67
Tot-LT	8	57.14	6	10.53	15	60.00	24	39.37
June 2010								

Bef-RT	8	80.00	28	100.00	4	80.00	25	100.00
Bef-LT	2	20.00	0	0.00	1	20.00	0	0.00
Aft-RT	5	45.45	31	100.00	3	30.00	32	100.00
Aft-LT	6	54.55	0	0.00	7	70.00	0	0.00
Tot-RT	13	61.90	59	100.00	7	46.67	57	100.00
Tot-LT	8	38.10	0	0.00	8	53.33	0	0.00
June 2011								
Bef-RT	5	71.43	24	92.31	3	100.00	15	50.00
Bef-LT	2	28.57	2	7.69	0	0.00	15	50.00
Aft-RT	8	88.89	31	100.00	6	100.00	31	100.00
Aft-LT	1	11.11	0	0.00	0	0.00	0	0.00
Tot-RT	13	81.25	55	96.49	9	100.00	46	75.41
Tot-LT	3	18.75	2	3.51	0	0.00	15	24.59

Notes:

1. Bef-RT, Bef-LT, Aft-RT, Aft-LT indicate the number of t-values that fall in the right (RT) and left tail (LT) of the rejection region when t-values, which are statistically significant at 5% significance level, are counted separately for the periods before and after the event day.

2. Tot-RT, Tot-LT indicates the number of statistically significant t-values that fall in the right (RT) and left tail (LT) of the rejection region for the entire event window period.

The t-test results on AARs shown in Table 3 indicates that during the event window of 61 days AARs are statistically significant for 7 days, 14 days, 21 days, and 16 days for good news portfolio and 6 days, 25days, 15 days, and 9 days for bad news portfolio during June 2008, 2009, 2010 and 2011 quarters respectively. This suggests that during the event window of 61 days AARs are close to zero for 54 days, 47 days, 40 days and 45 days for good news portfolio and 55 days, 36 days, 46 days, and 52 days for bad news portfolio during June 2008, 2009, 2010 and 2011 quarters respectively.

The t-test results on CAARs shown in Table 3 indicates that during the event window of 61 days CAARs are statistically significant for 59 days, 57 days, 59 days, and 57 days for good news portfolio and 55 days, 61 days, 57 days, and 61 days for bad news portfolio during June 2008, 2009, 2010 and 2011 quarters respectively. These are similar to the observation made by Ball and Brown (1968), Watts (1978), Rendleman et al (1982) and Foster et al (1984) who observed that estimated CAARs continue to drift up for "good news" firms. Therefore, we conclude that for the first quarters during the study period stock price responses to quarterly earnings are delayed and persist 30 days after the announcements of quarterly earnings.

Table 4. Runs and Sign Test Statistics for the June quarters

	Good News Portfolio			Bad News Portfolio		
	Runs	**Runs Statistics**	**Sign Statistics**	**Runs**	**Runs Statistics**	**Sign Statistics**
June 2008						
Before	14	1.68830	-2.19089	12	-1.31337	-0.67730
After	16	0.18546	1.98333	15	-0.09947	1.62245
Overall	30	0.12745	-0.11120	27	-1.13677	0.65550
June 2009						
Before	10	-2.19443	1.09556	4	-4.25934	0.00000
After	18	0.95458	-0.89803	12	-1.07050	-1.97513
Overall	28	-0.93495	0.13804	16	-3.67495	-1.40952
June 2010						
Before	16	0.62323	1.78574	18	0.74322	0.00000
After	6	-2.83442	-0.17961	7	-1.55126	-0.54535
Overall	22	-2.35566	1.45233	25	-1.66400	-0.30661
June 2011						
Before	12	-0.66986	1.82574	10	-3.31256	0.36515
After	12	0.07765	2.99950	14	0.11449	2.44540
Overall	24	-0.69166	3.97510	24	-1.66120	1.92025

Notes:

1. Before: Number of runs, runs test statistics and sign test statistics before the event day.
2. After: Number of runs, runs test statistics and sign test statistics after the event day.
3. Overall: Number of runs, runs test statistics and sign test statistics for the event window (-30 through 30 days)
4. If the runs and sign test statistics are greater than the critical value of ±1.96, the relevant average abnormal return is statistically non-zero at the 5% significance level.

The analyses of the runs test results in Table 4 shows that during June 2008 quarter the results are statistically not significant. This indicates that during June 2008 quarter AARs occur randomly. During June 2009 quarter it is significant before the event day for both portfolios and for bad news portfolio for the entire event window. This shows that for bad news portfolio AARs do not occur randomly during the event window. During June 2010 quarter runs test results are not significant before the event day but after the event day it is significant for bad news portfolio. However, for the good news portfolio it is significant after the event day and for the event window. This means that for the good news portfolio AARs do not occur randomly for the event window for good news portfolio. During June 2011quarter runs test results are not significant for both portfolios except for bad news portfolio before the

event day. These suggest that for the event window AARs are occurring randomly for both portfolios.

The sign test values shown in Table 4 shows that they are significant for good news portfolio before and after the event day but not significant for the event window during June 2008quarter. However, for bad news portfolio sign test results are not significant during June 2008quarter. This indicates that there is no significant difference between the number of positive and negative AARs for entire event window for both portfolios. During June 2009 and June 2010 quarter for both portfolios sign test results are not significant except for bad news portfolio after the event window during June 2009 quarter. The sign test results are significant for good news portfolio after and during the event window and after event day for bad news portfolio during June 2011quarter. For the entire event window (overall), the sign test results reveal that computed sign test values are not significant for quarters June 2008, June 2009, June 2010 and June 2011except for good news portfolio during June 2011quarter. This shows that for the entire event window, there is no significant difference between the number of positive and negative AARs during June 2008, June 2009, June 2010 and June 2011quarters and there is significant difference between the number of positive and negative AARs for good news portfolio during June 2011quarter. This leads to the conclusion that there is no trend in AARs during June 2008, June 2009, June 2010 and June 2011quarters for both portfolios except for good news portfolio during June 2011quarter.

5.1.2 March 2009 to 2011 (Fourth) Quarter

Table 5 presents summary of AARs and CAARs of good news portfolio for the March quarters from 2009 to 2011.

Table 5: Summary of AARs and CAARs of Good News Portfolio for the March quarters

	March 2009				**March 2010**				**March 2011**			
	AAR	**%**	**CAAR**	**%**	**AAR**	**%**	**CAAR**	**%**	**AAR**	**%**	**CAAR**	**%**
Bef –ve	10	33.33	0	0.00	6	20.00	3	10.00	11	36.67	0	0.00
Aft –ve	6	19.35	0	0.00	12	38.71	0	0.00	16	51.61	0	0.00
Bef +ve	20	66.67	30	100.00	24	80.00	27	90.00	19	63.33	30	100.00
Aft +ve	25	80.65	31	100.00	19	61.29	31	100.00	15	48.39	31	100.00
Tot –ve	16	26.23	0	0.00	18	29.51	3	4.92	27	44.26	0	0.00
Tot +ve	45	73.77	61	100.00	43	70.49	58	95.08	34	55.74	61	100.00

It is evident from Table 5 that AARs are positive for the majority of the days and for the remaining days they are negative. The CAARs are positive for 100% of days for March 2009 and 2011 quarters and 95 percent of the days during March 2010 quarter. The stock price responses are in the same direction as reported by the literature i.e., drifted up for good news. These results are similar to Ball and Brown (1968), Watts (1978), Rendleman et al (1982) and Foster et al (1984).

5.2 Bad News Portfolio

The bad news portfolio contains firms with negative percentage change in net earnings (net profit) and net sales. The summary of AARs and CAARs related to bad news portfolio for the first (June) and fourth (March) quarters are presented in Tables 6 and 7 respectively.

June 2008 to 2011 (First) Quarter

An examination of Table 6 that presents results of first quarter for the year 2008 to 2011 reveals that AARs are positive for the majority of the days. For the remaining two years, 2009 and 2010, AARs are negative for the majority of the days. This means that out of four years, two years' AARs are positive for the majority of the days and for remaining two years they are negative for majority of the days.

Table 6. Summary of AAR and CAAR of Bad News Portfolio for the June quarters

	June 2008				June 2009			
	AAR	**%**	**CAAR**	**%**	**AAR**	**%**	**CAAR**	**%**
Bef -ve	18	60.00	24	80.00	13	43.33	0	0.00
Aft -ve	12	38.71	25	80.65	20	64.52	23	74.19
Bef +ve	12	40.00	6	20.00	17	56.67	30	100.00
Aft +ve	19	61.29	6	19.35	11	35.48	8	25.81
Tot -ve	30	49.18	49	80.33	33	54.09	23	37.70
Tot +ve	31	50.82	12	19.67	28	45.91	38	62.30
	June 2010				**June 2011**			
	AAR	**%**	**CAAR**	**%**	**AAR**	**%**	**CAAR**	**%**
Bef -ve	15	50.00	2	6.67	14	46.67	15	50.00
Aft -ve	19	61.29	0	0.00	9	29.03	0	0.00
Bef +ve	15	50.00	28	93.33	16	53.33	15	50.00
Aft +ve	12	38.71	31	100.00	22	70.97	31	100.00
Tot -ve	34	55.74	2	3.28	23	37.70	15	24.59
Tot +ve	27	44.26	59	96.72	38	62.30	46	75.41

Note: Bad News Portfolio: The firms with negative percentage change in net earnings and net sales.

For the bad news portfolio, CAARs are positive for the majority of the days for all the quarters from June 2009 to June 2011but they are negative for June 2008. This shows that even though quarterly earnings conveyed bad news, the CAARs are positive for the majority

of the days during the event window. These results are in contrast to the results of earlier studies, which reported that CAARs are negative for the bad news [Ball and Brown (1968), Watts (1978), Rendleman et al (1982) and Foster et al (1984)]. The analysis of the results indicates a positive trend in CAARs for bad news portfolio.

Table 3 reveals that the computed t-values on AARs are not significant. However, t- test statistics on CAARs are statistically significant at 5% significance level. From this analysis we infer that for the majority of the days AARs are close to zero and CAARs are significantly greater than zero.

It is evident from Table 4 that the runs test values are significant before the event day for the quarter June 2009 and 2011 and after the event day for June 2010. These indicate that there is a trend in AARs for these periods. For the overall event-window period the runs test values are not significant for three out of the four periods (June 2008, 2010, 2011) and are significant for only one period, June 2009. Therefore, we conclude that there is no trend in the AARs and they occur randomly, exception being June 2009

The computed values of sign test reveal that they are significant after the event day for the period June 2009 and June 2011and they are not significant for before and after the event day for the remaining periods. For the overall window period, the sign test values are in the acceptance region at 5% level of significance. Therefore, we conclude that there is no significant difference between the number of positive and negative AARs which, in turn, indicates that no trend is discernible.

From the above analysis we infer that for the majority of days AARs are closer to zero, they occur randomly and there no evidence of specific direction for these. However, CAARs are significantly greater than zero and offers an opportunity to make a profit even by entering the bad new portfolio after the first quarter results.

5.2.2 March 2009 to 2011 (Fourth) Quarter

The empirical results presented in Table 7 show that for the fourth quarters, AARs and CAARs are positive for the majority of the days for bad news portfolio. It is to be noted that when companies report a decline in sales and profit, we can expect the returns to be negative for these companies. Our results are not in the same direction as expected and contradict the conclusions of Ball and Brown (1968), Watts (1978), Rendleman et al (1982) and Foster et al (1984).

Table 7. Summary of AAR and CAAR of Bad News Portfolio for the March quarters

	March 2009				March 2010				March 2011			
	AAR	%	CAAR	%	AAR	%	CAAR	%	AAR	%	CAAR	%
Bef –ve	8	26.67	3	10.00	9	30.00	0	0.00	13	43.33	3	10.00
Aft –ve	6	19.35	0	0.00	9	29.03	0	0.00	14	45.16	0	0.00
Bef +ve	22	73.33	27	90.00	21	70.00	30	100.00	17	56.67	27	90.00
Aft +ve	25	80.65	31	100.00	22	70.97	31	100.00	17	54.84	31	100.00
Tot –ve	14	22.95	3	4.92	18	29.51	0	0.00	27	44.26	3	4.92

Tot +ve	47	77.05	58	95.08	43	70.49	61	100.00	34	55.74	58	95.08

A close scrutiny of the t-test results presented in Table 9 shows that computed t-values on AARs are not significant for the majority of the days, which indicates that AARs tend to be zero. However, the t-values on CAARs reveal that they are statistically significant at 5% level for an overwhelming majority of the days. Further, 98.15% of the statistically significant CAAR values before the event day are on the right tail for bad news portfolio and 100% of the significant CAAR values are on the right tail after the event day for March 2009for good news portfolio. For quarters March 2010 and March 2011, 100% of the statistically significant CAAR values are on the right tail of the t-distribution. This means that CAARs offer positive signals even for bad news portfolios and investors can make abnormal profits. These results indicate that investors who enter the market before as well as after the results are announced can make abnormal profits on a cumulative basis. This is a clear sign of market inefficiency.

The runs test statistics presented in the Table 10 for all the years show that they are not statistically significant. On the basis of this we can conclude that AARs occur randomly and there is no particular trend for AARs. A reading of the Table 7 shows that in two (2009 and 2010) out of three periods, the computed values of the sign test are significant at 5% level. This indicates that there is a significant difference between the number of positive and negative AARs during these periods. On the other hand, for the year 2011 sign test values are not significant which indicate that there is no significant difference in the number of positive and negative AARs. Therefore, we conclude that while no discernible trend exists in AARs, the number of positive AARs exceed the number of negative AARs for two out of three periods which offers more positive signals to the investors. Since the number of positive AARs is more than that of the negative AARs, on a cumulative basis, this result in statistically significant positive CAARs. Overall result show that investors can make abnormal profits even in bad news portfolios by entering into the stocks after the fourth quarter results are announced.

The comparison of the AARs for June and March of the respective years for bad news portfolios show that these are negative for the majority of the days for June 2009 and 2010 while these are positive for March quarter of the same years. The results for the year 2011 show that these are positive for majority of the days for both June and March quarters. Therefore, we conclude that March quarter results give more robust signals to the market than the June quarter results. This is further confirmed by the results of the sign test which showed that the number of positive AARs exceeded the number of negative AARs for March quarter while no such robust results were found for June quarters. The comparison of the CAARs for June and March quarters show that although both exhibit the same trend, the number of positive values is more for March quarters than for June quarters and therefore, we conclude that March quarter results are giving much robust positive signals to the market than the June quarter results. Further, March quarter CAAR values are higher than the June quarter values as shown below:

Table 8. The last day's (+30th day) CAARs of Good and Bad News Portfolios for June and March quarters

Year	**2009**		**2010**		**2011**	
	Good News	**Bad News**	**Good News**	**Bad News**	**Good News**	**Bad News**
June	-0.01431	-0.05259	0.05912	0.00288	0.13514	0.12557
March	0.19421	0.37594	0.12105	0.19784	0.09368	0.12389

It is clear from the above table that the cumulative returns for March quarter are higher than the cumulative returns for June quarters. The exception seems to be the June 2011quarter. In summary we observe that March quarter results result in higher abnormal returns than June quarter results. Therefore, seasonality exists in the Indian market. This result is similar to Jordan (1973) who found that market evaluates different quarterly results differently.

The parametric t-test is carried out on AARs and CAARs for these quarters and the results are presented in Table 9.

Table 9. t-Test Statistics on AARs and CAARs for the March quarters

	Good News Portfolio				**Bad News Portfolio**			
	AAR	**%**	**CAAR**	**%**	**AAR**	**%**	**CAAR**	**%**
March 2009								
Bef-RT	3	75.00	27	100.00	7	100.00	22	95.65
Bef-LT	1	25.00	0	0.00	0	0.00	1	4.35
Aft-RT	7	100.00	31	100.00	8	100.00	31	100.00
Aft-LT	0	0.00	0	0.00	0	0.00	0	0.00
Tot-RT	10	90.91	58	100.00	14	100.00	53	98.15
Tot-LT	1	9.09	0	0.00	0	0.00	1	1.85
March 2010								
Bef-RT	5	100.00	24	96.00	5	100.00	24	100.00
Bef-LT	0	0.00	1	4.00	0	0.00	0	0.00
Aft-RT	2	66.67	31	100.00	6	100.00	31	100.00
Aft-LT	1	33.33	0	0.00	0	0.00	0	0.00
Tot-RT	7	87.50	55	98.21	11	100.00	55	100.00
Tot-LT	1	12.50	1	1.79	0	0.00	0	0.00
March 2011								

Bef-RT	3	75.00	26	100.00	2	50.00	26	100.00
Bef-LT	1	25.00	0	0.00	2	50.00	0	0.00
Aft-RT	3	37.50	31	100.00	3	60.00	31	100.00
Aft-LT	5	62.50	0	0.00	2	40.00	0	0.00
Tot-RT	6	50.00	57	100.00	5	55.56	57	100.00
Tot-LT	6	50.00	0	0.00	4	44.44	0	0.00

Notes: For explanation of the terms refer Table 3.

The results presented in Table 9 indicate that computed t-test values on AARs are not significant at 5% level. Therefore, AARs are close to zero. The t-test statistics on CAARs are statistically significant at 5% level. This suggests that CAARs are not close to zero for the majority of the days and abnormal returns exist after announcement of quarterly earnings and since the significant t-values are on the right tail, the CAARs are drifting upwards.

Table 10. Runs and Sign Test Statistics for the March quarters

	Good News Portfolio			**Bad News Portfolio**		
	Runs	**Runs Statistics**	**Sign Statistics**	**Runs**	**Runs Statistics**	**Sign Statistics**
March 2009						
Before	11	-1.6754	3.22604	12	-0.96627	2.29934
After	11	-0.47785	3.05329	11	1.16534	3.77181
Overall	22	-1.56988	3.94454	23	0.95749	3.99345
March 2010						
Before	12	0.98674	3.48890	10	-1.15813	2.18902
After	15	-0.37372	1.43724	14	0.10085	3.38901
Overall	27	0.67401	2.20065	24	-0.46671	3.22345
March 2011						
Before	14	-1.39981	1.78901	17	-0.90621	0.78601
After	19	0.87587	0.58709	18	0.98761	0.98820
Overall	33	-0.23107	1.77890	35	0.56892	0.78901

Note: Critical values are same as those given in notes to Table 4.

Table 10 presents the non-parametric results for the March quarter results. It is clear from above Table 10 that the runs test values are not statistically significant at 5% level for all the years. This indicates that AARs are independent and occurs randomly. Table 10 shows that the computed sign test values are significant at 5% level during the year 2009 and 2010 under both the portfolios and in the remaining one year it is not significant. This suggests that out of three years, in two years there is a significant difference between the number of positive and negative AARs. Therefore, these results imply that the number of positive signs significantly differ from that of the negative signs which offers scope for making profits.

The comparison of the AARs and CAARs for June and March quarters of the respective years

for good news portfolios shows that these are positive for majority of the days in all the years. The number of positive values is more in March quarters for both AARs and CAARs than for June quarters. However, the number of positive AARs is more in June 2011than that of March 2011. Similarly the number of positive CAARs is marginally more in June 2010 than that of March 2010. The trend of the results shows that March quarter results give robust positive signals to the market than the June quarter results. This is further confirmed by the sign test which showed that the number of positive signs significantly differ from that of the negative signs for March quarter and not for June quarters.

6. Research Implications

The overall results indicate that investors can earn abnormal profits by buying into both the good news and bad news portfolios both before and after the event-day provided they hold on to these stocks for some time instead of indulging in the daily trade. Our results also indicate that there are more number of positive AARs and CAARs in March quarters than those in June quarters and, March quarter results give more robust positive signals to the market to buy than those of the June quarter results. We attribute this to the fact companies also announce their un-audited annual results along with March quarter results which gives the overall financial condition of companies for the whole year. This reinforces positive signals to the market. Investors can use this opportunity to buy and earn abnormal profit.

7. Conclusions

The results of both good news and bad news portfolios show that the information absorption persist throughout the event window period and investors can earn abnormal profits on a cumulative basis. The overall results indicate that investors can earn abnormal profits by buying into both the good news and bad news portfolios both before and after the event-day provided they hold on to these stocks for some time instead of indulging in the daily trade. The results of this study on market efficiency are consistent with Fama et al (1969), Watts (1978), Foster et al (1984), Rendleman et al (1982), Bernard and Thomas (1989, 1990), Obaidullah (1990), Chaturvedi (2000), Mallikarjunappa (2004), Iqbal and Mallikarjunappa (2007). However, these are not consistent with Rao (1994) and Manickaraj (2004) who reported that Indian market is efficient in semi-strong form.

We find that the CAARs for the good news portfolio are significant and drift upwards after the event day and these are consistent with results reported earlier in the literature for the developed markets. Our results indicate that the CAAR values for good news portfolios are substantially higher than those for bad news portfolios. This result is consistent with results for the developed markets quoted earlier in this study. However, CAARs for bad news portfolio are also significant and drift upwards after the event day, while the earlier studies for developed markets reported that they drift downwards.

Our results also indicate that there are more number of positive AARs and CAARs in March quarters than those in June quarters and, March quarter results give more robust positive signals to the market to buy than those of the June quarter results. Therefore, we conclude that seasonality exists in the Indian market. We attribute this to the fact companies also

announce their un-audited annual results along with March quarter results which gives the overall financial condition of companies for the whole year. This reinforces positive signals to the market. Based on the evidence presented in this study we conclude that seasonality exists in the Indian market and it is also semi-strong form inefficient and investors can use this opportunity to buy and earn abnormal profit. We take caution in generalizing the result and suggest that further studies are required in this area.

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