A Study of Stock Price Behavior Around Earnings Announcements

Dr. T. Mallikarjunappa & Janet Jyothi D'souza

Abstract

Efficient Market Hypothesis (EMH) is being researched for a long time. Different issues have been researched to investigate whether the markets exhibit the characteristics of the efficient market. One of the most important criteria being used for testing the market efficiency is to know whether the market allows opportunity for the investors to make profit. Since it is difficult to simultaneously test the market efficiency in absolute form, the EMH is tested in weak form, semi-strong form and strong form. The objective of this study is to investigate whether stock prices adjust to quarterly earnings announcement information and to examine whether the EMH applies to the Indian stock market. This study focuses on the BSE-200index based companies listed on the Bombay Stock Exchange and uses quarterly earnings announcement as an event. The Mean Adjusted model, Market adjusted modeland Market model is used to measure the abnormal returns. The stock piece behavior is examined through event study methodology. We apply student-t test,Run and Sign test for the statistical significance. The resultsbased on quarterly earnings announcement information show that investors can earn abnormal profits.

Key words:*Efficient Market Hypothesis (EMH), Event Study, Indian stock market, quarterly earnings, Semi-strong form efficiency*

Introduction

In an efficient market every investor has equal access to information and therefore, any information that is released to the market should be available to every investor. Based on the information content of the stock prices, efficient market hypothesis (EMH) is investigated in weak, semi-strong and strong form. Researchers in finance have examined all these forms by taking different data sets, markets and time periods. The research in this field is more prominent in the western markets than in the emerging economies. Recently there has been a lot of focus on the emerging economies because of the type of growth these economies have been registering. Because of the strategic importance of the emerging economies, the west has been looking to these economies as growth centres. Therefore, the investigation of the market efficiency in the Indian context is an imperative need. While a lot research has taken place in the EMH in the western context, there is dearth of these studies in India. The available literature, as evidenced in the literature review section, shows that even though there are studies investigating the market efficiencies, there are no robust conclusions on the market efficiency. This inspires us to take up the investigation of the market efficiency in the India context. This paper is organized as follows: section 2 provides introduction, section 3 states the problem, section 4 reviews the literature, section 5 discusses the scope, section 6 discusses the objectives and hypotheses, section 7 discusses the methodology, section 8 discusses the results, section 9 presents the conclusions, section 10 states scope for further work, section 11 presents the limitation and finally section 12 provides the references.

Statement of the Problem

As discussed in the introduction section, the market efficiency is tested in three different forms. Since corporate actions are the continuous process, there is a need to investigate whether the stock markets are able to absorb the information content of earnings announcements. In an efficient market, when the earnings are publicly announced, the stock prices should immediately reflect this information and therefore deny investors any abnormal profits based on the study of the earnings data. Fama (1965, 1970) and other researchers studied whether the stock prices reflect publicly available information. They found that the market is efficient in absorbing the information content of the earnings and therefore, the investors cannot make profits by trading on the basis of this information. While a number of studies have supported the findings of Fama and others, there are other researchers who have found that the market is not efficient in reflecting the information content of the earnings announcements. Therefore, there is an imperative need to know whether the Indian market is efficient in processing the earnings information and reflecting it in the stock prices. Keeping this background, we propose to investigate the semi-strong form of the market efficiency.

Literature Review

Several studies have been conducted in different countries to investigate whether the markets are efficient in processing the information. Ball and Brown (1968) found that after the announcement of earnings, stocks earned normal returns. Fama et al. (1969) examined the behaviour of abnormal returns at the announcement of stock splits and found that there is a considerable market reaction prior to the stock split announcements. Brown and Kennelly (1972) suggested that disaggregation of annual EPS into its quarterly components improves the predictive ability of the EPS series by at least 30 to 40 percent. Jordan (1973) observed that the share prices of high growth companies adjust to earnings information differently than do the shares of medium and low growth firms and found that stock market is efficient in the semi-strong form.

Oppong (1980) argued that there is no relationship between the market model and the Sharpe-Lintner capital asset pricing model

(CAPM), except under some simplifying assumptions. Patell and Wolfson (1984) suggested that stock market responds very quickly to publicly available information. Bernard and Thomas (1990, 1989) observed delayed price response during post earnings-announcement drift and found that stock prices partially reflect a naive earnings expectation. Ball and Kothari (1991) found that the abnormal returns are not related to any over or under-reaction by the market to earnings news. Bartov (1992) observed post - announcement drift in stock prices. Bamber and Cheon (1995) investigated the frequency with which earnings announcements generate differential price and volume reactions, and then assessed whether these differential reactions are associated with announcement specific characteristic. They found that there is a positive relation between the magnitudes of price and volume reactions. Jegadeesh and Livnat (2006) studied post - earnings - announcement drift. They found that the magnitude of the observed drift in security returns after the announcement of earnings depends on the contemporaneous magnitude of the revenue (or sales) surprise.

In India, the studies on semi- strong form of Efficient Market Hypothesis (EMH) have examined the market reactions. Sanjoy (1975) found that opportunities for earning "abnormal" returns were afforded to investors. Obaidullah (1992) investigated the adjustment of stock prices to announcements of bonus issues by examining the efficiency of the Indian stock markets. It was found that the entire adjustment in stock prices attributable to the announcement occurs before the announcement. Mallikarjunappa (2004) examined June 2004 quarterly earnings of Sensex companies and concluded that the Indian market is not efficient in the -semi strong form. Iqbal and Mallikarjunappa (2007, 2008a, 2008b, 2010) examined the stock market efficiency in India by taking quarterly earnings announcement as an event. The results of the study revealed that Indian stock market is semi - strong form inefficient Raja, Sudhahar and Selvam(2009) examined the informational efficiency of Indian stock market with regards to stock split announcement released by the information technology companies. The result of the study showed the fact that the security prices reacted to the announcement of stock splits. The reaction took place for a very few days surrounding day 0.

The literature review shows that the quarterly earnings information is used by the researchers to examine the stock prices response and to assess the abnormal profits based on this information. While some studies found that the markets are efficient, others found that the markets are not efficient. Because of the importance attached to the emerging markets there is a need to know whether these markets exhibit the characteristics of the efficient market. Therefore, an attempt is made in this study to test semi- strong form of market efficiency in Indian stock market.

Scope of the Study

This study examines the semi--strong form of market efficiency in the Indian stock market. This study is based on the earnings announcement of BSE-200 index based companies for the September 2011 quarter. We observe abnormal return by using daily data. Our initial sample consists of 200 securities which are listed in Bombay stock exchange.On the basis of the availabledata, we select 192 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. The second set of data consists of daily adjusted closing prices of sample companies. The third set of data consists of the daily closing prices of BSE-200 index. We collect and use 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).

Objectives of the Study

This study has the following objectives:

1. To test whether Indian stock market reacts fast to the quarterly earnings.
2. To test the stock market reactions reflect the market efficiency.

Hypotheses:

The literature review in section 4 revealed that some markets absorb the information of earnings announcements and did not allow investors to make abnormal profits. Other studies also showed that the markets do allow investors to profit from the publicly available information. Based on this debate on the market efficiency, we formulate the following hypotheses:

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.

Methodology

We use event study methodology. 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., $t = -30,\ldots,0,\ldots, +30$) is designated as the "event" period or eventwindow. The days before the event period (i.e., $-280,\ldots, -31$) are designated as the "estimation" or "non-event" period. We use Mean Adjusted Return model, Market Adjusted Return model and Market Model to measure the abnormal returns. 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).

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. The good news portfolio consists of 107 companies, 85 companies are included in the bad news portfolio and all 192 companies are included in the overall portfolio.

Abnormal Return Measures:

Let is the observed arithmetic return for security i at day t, represents the abnormal return for security i at day t. we used following model to estimate the abnormal return for each day in the event period.

Mean Adjusted Return (Masulis 1978):

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

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

Where $\bar{R}_i$ is the average of security is daily returns in the (-280, -31) estimation period.

Market Adjusted Return (Cowles 1933, 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.

OLS Market Model (Sharpe 1964):

$$A_{i,t} = R_{i,t} - \hat{\alpha}_i - \hat{\beta}_i R_{m,t}$$

Where and are OLS values from the estimation period

The Beta is calculated by using the following equation.

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

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 Observation.

Average Abnormal returns (ARR):

The following model is used to calculate Average Abnormal returns (AAR)

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

Where i = Different securities in the study. N = Total number of securities. t = The days surrounding the event day

The Cumulated Average Abnormal Return (CAAR):

The computed AAR is accumulated over a long period to find out Cumulated Average Abnormal Return (CAAR) and expected that computed CAAR should be close to zero.

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

Where t = -30,.....0, ...+30

Parametric Significance Test:

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

The t test statistic for AAR:

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

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~~, Standard deviation, n = Number of observation

The t test statistic for CAAR:

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

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, = Standard Deviation, n= Number of Observations.

Non Parametric Significance Test:

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

Run test:

To analyze the randomness in the behavior of AAR, Run test is used. Run test has been conducted for AARs before and after the event day and also for the event window.

The Run 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.

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

A standardized variable 'Z' as under can express the difference between actual and expected number of the Runs:

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

Sign test:

In this test positive and negative Signs are used 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 calculated Sign test before and after the event day and also for the event window.

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

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 used 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_{H0} = Hypothesized proportion 0.5

Results and Discussions

We examined the impact of September 2011 quarterly earnings announcement of specific firms' on the prices of the securities. The main objective is to assess performance of sample companies during the event window based on this information flow. We assess abnormal performance of each sample securities by using Mean Adjusted Model. The empirical results are presented below.

Table 1: Average Abnormal Returns and Cumulative Average Abnormal Returns, for the Good news Earnings Announcements

	Mean adjusted model		Market adjusted model		Market model	
DAYS	AAR	CAAR	AAR	CAAR	AAR	CAAR
-30	-0.00083	-0.00083	0.00059	0.00059	-0.00134	-0.00134
-29	-0.00068	-0.00150	0.00126	0.00185	-0.00115	-0.00249
-28	-0.00170	-0.00320	-0.00234	-0.00050	-0.00231	-0.00480
-27	0.00215	-0.00106	0.00009	-0.00041	0.00131	-0.00349
-26	-0.00085	-0.00190	0.00239	0.00198	-0.00116	-0.00464
-25	-0.00919	-0.01109	-0.00077	0.00121	-0.00908	-0.01372
-24	-0.00619	-0.01728	-0.00066	0.00055	-0.00633	-0.02005
-23	-0.00153	-0.01881	-0.00326	-0.00271	-0.00234	-0.02240
-22	0.00511	-0.01371	0.00072	-0.00199	0.00400	-0.01839
-21	-0.00175	-0.01546	-0.00141	-0.00340	-0.00237	-0.02076
-20	0.00524	-0.01021	0.00201	-0.00140	0.00433	-0.01644
-19	-0.00354	-0.01376	-0.00368	-0.00507	-0.00420	-0.02063
-18	0.00162	-0.01214	0.00119	-0.00389	0.00090	-0.01973
-17	-0.00331	-0.01545	-0.00228	-0.00617	-0.00391	-0.02364
-16	-0.00268	-0.01813	-0.00213	-0.00830	-0.00329	-0.02694
-15	0.00339	-0.01474	-0.00061	-0.00891	0.00232	-0.02462
-14	0.00111	-0.01363	-0.00047	-0.00939	0.00030	-0.02432
-13	-0.00074	-0.01437	0.00061	-0.00878	-0.00124	-0.02556
-12	0.00268	-0.01169	0.00147	-0.00731	0.00193	-0.02363
-11	0.00084	-0.01084	-0.00103	-0.00834	0.00014	-0.02350
-10	0.00225	-0.00859	0.00039	-0.00795	0.00143	-0.02207
-9	0.00530	-0.00330	0.00012	-0.00783	0.00416	-0.01791
-8	0.00520	0.00190	-0.00095	-0.00878	0.00395	-0.01396
-7	0.00285	0.00475	-0.00222	-0.01100	0.00167	-0.01229
-6	0.00379	0.00854	-0.00048	-0.01147	0.00269	-0.00959
-5	0.00092	0.00947	-0.00048	-0.01196	0.00013	-0.00946
-4	0.00092	0.01039	-0.00114	-0.01310	0.00004	-0.00942
-3	0.00438	0.01476	-0.00037	-0.01347	0.00333	-0.00609
-2	0.00082	0.01558	0.00000	-0.01347	0.00011	-0.00598
-1	0.00604	0.02162	0.00512	-0.00835	0.00531	-0.00067
0	0.00367	0.02528	0.00513	-0.00322	0.00319	0.00252
1	-0.00077	0.02451	0.00356	0.00034	-0.00102	0.00151
2	-0.00726	0.01725	-0.00508	-0.00474	-0.00769	-0.00618
3	-0.00143	0.01582	-0.00019	-0.00492	-0.00190	-0.00808
4	-0.00502	0.01081	-0.00254	-0.00746	-0.00543	-0.01351
5	-0.00291	0.00790	0.00191	-0.00555	-0.00308	-0.01660
6	-0.00347	0.00442	0.00078	-0.00477	-0.00366	-0.02025
7	-0.00386	0.00056	0.00203	-0.00274	-0.00396	-0.02422
8	-0.00497	-0.00440	-0.00140	-0.00413	-0.00521	-0.02943
9	-0.00714	-0.01154	-0.00179	-0.00592	-0.00727	-0.03670

10	-0.00257	-0.01411	-0.00004	-0.00596	-0.00298	-0.03968
11	-0.00187	-0.01599	0.00103	-0.00493	-0.00228	-0.04197
12	-0.00288	-0.01886	-0.00036	-0.00529	-0.00329	-0.04526
13	-0.00206	-0.02093	0.00000	-0.00529	-0.00259	-0.04785
14	-0.00090	-0.02183	-0.00174	-0.00703	-0.00164	-0.04948
15	-0.00321	-0.02504	-0.00098	-0.00801	-0.00369	-0.05318
16	0.00219	-0.02284	0.00118	-0.00682	0.00143	-0.05175
17	-0.00084	-0.02369	0.00152	-0.00531	-0.00125	-0.05300
18	-0.00576	-0.02944	-0.00335	-0.00866	-0.00618	-0.05919
19	-0.00713	-0.03658	0.00111	-0.00755	-0.00700	-0.06619
20	-0.00482	-0.04140	-0.00038	-0.00793	-0.00500	-0.07119
21	0.00136	-0.04004	0.00370	-0.00423	0.00099	-0.07020
22	0.00032	-0.03972	-0.00020	-0.00442	-0.00031	-0.07050
23	-0.00082	-0.04054	0.00316	-0.00127	-0.00103	-0.07153
24	-0.00711	-0.04765	-0.00334	-0.00460	-0.00736	-0.07889
25	-0.00648	-0.05414	-0.00140	-0.00601	-0.00660	-0.08549
26	-0.00640	-0.06054	-0.00529	-0.01130	-0.00697	-0.09245
27	-0.00321	-0.06375	-0.00265	-0.01395	-0.00379	-0.09624
28	-0.00037	-0.06413	-0.00192	-0.01587	-0.00118	-0.09742
29	0.00001	-0.06412	-0.00160	-0.01747	-0.00082	-0.09823
30	-0.00272	-0.06684	-0.00273	-0.02020	-0.00339	-0.10163

From table1, we observe that under the Mean Adjusted model, AAR are positive for 23 days and negative for 38 days. It is further observed that CAAR values are positive for 16 days and negative for only 45 days. This result indicates that AAR and CAAR values are negative for majority of the days. Further AAR values are continuously positive from -12th day to 0th(event day) day and started reacting negatively after the announcement. This indicates that market had good expectations from this earnings announcement but turned negative after the announcement.When we observe Market Adjusted Model for the event window of 61 days, AARs are positive for 23 days and negative for 38 days. The results of CAAR value show positive for 6 days and negative for 55 days. When we observe closely, AAR values are positive for 4 days window (-2...+1). In the case of Market model, out of 61 days, AARs are positive 21 days and negative for 40 days and CAAR values are positive for 2 days and negative for 52 days. Further the AAR values positive for 13 days from -12thto up to the announcement day (- 12.....0) window period.The result of all the three models shows that AAR and CAAR values are negative for majority of the days.This result indicates that the quarterly earnings announcement had a negative impact on the market, especially after the earnings announcement.

Table 2: Average Abnormal Returns and Cumulative Average Abnormal Returns, for the Bad news Earnings Announcements

	Mean adjusted model		Market adjusted model		Market model	
DAYS	AAR	CAAR	AAR	CAAR	AAR	CAAR
-30	0.00095	0.00095	-0.00127	-0.00127	0.00008	0.00008
-29	-0.00711	-0.00616	-0.00699	-0.00826	-0.00780	-0.00772
-28	-0.00420	-0.01035	-0.00467	-0.01293	-0.00490	-0.01262
-27	0.00218	-0.00818	-0.00154	-0.01447	0.00113	-0.01149
-26	-0.00329	-0.01146	-0.00026	-0.01473	-0.00357	-0.01506
-25	-0.00922	-0.02068	0.00012	-0.01462	-0.00889	-0.02395
-24	-0.00236	-0.02304	0.00269	-0.01192	-0.00245	-0.02640
-23	-0.00045	-0.02350	-0.00333	-0.01525	-0.00142	-0.02783
-22	0.01017	-0.01333	0.00185	-0.01340	0.00857	-0.01926
-21	0.00635	-0.00698	0.00192	-0.01148	0.00522	-0.01404
-20	0.00035	-0.00663	-0.00470	-0.01618	-0.00088	-0.01492
-19	-0.00352	-0.01015	-0.00354	-0.01972	-0.00422	-0.01914
-18	-0.00093	-0.01108	-0.00228	-0.02200	-0.00174	-0.02088
-17	0.00138	-0.00970	0.00075	-0.02125	0.00061	-0.02027
-16	-0.00124	-0.01095	-0.00143	-0.02268	-0.00187	-0.02214
-15	0.00092	-0.01002	-0.00506	-0.02773	-0.00034	-0.02248
-14	-0.00220	-0.01222	-0.00423	-0.03196	-0.00306	-0.02554
-13	0.00006	-0.01216	0.00043	-0.03153	-0.00050	-0.02604
-12	0.00059	-0.01156	-0.00215	-0.03369	-0.00033	-0.02637
-11	-0.00007	-0.01163	-0.00257	-0.03626	-0.00100	-0.02736
-10	0.00459	-0.00704	-0.00145	-0.03771	0.00327	-0.02409
-9	0.01039	0.00335	0.00218	-0.03554	0.00885	-0.01524
-8	0.00707	0.01042	0.00051	-0.03502	0.00568	-0.00956
-7	0.00481	0.01523	-0.00179	-0.03681	0.00351	-0.00605
-6	0.00007	0.01530	-0.00271	-0.03952	-0.00086	-0.00691
-5	0.00215	0.01745	0.00160	-0.03792	0.00143	-0.00548
-4	-0.00017	0.01728	-0.00439	-0.04231	-0.00124	-0.00672
-3	0.00651	0.02379	0.00270	-0.03961	0.00544	-0.00128
-2	0.00114	0.02493	0.00021	-0.03940	0.00042	-0.00086
-1	0.00092	0.02585	-0.00199	-0.04139	0.00004	-0.00082
0	-0.01317	0.01269	-0.01033	-0.05172	-0.01349	-0.01431
1	-0.01503	-0.00234	-0.01019	-0.06191	-0.01515	-0.02946
2	-0.00862	-0.01096	-0.00779	-0.06970	-0.00913	-0.03859
3	-0.00339	-0.01435	-0.00068	-0.07038	-0.00374	-0.04233
4	-0.00531	-0.01966	-0.00342	-0.07380	-0.00572	-0.04805
5	-0.01115	-0.03082	-0.00614	-0.07994	-0.01125	-0.05929
6	-0.00675	-0.03757	-0.00084	-0.08078	-0.00677	-0.06606
7	-0.00870	-0.04627	-0.00322	-0.08400	-0.00879	-0.07485
8	0.00014	-0.04614	0.00279	-0.08121	-0.00022	-0.07507
9	0.00277	-0.04337	0.00654	-0.07468	0.00245	-0.07263
10	0.00153	-0.04183	0.00057	-0.07411	0.00075	-0.07187

11	0.00157	-0.04027	0.00260	-0.07151	0.00094	-0.07093
12	-0.00518	-0.04544	-0.00338	-0.07489	-0.00564	-0.07657
13	0.00171	-0.04373	0.00101	-0.07388	0.00093	-0.07564
14	0.00350	-0.04023	-0.00018	-0.07406	0.00240	-0.07324
15	-0.00220	-0.04244	-0.00238	-0.07644	-0.00294	-0.07618
16	0.00192	-0.04052	0.00013	-0.07631	0.00106	-0.07512
17	-0.00818	-0.04870	-0.00546	-0.08177	-0.00851	-0.08364
18	-0.00455	-0.05325	-0.00200	-0.08377	-0.00486	-0.08849
19	-0.01245	-0.06570	-0.00367	-0.08744	-0.01214	-0.10063
20	-0.00577	-0.07146	-0.00170	-0.08914	-0.00594	-0.10657
21	-0.00503	-0.07649	-0.00559	-0.09473	-0.00572	-0.11230
22	-0.00198	-0.07847	-0.00352	-0.09825	-0.00275	-0.11505
23	-0.00696	-0.08543	-0.00390	-0.10215	-0.00729	-0.12234
24	-0.00775	-0.09318	-0.00397	-0.10612	-0.00794	-0.13028
25	-0.00478	-0.09797	0.00171	-0.10441	-0.00475	-0.13503
26	-0.00726	-0.10523	-0.00740	-0.11181	-0.00795	-0.14298
27	0.00089	-0.10434	-0.00208	-0.11388	-0.00016	-0.14314
28	0.00118	-0.10316	-0.00279	-0.11667	0.00009	-0.14305
29	0.00082	-0.10235	-0.00147	-0.11814	-0.00012	-0.14317
30	-0.00320	-0.10554	-0.00256	-0.12070	-0.00380	-0.14698

Under the Mean Adjusted model during the entire event window of 61 days, AARs are positive for 28 days and negative for 33 days. We further observe that CAAR values are positive for 11 days and negative for 50 days. The Market Adjusted Model result reveals that AARs are positive for 18 days and negative for 43 days. The CAAR values are 100% negative during the event window. In the case of Market model, out of 61 days, AAR are positive for 20 days and negative for 41days, whereas CAAR values are positive for 1 day and negative for 60days. The above analysis clearly shows that the AAR and CAAR values of all the three models are negative for majority of the days. The close observation reveals that AARs are negative during the announcement day for all the three models.

This implies that bad news is conveyed in the earnings.

Table 3: Average Abnormal Returns and Cumulative Average Abnormal Returns for the Full Sample Earnings Announcements

	Mean adjusted model		Market adjusted model		Market model	
DAYS	AAR	CAAR	AAR	CAAR	AAR	CAAR
-30	-0.00004	-0.00004	-0.00024	-0.00024	-0.00071	-0.00071
-29	-0.00352	-0.00356	-0.00239	-0.00263	-0.00409	-0.00481
-28	-0.00280	-0.00637	-0.00337	-0.00600	-0.00346	-0.00826
-27	0.00216	-0.00421	-0.00064	-0.00664	0.00123	-0.00703
-26	-0.00193	-0.00614	0.00122	-0.00542	-0.00223	-0.00926

-25	-0.00920	-0.01534	-0.00038	-0.00580	-0.00900	-0.01825
-24	-0.00450	-0.01983	0.00082	-0.00497	-0.00461	-0.02286
-23	-0.00106	-0.02089	-0.00329	-0.00826	-0.00194	-0.02480
-22	0.00735	-0.01354	0.00122	-0.00704	0.00602	-0.01878
-21	0.00184	-0.01170	0.00006	-0.00698	0.00099	-0.01779
-20	0.00307	-0.00863	-0.00096	-0.00794	0.00202	-0.01577
-19	-0.00353	-0.01216	-0.00362	-0.01156	-0.00421	-0.01997
-18	0.00049	-0.01167	-0.00035	-0.01190	-0.00027	-0.02024
-17	-0.00123	-0.01291	-0.00094	-0.01285	-0.00191	-0.02215
-16	-0.00204	-0.01495	-0.00182	-0.01467	-0.00266	-0.02481
-15	0.00230	-0.01265	-0.00258	-0.01725	0.00114	-0.02367
-14	-0.00035	-0.01301	-0.00213	-0.01938	-0.00119	-0.02486
-13	-0.00038	-0.01339	0.00053	-0.01885	-0.00091	-0.02577
-12	0.00176	-0.01163	-0.00013	-0.01899	0.00093	-0.02484
-11	0.00044	-0.01119	-0.00172	-0.02070	-0.00036	-0.02521
-10	0.00329	-0.00791	-0.00043	-0.02113	0.00225	-0.02296
-9	0.00755	-0.00035	0.00103	-0.02010	0.00623	-0.01673
-8	0.00603	0.00567	-0.00030	-0.02040	0.00472	-0.01201
-7	0.00372	0.00939	-0.00203	-0.02243	0.00249	-0.00953
-6	0.00214	0.01153	-0.00146	-0.02389	0.00112	-0.00841
-5	0.00146	0.01300	0.00044	-0.02345	0.00071	-0.00770
-4	0.00044	0.01344	-0.00258	-0.02603	-0.00052	-0.00823
-3	0.00532	0.01876	0.00099	-0.02504	0.00427	-0.00396
-2	0.00096	0.01972	0.00009	-0.02495	0.00025	-0.00371
-1	0.00377	0.02349	0.00197	-0.02298	0.00298	-0.00074
0	-0.00379	0.01971	-0.00172	-0.02469	-0.00419	-0.00493
1	-0.00708	0.01263	-0.00252	-0.02722	-0.00727	-0.01220
2	-0.00786	0.00476	-0.00628	-0.03349	-0.00832	-0.02053
3	-0.00230	0.00246	-0.00041	-0.03390	-0.00271	-0.02324
4	-0.00515	-0.00268	-0.00293	-0.03683	-0.00556	-0.02880
5	-0.00656	-0.00924	-0.00165	-0.03848	-0.00670	-0.03550
6	-0.00493	-0.01417	0.00006	-0.03842	-0.00503	-0.04053
7	-0.00600	-0.02017	-0.00029	-0.03871	-0.00610	-0.04663
8	-0.00271	-0.02288	0.00046	-0.03826	-0.00300	-0.04964
9	-0.00275	-0.02563	0.00190	-0.03636	-0.00297	-0.05261
10	-0.00075	-0.02639	0.00023	-0.03613	-0.00133	-0.05393
11	-0.00035	-0.02674	0.00172	-0.03440	-0.00086	-0.05479
12	-0.00390	-0.03063	-0.00170	-0.03610	-0.00433	-0.05912
13	-0.00039	-0.03102	0.00044	-0.03566	-0.00103	-0.06015
14	0.00105	-0.02997	-0.00105	-0.03670	0.00015	-0.06000
15	-0.00277	-0.03274	-0.00160	-0.03830	-0.00336	-0.06336
16	0.00207	-0.03067	0.00072	-0.03759	0.00126	-0.06210
17	-0.00409	-0.03476	-0.00157	-0.03916	-0.00447	-0.06656

18	-0.00522	-0.03998	-0.00275	-0.04191	-0.00560	-0.07216
19	-0.00949	-0.04947	-0.00101	-0.04292	-0.00928	-0.08144
20	-0.00524	-0.05471	-0.00096	-0.04388	-0.00542	-0.08685
21	-0.00147	-0.05618	-0.00041	-0.04429	-0.00198	-0.08883
22	-0.00070	-0.05687	-0.00167	-0.04596	-0.00139	-0.09022
23	-0.00354	-0.06041	0.00003	-0.04593	-0.00380	-0.09402
24	-0.00740	-0.06781	-0.00362	-0.04955	-0.00762	-0.10164
25	-0.00573	-0.07354	-0.00002	-0.04957	-0.00578	-0.10742
26	-0.00678	-0.08032	-0.00622	-0.05579	-0.00740	-0.11482
27	-0.00140	-0.08172	-0.00240	-0.05819	-0.00219	-0.11701
28	0.00031	-0.08141	-0.00231	-0.06050	-0.00062	-0.11762
29	0.00037	-0.08104	-0.00154	-0.06204	-0.00051	-0.11813
30	-0.00293	-0.08398	-0.00265	-0.06469	-0.00357	-0.12170

The Mean Adjusted model shows that AARs are positive 22 days and negative for 39 days. It is further observed that CAAR values are positive for 12 days and negative for only 49 days. In the case of Market Adjusted Model, for the event window of 61 days AAR are positive for 18 days and negative for 43 days. The CAAR values are 100% negative during the event window. The Market model reveals that, out of 61 days, AARs are positive 17 days and negative for 44 days. The CAAR values are negative for all 61 days. The result of all the three models shows negative AAR and CAAR values for the full sample earnings announcement. Further a close observation of all the three portfolios reveals that all the AAR values are negative during the event day for all the three models.

Table 4: The Results of Non-Parametric, Run and Sign Test for the September 2011 Quarter

Run and Sign Test Statistics						
	Mean adjusted model		Market adjusted model		Market Model	
	Run Statistics	Sign statistics	Run Statistics	Sign Statistics	Run Statistics	Sign Statistics
Good News Earnings Announcement						
Before	-1.3181	-1.9206	-0.2776	-1.9206	-1.3181	-2.4327
After	-1.2742	1.0954	-1.6066	-1.0954	-0.1770	1.0954
Over all	-3.1741	-3.7717	0.0091	-1.9764	-3.1741	-4.4901
Bad News Earnings Announcement						
Before	-0.3484	-0.6402	0.1010	-3.2009	-1.0348	-2.6888
After	-2.3445	1.0954	0.9203	-1.4606	-2.3445	-0.7303
Over all	-3.4243	-1.9757	0.0091	-3.0533	-3.4243	-3.0533

Full Sample Earnings Announcement						
Before	-1.4864	-2.1766	-0.2776	-3.2009	-1.4864	-3.4570
After	-2.3714	1.0954	-0.5427	-1.8257	-2.3714	0.0000
Over all	-3.1794	-4.1309	0.2355	-2.6941	-3.1741	-4.8493

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 the above table it is observed that under good news, bad news and full sample portfolio, the AAR values of the Mean Adjusted Model and Market model are significant during the entire event window (overall). Therefore we reject the null hypothesis that AAR occur randomly at 5% level of significance for the entire event window (overall).Whereas in the case Market Adjusted Model shows insignificant value for all the three models and we accept the null hypothesis that AAR occur randomly.

The result of sign test reveals that, out of 61 day event window the AAR values of Mean Adjusted Model, Market Adjusted Model and Market Model are significant at 5% level of significance for good, bad and full sample portfolio for the entire event window (overall). Therefore, we reject the null hypothesis that there is no significant difference between the number of positive and negative AARs for the event window of 61days.

Table 5: The Results of t Test for September 2011 Quarter

		Mean Adjusted Model				Market Adjusted Model				Market Model			
		AAR	%	CAAR	%	AAR	%	CAAR	%	AAR	%	CAAR	%
Good News Earnings Announcement													
Before	**S**	8	26.67	26	86.67	1	3.33	30	100.00	6	20.00	17	56.67
	NS	22	73.33	4	13.33	29	96.67	0	0.00	24	80.00	13	43.33
After	**S**	11	35.48	19	61.29	2	6.45	31	100.00	11	35.48	24	77.42
	NS	20	64.52	12	38.71	29	93.55	0	0.00	20	64.52	7	22.58
Over-all	**S**	19	31.15	45	73.77	3	4.92	61	100.00	17	27.87	41	67.21
	NS	42	68.85	16	26.23	58	95.08	0	0.00	44	72.13	20	32.79
Bad News Earnings Announcement													
Before	**S**	8	26.67	24	80.00	5	16.67	25	83.33	7	23.33	17	56.67
	NS	22	73.33	6	20.00	25	83.33	5	16.67	23	76.67	13	43.33
After	**S**	13	41.94	9	29.03	7	22.58	31	100.00	13	41.94	28	90.32
	NS	18	58.06	22	70.97	24	77.42	0	0.00	18	58.06	3	9.68

Over-all	**S**	21	34.43	33	54.10	12	19.67	56	91.80	20	32.79	45	73.77
	NS	40	65.57	28	45.90	49	80.33	5	8.20	41	67.21	16	26.23
Full Sample Earnings Announcement													
Before	**S**	11	36.67	12	40.00	3	10.00	22	73.33	9	30.00	21	70.00
	NS	19	63.33	18	60.00	27	90.00	8	26.67	21	70.00	9	30.00
After	**S**	15	48.39	24	77.42	4	12.90	29	93.55	15	48.39	28	90.32
	NS	16	51.61	7	22.58	27	87.10	2	6.45	16	51.61	3	9.68
Over-all	**S**	26	42.62	36	59.02	7	11.48	51	83.61	24	39.34	49	80.33
	NS	35	57.38	25	40.98	54	88.52	10	16.39	37	60.66	12	19.67

Note: S - significant, NS – Non significant at 5% level of significance. Before– before the event day, After– after the event day and Overall – event window of 61 days.

From the above tableit is clear that under good and bad news and full sample portfolio, the AAR values are insignificant for the entire event window in Mean Return Adjusted Model, Market Adjusted Model and Market model. Therefore, we accept the null hypothesis that AARs are close to zero. The t values of CAAR indicate that for all the three models, they are significant for majority of the days for good, bad and full sample portfolios. Thus we reject the null hypothesis that CAAR values are close to zero for the entire event window. The t values of CAAR reflect the delayed price response and this implies that the prices do not reflect the information content of the quarterly earnings announcements. Therefore based on the above result we conclude that the market gives opportunity to earn the abnormal profits by trading on the basis of quarterly earnings announcement. This result shows that Indian market is inefficient in semi-strong form of EMH.

Conclusion

In this study, we observed daily stock return data of sample companies using the event study methodology. The abnormal performance is measured by using, the Mean Adjusted Returns, Market Adjusted Returns, and Market Model. This study investigated the impact of a quarterly earnings announcement on security returns. The results from event methodology shows that AAR and CAAR values are negative for majority of the days during the event window and the earnings announcement had a negative impact on the market. The Run test reveals that the AAR values of the Mean Adjusted Model and Market model are significant and AAR values of Market Adjusted model are insignificant during the entire event window for good, bad and full sample portfolio.The result of sign test shows that the AAR values of Mean Adjusted Model, Market Adjusted Model and Market Model are significant at 5% level of significance for good, bad and full sample portfolio for the entire event window. The t test result for all the three models shows that AAR values are insignificant for a large number of days and therefore, we accept the null hypothesis that AAR values are close to zero. The t values of CAAR are statistically significant for majority of days during the event window of 61 days. The analysis of the above result shows that there is a scope for abnormal profits. Therefore, we conclude that the Indian stock market is not efficient in the semi-strong form. The quarterly earnings announcement information can be used by the investors to earn abnormal profits. Our study shows that trading on the basis of quarterly earnings information is profitable to the investors in Indian stock market. These results are contradicts the findings of Fama (1965, 1970) and Fama, et al., (1969). The results of this study are similar to those oBernard and Thomas (1990, 1989), Ball and Kothari (1991),Bartov (1992), Bamber and Cheon (1995), Sanjoy (1975), Mallikarjunappa (2004) and Iqbal and Mallikarjunappa (2007, 2008a, 2008b, 2010).

Scope for further Research

This study examined the market reactions to the quarterly earnings announcements by taking the BSE-200 index based companies. The question of using a larger sample set can be taken up for further work. The market efficiency can also be investigated by taking up the market reactions to other corporate actions. There is also scope to study the long run stock price reactions.

Limitations

This study used only 200 companies while 5076 companies are listed on the BSE. One of the problems is that many companies are not traded regularly and therefore, studying these companies is a problem. We have investigated only the short run price reactions.

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About the Authors:

Dr. T. Mallikarjunappa is a Professor at Dept. of Business Administration, Mangalore University, Mangalore. The author can be reached at Email: tmmallik@yahoo.com

Janet Jyothi D'souza is a Research scholar at Dept. of Business Administration, Mangalore University, Mangalore. The author can be reached at Email: janetjyothidsouza@gmail.com