Indian Stock Market Reaction To The Quarterly Earnings Information

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INTRODUCTION

In a semi-strong form efficient market, securities prices adjust instantaneously to publicly available new information and no excess returns can be earned by trading on that information. A number of studies in the U.S., the U.K., and Australian stock markets have examined stock prices reaction to quarterly earnings announcements. But very few studies were conducted on the Indian stock market. Therefore, there is a need for an empirical investigation of stock prices reaction to quarterly earnings announcements.

REVIEW OF LITERATURE

The studies on semi-strong form of efficient market hypothesis in Indian stock market yielded mixed results. A few studies [Rao (1994), Srinivasan (1997), Manickaraj (2004)] concluded that Indian market is semi-strong form efficient. There are a few studies, which questioned semi-strong form efficiency of Indian stock market [Obaidullah (1992), Rao and Manickaraj (1993), Kakati (2001), Lukose and Rao (2002), Mallikarjunappa and Iqbal (2003) and Mallikarjunappa (2004 a, b), and Iqbal (2005)].

OBJECTIVES OF THE STUDY AND HYPOTHESES

Objectives of the Study

This study was conducted with the following objectives: 1. To test whether the semi-strong form of efficient market hypothesis holds in the Indian stock market. 2. To empirically investigate adjustment of stock prices to earnings information.

Hypotheses

Since this study examines the semi-strong form of efficient market hypothesis, the hypotheses are being tested by taking the quarterly earnings announcements as an event. 1. The responses 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.

SAMPLE, DATA AND METHODOLOGY

Sample

Companies which have 20 percent foreign holdings and are traded on the Bombay Stock Exchange for more than 40 percent of the trading days during the year were selected. Further, companies should have announced the quarterly earnings during the December 2001 quarter (quarter selected for this study). This resulted in 152 companies being selected as sample for the study.

Portfolio Construction

The method used for the classification of companies into portfolio consists of dividing the companies into groups on the basis of percentage changes in quarterly earnings (net profit) and net sales. The percentage changes in net earnings in the current quarter over corresponding quarter in the previous year are ascertained in the following way:

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*(Current quarter net earnings – Corresponding quarter net earnings in the previous year)/ Corresponding quarter net earnings in the previous year * 100*

The percentage changes in net sales in the current quarter over corresponding quarter in the previous year are ascertained in the following way:

*(Current quarter net sales – Corresponding quarter net sales in the previous year)/ Corresponding quarter net sales in the previous year * 100*

The first portfolio includes firms with positive percentage change in net earnings (net profit) and net sales, "good news" portfolio. The second portfolio contains firms with negative percentage change in net earnings (net profit) and net sales, "bad news" portfolio. The third is the overall portfolio, which includes all the firms selected as sample for the study.

METHODOLOGY

In this study, the date of quarterly earnings announcement is defined as day 0 or 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).

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

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + e_{it} \qquad \text{for i = 1,...N}$$

We need the values of α_i and β_i to estimate the expected returns. Therefore, the following simplified model of regression is used for estimating the returns on each security by taking the actual returns on market, R_{mt}.

$$\textit{Expected Return} = E(R_{it}) = \alpha_i + \beta_i R_{mt}$$

The abnormal returns are computed using the following model:

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

The following model is used for computing the average abnormal returns (AARs):

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

Generally, if market is efficient, the CAAR should be close to zero [Brown and Warner (1980, 1985), Fuller and Farrell, Jr., (1987, p.105), Mallikarjunappa and Iqbal (2003), Mallikarjunappa (2004a, b)]. The model used to ascertain CAAR is:

$$CAAR_t = \sum_{t=-30}^{K} AAR_{it} \qquad \text{Where t = -30,...0, ... +30.}$$

Beta is calculated using following equation:

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

PARAMETRIC SIGNIFICANCE TEST

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 t- test statistics for AAR for each day during the event window is calculated as:

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

The t statistics for CAAR for each day during the event window is calculated by using the following formula:

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

The standard error is calculated by using the following formula:

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

NON-PARAMETRIC SIGNIFICANCE TEST

Runs Test

Runs test is performed to test the null hypothesis that AARs occur randomly.

Mean number of runs to be computed using the following method:

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

The standard error of the expected number of runs can be computed by using the following formula:

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

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

We 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.

First we have to calculate the standard error of the proportion (σ_p):

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

To compute the value of sign test, we used the following equation:

$$Z = \frac{\bar{p} - p_{Ho}}{\sigma_p}$$

EMPIRICAL RESULTS AND DISCUSSION

The empirical results of the study are shown in Tables 1 to 3. Table 1 shows AARs and CAARs of good news, bad news and overall portfolios respectively. An examination of Table 1 reveals that for good news portfolio, both under market model with raw returns and market model with log returns AARs are negative for 15 days (50%) and positive for the remaining 50% of the days before the event day. After the event day, AARs are negative for 13 days (41.94%) and positive for 18 days (58.06%) under both the models. For good news portfolio, the negative AARs for 41.94% of the days (13 days out of 31 days) after the announcement of quarterly earnings indicate that the stock price movements are not in the right direction.During the event window of 61 days, AARs are negative for 26 days (42.62%) and positive for 35 days (57.38%) under the market model with raw returns and negative for 28 days (45.90%) and positive for remaining 33 days (54.10%) under market model with log returns.

It is evident from Table 1 that CAARs are negative for 7 days (23.33%) and 9 days (30%) and positive for the remaining days under market model with raw returns and log returns respectively before the event day. After the event day, they are positive for 31 days (100%) under both the models. For the event window of 61 days, CAARs are negative 7 days (11.48%) and 9 days (14.75%) and positive for 54 days (88.52%) and 52 (85.75%) under market model with raw and log returns respectively for good news portfolio.

The results presented in Table 1 suggest that for bad news portfolio, AARs are negative for 18 days (60%) and positive for 12 days (40%) before the event day under both market model with raw and log returns. After the event day, AARs are negative for 13 days (41.94%) and positive for 18 days (58.06%) under both the models. Out of 61 days, AARs are negative for 31 days (50.82%) and positive for 30 days (49.18%) under both the models.

Table 1: AARs and CAARs surrounding the event for December 2001 quarter

	Market Model with Raw Returns						Market Model with Log Returns					
Days	Good News Portfolio		Bad News Portfolio		Overall Portfolio		Good News Portfolio		Bad News Portfolio		Overall Portfolio	
	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR	AAR	CAAR
-30	0.75693	0.75693	0.10448	0.10448	0.40924	0.40924	0.00671	0.00671	0.00073	0.00073	0.00352	0.00352
-29	0.36718	1.12410	0.03286	0.13734	0.18902	0.59827	0.00341	0.01012	0.00007	0.00079	0.00163	0.00515
-28	0.79799	1.92210	-1.41142	-1.27408	-0.37939	0.21887	0.00754	0.01766	-0.01539	-0.01460	-0.00468	0.00047
-27	0.01432	1.93642	-0.47021	-1.74429	-0.24388	-0.02501	-0.00048	0.01718	-0.00503	-0.01963	-0.00291	-0.00244
-26	-0.00866	1.92776	-0.27363	-2.01792	-0.14986	-0.17487	-0.00051	0.01666	-0.00397	-0.02360	-0.00236	-0.00480
-25	-1.16255	0.76521	0.68166	-1.33626	-0.17978	-0.35466	-0.01158	0.00508	0.00656	-0.01705	-0.00192	-0.00671
-24	-0.12721	0.63800	-0.07105	-1.40731	-0.09728	-0.45194	-0.00219	0.00288	-0.00151	-0.01856	-0.00183	-0.00854
-23	-0.03087	0.60713	0.17373	-1.23358	0.07816	-0.37378	-0.00035	0.00254	0.00120	-0.01736	0.00048	-0.00806
-22	-0.11947	0.48767	0.11566	-1.11792	0.00583	-0.36794	-0.00088	0.00166	0.00023	-0.01713	-0.00029	-0.00835
-21	-1.22214	-0.73448	-0.21146	-1.32938	-0.68356	-1.05150	-0.01240	-0.01073	-0.00339	-0.02051	-0.00760	-0.01595
-20	-0.07510	-0.80958	0.14840	-1.18099	0.04400	-1.00750	-0.00075	-0.01148	0.00208	-0.01843	0.00076	-0.01519
-19	-0.40484	-1.21442	-1.38656	-2.56755	-0.92799	-1.93550	-0.00412	-0.01560	-0.01447	-0.03290	-0.00964	-0.02482
-18	-0.47897	-1.69339	-0.07191	-2.63946	-0.26205	-2.19754	-0.00422	-0.01982	-0.00088	-0.03378	-0.00244	-0.02726
-17	0.68977	-1.00362	1.23283	-1.40663	0.97917	-1.21838	0.00704	-0.01278	0.01222	-0.02156	0.00980	-0.01746
-16	0.64793	-0.35569	0.07844	-1.32818	0.34445	-0.87393	0.00588	-0.00690	0.00061	-0.02095	0.00307	-0.01439
-15	1.71235	1.35666	-0.43137	-1.75955	0.56997	-0.30395	0.01626	0.00937	-0.00407	-0.02503	0.00543	-0.00896
-14	-0.94500	0.41166	-0.73799	-2.49754	-0.83469	-1.13864	-0.01062	-0.00126	-0.00739	-0.03242	-0.00890	-0.01786
-13	-0.54778	-0.13612	-0.32782	-2.82536	-0.43056	-1.56920	-0.00520	-0.00646	-0.00332	-0.03573	-0.00420	-0.02206
-12	0.70365	0.56753	-0.42957	-3.25493	0.09976	-1.46944	0.00683	0.00037	-0.00435	-0.04009	0.00087	-0.02119
-11	-0.30295	0.26458	0.46160	-2.79333	0.10448	-1.36496	-0.00334	-0.00298	0.00419	-0.03590	0.00067	-0.02052
-10	0.51495	0.77953	-1.00209	-3.79542	-0.29347	-1.65844	0.00508	0.00210	-0.01059	-0.04649	-0.00327	-0.02379
-9	0.20236	0.98189	-0.09290	-3.88832	0.04502	-1.61342	0.00188	0.00398	-0.00071	-0.04720	0.00050	-0.02329
-8	0.22673	1.20863	-0.57786	-4.46617	-0.20203	-1.81544	0.00199	0.00597	-0.00608	-0.05328	-0.00231	-0.02561
-7	0.90945	2.11808	-0.29051	-4.75668	0.27000	-1.54545	0.00892	0.01489	-0.00405	-0.05734	0.00201	-0.02360
-6	-0.24480	1.87328	0.43597	-4.32071	0.11798	-1.42746	-0.00239	0.01250	0.00349	-0.05384	0.00074	-0.02285
-5	0.10118	1.97446	0.37395	-3.94676	0.24654	-1.18093	0.00083	0.01333	0.00341	-0.05043	0.00220	-0.02065
-4	0.71836	2.69281	0.81836	-3.12840	0.77165	-0.40928	0.00762	0.02095	0.00787	-0.04256	0.00776	-0.01290
-3	0.44394	3.13675	-1.33103	-4.45943	-0.50193	-0.91121	0.00426	0.02521	-0.01385	-0.05640	-0.00539	-0.01828
-2	0.79289	3.92964	-1.31976	-5.77919	-0.33293	-1.24415	0.00802	0.03323	-0.01380	-0.07021	-0.00361	-0.02189
-1	-0.18259	3.74705	-0.09330	-5.87249	-0.13501	-1.37915	-0.00234	0.03089	-0.00098	-0.07119	-0.00162	-0.02351
0	-0.09410	3.65295	-0.09384	-5.96633	-0.09396	-1.47312	-0.00136	0.02953	-0.00015	-0.07134	-0.00072	-0.02422
1	2.25618	5.90913	0.69516	-5.27117	1.42432	-0.04879	0.02182	0.05135	0.00658	-0.06476	0.01370	-0.01052
2	-0.38512	5.52401	-0.42000	-5.69117	-0.40371	-0.45250	-0.00422	0.04713	-0.00469	-0.06945	-0.00447	-0.01500
3	-0.21704	5.30697	-0.22733	-5.91850	-0.22252	-0.67502	-0.00228	0.04484	-0.00256	-0.07201	-0.00243	-0.01743
4	0.55446	5.86142	0.19449	-5.72400	0.36263	-0.31239	0.00546	0.05031	0.00144	-0.07057	0.00332	-0.01411
5	-0.36129	5.50013	-0.87400	-6.59800	-0.63451	-0.94690	-0.00334	0.04697	-0.00881	-0.07938	-0.00626	-0.02036
6	0.47735	5.97748	0.77284	-5.82517	0.63481	-0.31209	0.00512	0.05209	0.00731	-0.07207	0.00629	-0.01408
7	0.74302	6.72051	-0.35237	-6.17754	0.15929	-0.15280	0.00737	0.05945	-0.00382	-0.07589	0.00141	-0.01267
8	1.00685	7.72736	0.07476	-6.10278	0.51015	0.35735	0.01006	0.06952	0.00074	-0.07516	0.00509	-0.00758
9	-0.18125	7.54611	0.93025	-5.17253	0.41106	0.76841	-0.00193	0.06759	0.00895	-0.06621	0.00387	-0.00371
10	-0.24108	7.30502	0.60674	-4.56579	0.21072	0.97913	-0.00261	0.06498	0.00595	-0.06026	0.00195	-0.00176
11	0.47969	7.78472	-0.94764	-5.51343	-0.28093	0.69820	0.00440	0.06938	-0.00946	-0.06972	-0.00299	-0.00475
12	0.62313	8.40785	0.61397	-4.89946	0.61825	1.31645	0.00593	0.07531	0.00626	-0.06346	0.00611	0.00136
13	0.12407	8.53192	1.62581	-3.27365	0.92434	2.24080	0.00079	0.07610	0.01632	-0.04714	0.00907	0.01043
14	0.07665	8.60857	0.95273	-2.32092	0.54351	2.78430	-0.00002	0.07608	0.00916	-0.03798	0.00487	0.01530
15	0.53836	9.14693	0.23407	-2.08685	0.37621	3.16051	0.00502	0.08110	0.00174	-0.03624	0.00327	0.01857
16	0.72209	9.86902	0.46000	-1.62685	0.58242	3.74293	0.00698	0.08808	0.00405	-0.03218	0.00542	0.02399
17	0.56319	10.43221	0.55965	-1.06720	0.56130	4.30424	0.00522	0.09330	0.00543	-0.02675	0.00533	0.02933
18	-0.91013	9.52208	0.83100	-0.23620	0.01771	4.32194	-0.00920	0.08410	0.00745	-0.01930	-0.00033	0.02900
19	0.22091	9.74299	0.70264	0.46644	0.47762	4.79956	0.00191	0.08601	0.00624	-0.01306	0.00422	0.03321
20	-0.49500	9.24799	-0.16504	0.30139	-0.31917	4.48040	-0.00525	0.08076	-0.00161	-0.01467	-0.00331	0.02990
21	0.28805	9.53605	-0.41068	-0.10929	-0.08430	4.39610	0.00259	0.08335	-0.00435	-0.01902	-0.00111	0.02880
22	1.03590	10.57195	-0.76681	-0.87610	0.07524	4.47134	0.00998	0.09333	-0.00801	-0.02703	0.00039	0.02919
23	-0.13672	10.43522	-1.90107	-2.77717	-1.07693	3.39441	-0.00127	0.09206	-0.01897	-0.04600	-0.01070	0.01849
24	0.57094	11.00616	0.42539	-2.35178	0.49338	3.88778	0.00536	0.09741	0.00423	-0.04177	0.00476	0.02325
25	0.07905	11.08521	0.92525	-1.42653	0.52999	4.41777	0.00093	0.09834	0.00909	-0.03268	0.00528	0.02852
26	-0.10073	10.98448	-0.12659	-1.55312	-0.11451	4.30326	-0.00122	0.09712	-0.00117	-0.03384	-0.00119	0.02733
27	-0.70497	10.27951	-0.44253	-1.99565	-0.56512	3.73814	-0.00701	0.09011	-0.00458	-0.03843	-0.00572	0.02162
28	0.80800	11.08751	0.94590	-1.04974	0.88149	4.61963	0.00776	0.09787	0.00956	-0.02887	0.00872	0.03033
29	0.13803	11.22555	0.29499	-0.75476	0.22167	4.84131	0.00190	0.09977	0.00312	-0.02575	0.00255	0.03288
30	-0.11566	11.10989	-1.17571	-1.93047	-0.68055	4.16075	-0.00013	0.09964	-0.01180	-0.03755	-0.00635	0.02653

Notes:

1. Good News Portfolio: The firms with positive percentage change in net earnings and net sales.
2. Bad News Portfolio: The firms with negative percentage change in net earnings and net sales.
3. Overall Portfolio: All the firms selected as samples for the study.
4. AARs show the values of average abnormal returns.
5. CAARs show the cumulative average abnormal returns, which are computed for days -30 through 30.
6. Day -30 to -1: The days before the quarterly earnings announcement.
7. Day 0: The day of the quarterly earnings announcement.
8. Day 1 to 30: The days after the quarterly earnings announcement

A close look at Table 1 reveals that for bad news portfolio, CAARs are negative for 28 days (93.33%) and positive for 2 days (6.67%) before the event day. As against this after the event day they are negative for as high as 29 days (93.55%) and 31 days (100%) respectively under both the models. During the event window of 61 days, CAARs are negative for as high as 57 days (93.44%) and 59 days (96.72%) and positive for the remaining days.

Table 1 indicates that for the overall portfolio (out 30 days before the event day), 15 days (50%) AARs are positive and negative respectively and after the event day, out of 31 days, they are negative for 12 days (38.71%) and positive for the remaining days under both - market model with raw and log returns. During the event window of 61 days, AARs are negative for 27 days (44.26%) and positive for remaining 34 days (55.74%).

The results presented in Table 1 show that for the overall portfolio, CAARs are negative for as high as 27 days (90%) and positive for as low as 3 days (10%) under market model with raw and log returns before the event day as against negative for 8 days and 12 days after the event day. CAARs are positive for 23 days and 19 days under market model with raw and log returns respectively after the event day. Out of 61 days, CAARs are negative for 35 days (57.38%) and positive for 26 days (42.62%) under market model with raw returns as against 39 days (63.93%) and 22 days (36.07%) respectively under market model with log returns.

To test null hypothesis that AARs are occurring randomly, we calculated Runs statistics on AARs before and after the event day and the results are presented in Table 2. A glance at Table 2 reveals that for all the three portfolios (good news, bad news and overall portfolio) under market model with raw returns and with log returns, the computed Runs test values are less than the critical value of ±1.96 after the event day and for bad news and overall portfolio before the event day. Therefore, we accept null hypothesis that AARs occurs randomly for bad news and overall portfolio both before and after the event day and for good news portfolio after the event day. However, for good news portfolio before the event day, the calculated Runs statistics –2.21509 under market model with raw returns and –2.22967 under market model with log returns are greater than the critical value of ± 1.96. Therefore, we reject the null hypothesis that AARs occur randomly before the event day for good news portfolio under both – market model with raw and log returns.

There are negative and positive AARs before and after the event day for all the three portfolios. To test if there is any significant difference between the number of positive and negative AARs, we calculated the sign values. The sign test statistics that is shown in Table 2 indicates that the computed value of Z is less than the critical value of ± 1.96 for all the three portfolios for the entire event window of 61 days. Therefore, we accept the null hypothesis that there is no significant difference between the number of positive and negative AARs.

Table 2: Runs and Sign Test Statistics for the quarter

	Market Model with Raw Returns			Market Model with Log Returns		
	Runs	Runs Statistics	Sign Statistics	Runs	Runs Statistics	Sign Statistics
Good News Portfolio						
Before	10	-2.21509	0.36515	10	-2.22967	0.00000
After	17	0.49767	1.25724	19	1.09003	0.89803
Overall	27	-1.01303	1.15233	29	-0.59675	0.64018
Bad News Portfolio						
Before	14	-0.54274	-1.09545	14	-0.54274	-1.09545
After	15	-0.41179	0.89803	15	-0.41179	0.89803
Overall	29	-0.64365	-0.12804	29	-0.64365	-0.12804
Overall Portfolio						
Before	14	-0.7432	0.0000	14	-0.7218	-0.3651
After	15	-0.0775	1.6164	17	0.4977	1.2572
Overall	29	-0.4849	1.1523	31	-0.0767	0.6402

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.

We used t-test on AARs and CAARs to verify whether AARs and CAARs are close to zero and the results are presented in Table 3.

Table 3: t-Test Statistics on AARs and CAARs for the quarter

	Market Model with Raw Returns				Market Model with Log Returns			
	AAR	%	CAAR	%	AAR	%	CAAR	%
Good News Portfolio								
Bef-RT	1	33.33	22	78.57	2	50.00	15	65.22
Bef-LT	2	66.67	6	21.43	2	50.00	8	34.78
Aft-RT	2	66.67	31	100.00	2	100.00	31	100.00
Aft-LT	1	33.33	0	0.00	0	0.00	0	0.00
Tot-RT	3	50.00	53	89.83	4	66.67	46	85.19
Tot-LT	3	50.00	6	10.17	2	33.33	8	14.81
Bad News Portfolio								
Bef-RT	1	20.00	0	0.00	1	20.00	0	0.00
Bef-LT	4	80.00	28	100.00	4	80.00	28	100.00
Aft-RT	1	33.33	2	6.67	1	33.33	0	0.00
Aft-LT	2	66.67	28	93.33	2	66.67	31	100.00
Tot-RT	2	25.00	2	3.45	2	25.00	0	0.00
Tot-LT	6	75.00	56	96.55	6	75.00	59	100.00
Overall Portfolio								
Bef-RT	2	50.00	1	3.85	2	50.00	0	0.00
Bef-LT	2	50.00	25	96.15	2	50.00	26	100.00
Aft-RT	3	60.00	23	76.67	3	75.00	19	61.29
Aft-LT	2	40.00	7	23.33	1	25.00	12	38.71
Tot-RT	5	55.56	24	42.86	5	62.50	19	33.33
Tot-LT	4	44.44	32	57.14	3	37.50	38	66.67

Notes:

1. Bef-RT, Bef-LT, Aft-RT, Aft-LT indicates the number of t-values that form 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 t-values that fall in the right (RT) and left tail (LT) of the rejection region for the event window.

A glance at Table 3 shows that the t-values on AAR indicates that for less than 9 (14.75%) days, computed t-values falls in the rejection region and for the remaining days, they are within the acceptance region. This indicates that AARs are close to zero for more than 85% of the days and therefore, no trader could earn abnormal returns by trading on a daily basis for more than 85% of the days.

However, the t-test on CAARs reveals that t-values are significant at 5% level for more than 54 days (88.52%) out of 61 days and for the remaining only 7 days (11.48%) they are not significant. This indicates that for more than 88% of the days, the CAARs are not close to zero. Therefore, we conclude that Indian stock market reactions to the quarterly earnings information are not quick and abnormal returns persist several days after the earnings announcement.

CONCLUSION

This paper examines stock market reaction to the earnings announcements by taking December 2001 quarter earnings announcement as an event. The study is based on 152 companies having minimum 20 percent foreign holdings. The companies are divided into good news, bad news and overall portfolios. The behaviour of AARs and CAARs are examined for 30 days before and 31 days after the announcement of quarterly earnings information. To test the null hypothesis that AARs are occurring randomly, we calculated Runs statistics on AARs before and after the event day. The results reveals that for all the three portfolios (good news, bad news and overall portfolio) under market model with raw returns and with log returns, the computed Runs test values are less than the critical value of ±1.96 after the event day and for bad news and overall portfolio both before and after the event day. Therefore, we accept null hypothesis that AARs occur randomly for bad news and overall portfolio both before and after the event day and AARs occur randomly for good news portfolio after the event day. However, for good news portfolio before the event day, calculated Runs statistics were –2.21509 under market model with raw returns and –2.22967 under market model with log returns are greater than the critical value of ± 1.96. Therefore, we reject the null

hypothesis that AARs occur randomly before the event day for good news portfolio under both – market model with raw and log returns.

To test if there is any significant difference between the number of positive and negative AARs, we calculated sign values. The sign test statistics indicates that the computed value of Z is less than the critical value of ± 1.96 for all the three portfolios for the entire event window of 61 days. Therefore, we accept the null hypothesis that there is no significant difference between the number of positive and negative AARs.

We used t-test on AARs and CAARs to verify whether AARs and CAARs are close to zero. The t-values on AARs indicate that for less than 9 (14.75%) of days, computed t-values falls in the rejection region and for the remaining days, they are within the acceptance region. This indicates that AARs are close to zero for more than 85% of the days and therefore, no trader could earn abnormal returns by trading on daily basis for more than 85% of the days. The results of t-test on CAARs indicate that CAARs are significant for the majority of the days for all the three portfolios under both – market model with raw and log returns. This indicates that CAARs are greater than zero for majority of the days during the event window and Indian stock market reaction to quarterly earnings information is slow and contradicts semi-strong form of efficient market hypothesis.

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APPENDIX

Table 4: Companies selected for the study

3M India Ltd.	Godfrey Phillips India Ltd.	Mphasis B F L Ltd.
A B B Ltd.	Goetze (India) Ltd.	Munjal Showa Ltd.
A F T Industries Ltd.	Goodlass Nerolac Paints Ltd.	N I I T Ltd.
Aban Loyd Chiles Offshore	Goodricke Group Ltd.	Novartis India Ltd.
Aegis Logistics Ltd.	Grasim Industries Ltd.	Ondeo Nalco India Ltd.
Albright & Wilson Chemical	Greaves Morganite Crucible Ltd.	Panasonic A V C Networks
Arvind Mills Ltd.	Grindwell Norton Ltd.	Polyplex Corporation Ltd.
Asahi India Glass Ltd.	Gujarat Ambuja Cements Ltd.	P& G Hygiene & Health Care
Ashok Leyland Ltd.	Gujarat Sidhee Cement Ltd.	Ranbaxy Laboratories Ltd.
Asian Paints (India) Ltd.	Gulf Oil Corpn. Ltd.	Ras Propack Lamipack Ltd.
Assam Co. Ltd.	H C L Technologies Ltd.	Reliance Industries Ltd.
Astrazeneca Pharma India	H D F C Bank Ltd.	Royal Cushion Vinyl Product
Atlas Copco (India) Ltd.	Harrisons Malayalam Ltd.	S K F Bearings India Ltd.
Aventis Pharma Ltd.	Henkel Spic India Ltd.	Satyam Computer Services
Avery India Ltd.	Hero Honda Motors Ltd.	Saurashtra Cement Ltd.
B O C India Ltd.	Hindalco Industries Ltd.	Saw Pipes Ltd.
Bajaj Auto Ltd.	Hindustan Lever Ltd.	Schlafhorst Engineering
Balaji Telefilms Ltd.	Hindustan Petroleum Corpn.	Sesa Goa Ltd.
Ballarpur Industries Ltd.	Hindustan Powerplus Ltd.	Siemens Ltd.
Balmer Lawrie-Van Leer	HDFC	Siemens V D O Automotive
Banco Products (India) Ltd.	Hughes Software Systems Ltd.	Singer India Ltd.
Bharat Heavy Electricals	I C I C I Bank Ltd.	Sona Koyo Steering Systems
Birla Ericsson Optical Ltd.	I C I India Ltd.	Steelco Gujarat Ltd.
Birla Kennametal Ltd.	I N G Vysya Bank Ltd.	Sterling Biotech Ltd.
Castrol India Ltd.	I T C Ltd.	Sterlite Optical Technologies
Ceekay Daikin Ltd.	Igate Global Solutions Ltd.	Stovec Industries Ltd.
Century Enka Ltd.	India Gelatine & Chemicals Ltd.	Subros Ltd.
Ciba Specialty Chemicals	India Gypsum Ltd.	Sundaram-Clayton Ltd.
Cipla Ltd.	Indo Matsushita Appliances Co.	Sunflag Iron & Steel Co. Ltd.
Clariant (India) Ltd.	Indo Matsushita Carbon Co. Ltd.	Switching Technologies Gunther
Coates Of India Ltd.	Indo National Ltd.	Tarai Foods Ltd.
Colour-Chem Ltd.	Indo Rama Synthetics (India) Ltd.	Tata Motors Ltd.
Crisil Ltd.	Infosys Technologies Ltd.	Tata Telecom Ltd.
D G P Windsor India Ltd.	Ingersoll-Rand (India) Ltd.	Thomas Cook (India) Ltd.
Denso India Ltd.	Insilco Ltd.	Timex Watches Ltd.
Dr. Reddy's Laboratories Ltd.	Jai Parabolic Springs Ltd.	Timken India Ltd.
Ennore Foundries Ltd.	Jammu & Kashmir Bank Ltd.	Titanor Components Ltd.
Esab India Ltd.	Jindal Iron & Steel Co. Ltd.	Tudor India Ltd.
E-Serve International Ltd.	Jindal Steel & Power Ltd.	U T I Bank Ltd.
Essel Propack Ltd.	Kennametal Widia India Ltd.	Usha Martin Ltd.
Exide Industries Ltd.	Kerala Chemicals & Proteins Ltd.	V S T Industries Ltd.
F A G Bearings India Ltd.	Krone Communications Ltd.	Venlon Polyester Film Ltd.
F G P Ltd.	Larsen & Toubro Ltd.	Vesuvius India Ltd.
Foseco India Ltd.	Lupin Ltd.	Vickers Systems International
G M M Pfaudler Ltd.	Mahanagar Telephone Nigam Ltd.	Warren Tea Ltd.
Gabriel India Ltd.	Mahindra & Mahindra Ltd.	Wartsila India Ltd.
Gammon India Ltd.	Mather & Platt (India) Ltd.	Wyeth Ltd.
Gillette India Ltd.	Merck Ltd.	Yokogawa Blue Star Ltd.
Ginni Filaments Ltd.	Monsanto India Ltd.	Zee Telefilms Ltd.
GlaxosmithklineConsumer & Health Care Ltd.	Moser Baer India Ltd.	Zensar Technologies Ltd.
		Zodiac Clothing Co. Ltd.
		Zuari Industries Ltd.