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Earnings Information and Stock Market Efficiency

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Abstract

This paper examines earnings information and stock market efficiency in Bahrain by taking annual earnings announcement as an event. The study is based on 32 companies listed on Bahrain Bourse. We have used event study methodology and t test. The behaviour of AARs and CAARs are examined for 30 days before and 31 days after the announcement of annual earnings. The results of the study contradict semi-strong form of efficient market hypothesis.

Keywords: efficient market hypothesis; abnormal returns; stock market; market efficiency.

1. Introduction

The speed and accuracy of stock price adjustment is important to consider any stock market as an efficient market. Both under reaction and overreaction to new price sensitive information would offer an opportunity to investors to systematically beat the market and earn abnormal returns, which is inconsistent with semi-strong form of efficient market hypothesis .

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There have been a number of contradictory findings the majority of researchers concluded that the stock markets of the U.K. and the U.S. are semi-strong form of efficient. According to [11] Bahrain Bourse is not efficient in semi string form and response of stock earnings are delayed. The studies on Indian stock market by [15,16,17,18,19], found that there were abnormal returns after the announcement of earnings. The results of the studies conducted by [20,21,23,24] revealed that Indian stock market is slow in reacting to earnings announcements and provides opportunity for excess returns. The empirical studies conducted by [25,26], and [27], found that the Indian stock market is slow in reacting to quarterly earnings announcements and provide an opportunity to earn excess return.

Although there have been a number of contradictory findings, which are mentioned above, the majority of research conclude that the stock markets of the U.K. and the U.S. are efficient in semi-strong form. The studies by [1,3,5] assessed the behaviour of security prices when firm's quarterly reports are announced and the results are consistent with semi-strong form of EMH. According to [2,6,7] the size of price changes surrounding the announcement of a firm's annual earnings. These results provided substantial evidence that the reaction occurs quickly.

There is almost no research on Bahrain Bourse except empirical testing of capital asset pricing on Bahrain Bourse by [22] reaction of Bahrain Bourse to announcement of annual financial results by [11], the cross sectional variation of portfolio returns by [10] and the month of the year effect on selected commercial banks and services sector companies by [12]. Therefore, this paper focuses on the stock price reactions to annual earnings announcements in Bahrain Bourse and try to contribute input to the regulator.

1.1. Objectives of the Study and Hypotheses

To test whether the semi-strong form of efficient market hypothesis holds in the Bahrain n stock market.

1.2 Hypotheses

Since this study examines the semi-strong form of efficient market hypothesis taking the annual earnings announcements as an event, the hypotheses being tested are:

H1: The responses of stock prices to the annual earnings announcements are complete on the day of the announcement.

H2: The investors cannot earn abnormal returns by trading in the stocks after the annual earnings announcements.

H3: The average abnormal returns and the cumulative average abnormal returns are close to zero.

2. Methodology

In this study, the date of annual 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. Market model was developed and suggested by Sharpe (1963). Mathematically market model can be expressed as:

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

We need the values of $\propto_i$ 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}.

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

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 The model used to ascertain CAAR is:

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

2.1 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:

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

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

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

The standard error is calculated by using following formula:

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

3. Empirical Results and Discussion

The empirical results of the study are shown in Tables 1 to 2.

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 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.

Table 1: AARs and CAARs surrounding the event during the year

Days	Overall Portfolio		Overall Portfolio		
	CAAR	**AAR**	**CAAR**	**AAR**	**CAAR**
-30	0.10448	0.40924	0.00073	0.00352	0.00352
-29	0.13734	0.18902	0.00079	0.00163	0.00515
-28	-1.27408	-0.37939	-0.01460	-0.00468	0.00047
-27	-1.74429	-0.24388	-0.01963	-0.00291	-0.00244
-26	-2.01792	-0.14986	-0.02360	-0.00236	-0.00480
-25	-1.33626	-0.17978	-0.01705	-0.00192	-0.00671
-24	-1.40731	-0.09728	-0.01856	-0.00183	-0.00854
-23	-1.23358	0.07816	-0.01736	0.00048	-0.00806
-22	-1.11792	0.00583	-0.01713	-0.00029	-0.00835
-31	-1.32938	-0.68356	-0.03051	-0.00760	-0.01595

-30	-1.18099	0.04400	-0.01843	0.00076	-0.01519
-19	-2.56755	-0.92799	-0.03290	-0.00964	-0.02482
-18	-2.63946	-0.26305	-0.03378	-0.00244	-0.02726
-17	-1.40663	0.97917	-0.03156	0.00980	-0.01746
-16	-1.32818	0.34445	-0.03095	0.00307	-0.01439
-15	-1.75955	0.56997	-0.02503	0.00543	-0.00896
-14	-2.49754	-0.83469	-0.03242	-0.00890	-0.01786
-13	-2.82536	-0.43056	-0.03573	-0.00430	-0.02306
-12	-3.25493	0.09976	-0.04009	0.00087	-0.03119
-11	-2.79333	0.10448	-0.03590	0.00067	-0.03052
-10	-3.79542	-0.29347	-0.04649	-0.00327	-0.02379
-9	-3.88832	0.04502	-0.04730	0.00050	-0.02329
-8	-4.46617	-0.30303	-0.05328	-0.00231	-0.02561
-7	-4.75668	0.27000	-0.05734	0.00301	-0.02360
-6	-4.33071	0.11798	-0.05384	0.00074	-0.02285
-5	-3.94676	0.24654	-0.05043	0.00230	-0.03065
-4	-3.12840	0.77165	-0.04256	0.00776	-0.01290
-3	-4.45943	-0.50193	-0.05640	-0.00539	-0.01828
-2	-5.77919	-0.33293	-0.07031	-0.00361	-0.03189
-1	-5.87249	-0.13501	-0.07119	-0.00162	-0.02351
0	-5.96633	-0.09396	-0.07134	-0.00072	-0.02422
1	-5.27117	1.42432	-0.06476	0.01370	-0.01052
2	-5.69117	-0.40371	-0.06945	-0.00447	-0.01500
3	-5.91850	-0.22252	-0.07301	-0.00243	-0.01743
4	-5.72400	0.36263	-0.07057	0.00332	-0.01411
5	-6.59800	-0.63451	-0.07938	-0.00626	-0.03036
6	-5.82517	0.63481	-0.07307	0.00629	-0.01408
7	-6.17754	0.15929	-0.07589	0.00141	-0.01267
8	-6.10278	0.51015	-0.07516	0.00509	-0.00758

9	-5.17253	0.41106	-0.06631	0.00387	-0.00371
10	-4.56579	0.31072	-0.06026	0.00195	-0.00176
11	-5.51343	-0.28093	-0.06972	-0.00299	-0.00475
12	-4.89946	0.61825	-0.06346	0.00611	0.00136
13	-3.27365	0.92434	-0.04714	0.00907	0.01043
14	-2.33092	0.54351	-0.03798	0.00487	0.01530
15	-2.08685	0.37631	-0.03624	0.00327	0.01857
16	-1.62685	0.58242	-0.03318	0.00542	0.02399
17	-1.06730	0.56130	-0.02675	0.00533	0.02933
18	-0.23630	0.01771	-0.01930	-0.00033	0.02900
19	0.46644	0.47762	-0.01306	0.00422	0.03331
30	0.30139	-0.31917	-0.01467	-0.00331	0.02990
31	-0.10929	-0.08430	-0.01902	-0.00111	0.02880
22	-0.87610	0.07524	-0.02703	0.00039	0.02919
23	-2.77717	-1.07693	-0.04600	-0.01070	0.01849
24	-2.35178	0.49338	-0.04177	0.00476	0.02325
25	-1.42653	0.52999	-0.03268	0.00528	0.02852
26	-1.55312	-0.11451	-0.03384	-0.00119	0.02733
27	-1.99565	-0.56512	-0.03843	-0.00572	0.03162
28	-1.04974	0.88149	-0.02887	0.00872	0.03033
29	-0.75476	0.23167	-0.02575	0.00255	0.03288
30	-1.93047	-0.68055	-0.03755	-0.00635	0.02653

The results of t-test carried out on both AARs and CAARs are shown in Table 2. The t-values on AAR shows that for all the three portfolios under both the models significant at 5% level for less than 17 days (27%) and for the remaining more than 44 days (73%) they are not significant. This shows that the AARs are not approximate to zero only for less than 17 days out of 61 days and remaining more than 44 days they are close to zero. This indicates that the market is efficient on the basis of AARs for the majority of the days during the event window period. Table 3 reveals that t-test carried out on CAARs are greater than critical value for more than 55 days (90.16%) during the event window period of 61 days. Therefore, for more than 90.16% of days t-values are

significant and remaining less than 10% of days they are not significant. This makes us to conclude that CAARs are not close to zero for more than 90.16% of the days during the event window and abnormal returns do exist after the announcement of annual earnings. Therefore, we conclude that in Bahrain n stock market stock prices are not instantaneously reflecting earnings information.

Table 2: t-Test Statistics on AARs and CAARs for the quarter

	Market Model with Raw Returns				**Market Model with Log Returns**			
	AAR	**%**	**CAAR**	**%**	**AAR**	**%**	**CAAR**	**%**
Overall Portfolio								
Bef-RT	6	100.00	28	100.00	6	100.00	28	100.00
Bef-LT	0	0.00	0	0.00	0	0.00	0	0.00
Aft-RT	7	100.00	31	100.00	10	100.00	31	100.00
Aft-LT	0	0.00	0	0.00	0	0.00	0	0.00
Tot-RT	13	100.00	59	100.00	16	100.00	59	100.00
Tot-LT	0	0.00	0	0.00	0	0.00	0	0.00

4. Conclusion

This paper examines annual earnings information, stock returns, and stock market efficiency in Bahrain by taking annual earnings announcement as an event. For overall portfolio 26 days (42.62%) and positive for 35 days (57.38%), 30 days (49.18%) and 35 days (57.38%) respectively. Under market model with log returns for good news portfolio during the event window AARs are negative for 28 days (45.90%), for bad news portfolio 31 days (50.82%) and for overall portfolio 28 days (45.90%) and positive for 33 days (54.10%), 30 days (49.18%) and 33 days (54.10%) respectively. CAARs are for the overall portfolios and positive for 54 days (88.52%), 4 days (6.56%) and 26 days (42.62%) respectively under market model with raw returns out of 61 days. This makes us to conclude that CAARs are not close to zero for more than 90.16% of the days during the event window and abnormal returns do exist after the announcement of annual earnings.

5. Limitations of the study and the Recommendations

The results of the study cannot be generalized because the study is based on reactions of only 32 stocks. Moreover, many stocks have infrequent trading. Therefore, to generalize results, more companies and longer study period required. The implication of this study is that investors can benefit from the announcement of annual financial results. The results of the study show that companies are not successful in disseminating the annual earnings information to the investors or due to thin trading immediate reaction is not possible. The findings of the study will help the stock market regulators to initiate measures to ensure market efficiency.

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