Dividend Signalling And Market Efficiency In Emerging Economy: A Study of Indian Stock Market

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Abstract

This paper applies GARCH (p, q) model and non-parametric Run test for studying isolated events of dividend change announcements covering a period of ten years for capturing abnormal returns in the Indian Stock Market using an event window of 61 days. The results indicate that there is no signalling effect of 'dividend increase/decrease along with financial results announcement' event on the share price of companies. Cumulative abnormal return tendency is observed if share purchase is made prior to any of the events. It is also found that adjustment in prices after event date takes place with a substantial time lag reflecting inefficiencies in the market.

Keywords: Signalling effect; market efficiency; dividend announcement; event study; emerging economy

1. Introduction

Examining financial market reaction to various firms specific and market specific events has been the subject matter of numerous studies. Many of these studies have attempted to measure the direction, intensity and impact of events affecting the stock markets. Literature points out to existence of differences in signalling effect of dividend related events in different economies of the world characterised by respective nature and level of market efficiency. India being a prominent emerging economy with a highest number of transactions amongst all the stock exchanges of the world (World Federation of Exchanges, 2013) provides a good example to examine if signalling theory holds and comment upon relative efficiency of the market.

Based on the initial work of Louis Bachelor (1900) that securities price behave randomly, Lintner (1956) proposed a model of asymmetric information and related relevance of dividend payment to earnings performance of the firms. He argued that firms increase dividend payments when they are positively confident of future performance, but are reluctant to decrease dividend payment unless they are convinced of permanent decline of firm's future performance. The theory of signalling effect thus, became relevant to determine whether firms signal their performance through dividend change announcement. Fama et al. (1969) analysed stock price behaviour by using event study method to convey that markets are efficient and the share prices incorporate all available information. Ross (1977), Bhattacharya (1979), John and Williams (1985), Miller & Rock (1985) focused on share price behaviour and argued that managers use different types of information including dividend related to convey change in value perception of the firm.

Empirical results in the direction of signalling theory abound. In studies on US market, Pettit (1972) found a strong support for the assertion that dividend change announcements convey information to the market that is superior to earnings announcements. Laub (1976) also agreed with Pettit's results by finding evidence of dividend announcement effect on share price. Studies by Aharony and Swary (1980),Woolridge (1983), Kane et al. (1984), Dielman and Oppenheimer (1984), Dhillon and Johnson (1994), Bernheim and Wantz (1995), Lipson et al. (1998), Ryan et al. (2000) also support signalling effect. Lang et al. (1989) and Yoon and Starks (1995) find reverse effect of dividend signalling on the share price.

Empirical studies for various markets in developed economies such as Easton (1991) for Australia, Abeyratna et al. (1996) and Gunasekarage and Power (2002) for UK, Conroy et al. (2000) for Japan, Travios et al. (2001) for Cyprus also found support to the signalling theory. Studies on various developing and emerging markets point out to mixed results. Chang and Chen (1991) and Chen et al. (2002) for China, Adelegan (2003) for Nigeria, Hossain et al. (2006) for Bangladesh, Pathirawasam (2009) for Sri Lanka, Irum et al. (2012) and Saleem et al. (2013) for Pakistan are supportive of the signalling theory. While studies by Abdullah and Rashid (2004) for Malaysian, Uddin and Chaudhary (2005) and Rahman et al. (2012) for Bangladesh, Akbar and Baig (2010) for Pakistan, Cooray and Wickremasinghe (2007) for India, Pakistan, Sri Lanka and Bangladesh on the other hand do not support signalling effect of dividend related

events. The studies on emerging markets particularly Sharma (2011) and Malhotra et al. (2012), predominantly are indicative of semi- strong characteristics of Indian stock market and the resulting effect of price adjustment with a time lag. Simultaneously, Bhatia (2010), Kumar and Mahadevan (2012) provide inconclusive inferences about the signalling effect of dividend announcement in the Indian stock market. Thus, literature in case of various stock markets in developed countries primarily support the signalling theory of dividend change announcement while for developing and other transient emerging markets in Asia suggest mixed results primarily due to weak- form of market efficiency (Cooray and Wickremasinghe (2007)).

This paper examines the Indian Stock Market which has gradually assumed prominence in the world with the inclusion of two Indian stock exchanges namely NSE and BSE with ranks of number one and eight in the list of top ten exchanges of the world in terms of number of trades (World Federation of Exchanges, 2013). India is also positioned number three amongst most emerging economies of the world in terms of financial market development (World Forum- Global Competitiveness Report 2011-12). As Indian Stock Market has matured over the years, it is examined whether signalling effect persists and if stock prices incorporate all available information instantaneously or exhibit inefficiencies by allowing more informed users to achieve abnormal returns.

Section 2 of the paper outlines the objectives followed by hypothesis in section 3. Methodology appear in section 4 of the paper detailing the sample as well as events selection and methodology adopted for the study particularly the GARCH (p, q) model in view of its ability to take care of heteroskedasticity in time series data (Jong, (1992)). Detailed analysis of results of dividend increase/decrease along with declaration of financial results has been carried out to test the hypotheses in section 5 along with discussions followed by conclusions in section 6.

2. Objectives

On view of discussion above, this paper has following research objectives.

i) To ascertain if there is any signalling effect of dividend decision on share prices of companies in the Indian Stock Market.

ii) To analyse if there are any abnormal returns associated with event 'increase or decrease in dividend along with declaration of financial results' and the period of their pronounced trend if any suggestive of market inefficiencies.

3. Hypotheses

Majority of the Indian companies announce dividend along with financial results and it is very difficult to separate the impact of dividend related event with other announcements. We examine the effect of dividend change (increase/decrease) announcement made along with financial results and its impact on share prices of the Indian listed companies. We propose following hypothesis for testing:

H_0 1: The dividend increase/decrease announcement made along with declaration of financial results is not associated with subsequent change in share price.

H_0 2: The increase/decrease in dividend announcement along with declaration of financial results is not associated with abnormal returns.

4. Methodology

It is prerequisite to draw a sample of companies which are representative of the stock market in terms of large market capitalization, high liquidity in terms of tradability, low volatility in terms of low mark to market margin. More than 20 Stock Exchanges are functioning in India at regional and national level. However , only two i.e. National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) stock exchanges are representative of Indian Stock Market (Taneem and Yuce (2011)). Our sample frame is comprised of prominent companies represented in both BSE- Sensex and NSE- CNX NIFTY Indices. The event announcement is taken from CMIE Prowess 4.1 database. Twenty companies common to both the indices, which announced regular dividend in the period financial years 2001 to 2011, have been selected for the study. These twenty companies represent 47% of market capitalisation among all the A-group listed companies (http://www.bseindia.com (Oct-2014)). Total events announced by the twenty sampled companies during the 10 –year period from April 1, 2001 to March 31, 2011 have been captured to be three hundred seventy nine. Taking an event window of 61 days (-30 days to +30 days), considering that events do not overlap with each other and there is a minimum 10% change from previous rate of announcement, only 124 dividends related events announcements were found relevant for the said period. A minimum 10% change in dividend from previous rate has been taken in view of its noticeability by investors as the rate is at par with maximum fixed deposit rates offered by Indian Banks. Appendix A shows twenty BSE/NSE listed companies and their dividend related events during April 1st, 2001 to March 31st 2011. Ninety one out of total 124 events constituting 73% of the dividend related events pertain to event 'dividend increase or decrease along with annual financial results announcement'.

To examine the impact of dividend related events on share price, abnormal returns have been calculated using GARCH (p, q) model as given by Bollerslev (1987). The application of GARCH (p, q) model for the estimation of abnormal return over simple OLS model is based on resolution of concerns regarding autocorrelation and heteroskedasticity in residuals as advocated by Serra (May 2002) and Pynnonen (2005). The daily returns of individual scripts and of the market accordingly have been calculated using closing BSE share prices for each of the 20 companies and closing BSE's index for the BSE's index return respectively.

The abnormal return of security in time period t can be calculated with the help of formula given below:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \qquad (1)$$

where $E(R_{i,t})$ corresponds to expected return of security i in time period t is calculated by using GARCH (p, q) model

is given by

$$E(R_{i,t}) = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \qquad (2)$$

subject to condition of error term $\varepsilon_{i,t} \approx N(0, \sigma_{i,t}^2)$ where variance in the error term is given by

$$\sigma_{i,t}^2 = \gamma_{i,0} + \gamma_1 \varepsilon_{i,t-1}^2 + ... + \gamma_p \varepsilon_{i,t-p}^2 + \theta_{i,1}\sigma_{i,t-1}^2 + ... + \theta_{i,p}\sigma_{i,t-p}^2 \qquad (3)$$

Equation (2) is simple ordinary least squares (OLS) model which puts the condition for mean of error term as zero and constant variance. Equation (3) includes volatility measured by the term error square lagged and lags of volatility itself to calculate variance of error.

The cumulative average abnormal return (CAAR) over the window period for n number of events being considered is given by

$$CAAR = \sum_t AAR_t \qquad (4)$$

where $AAR_t = \dfrac{1}{n}\sum_{i=1}^{n} AR_{i,t}$

The hypothesis testing has been carried out using t-test as favoured by Serra A. P. (2002) to determine whether abnormal return realized during event window is significant or is a chance happening. As a counter verifying tool to support the results of the parametric GARCH (p, q) model, a non -parametric RUN test has been applied to AAR as well as CARR to ascertain random behaviour. The descriptive statistics of daily returns appear in Appendix B. Stationarity using Augmented Dickey Fuller test statistics popularly known as Unit Root test, Goodness of Fit through Durbin Watson stats, AIC & BIC Values, Breusch-Godfrey Serial Correlation LM Test and Heteroskedasticity: ARCH Tests (Appendix- C) are performed to meet the requirements of GARCH (p, q) model.

5. Analysis of results and discussion

The trends associated in daily AAR and CAAR for respective events over the event window of 61 days have been analysed to draw inferences about the signalling effect of the event on share price movement as well as the relative efficiency of the stock market in response to price reaction with summaries appearing in Tables A-1.

Table A-1. Test of hypotheses at 5 % significance level

S. No.		Event day statistics	
	Hypothesis	ARR[a]	p-stat.[a]
H_0: 1.1	The dividend increase made along with declaration of financial results announcement is not associated with subsequent change in share price.	0.0646	0.07928
H_0: 1.2	The dividend decrease made along with declaration of financial results announcement is not associated with subsequent change in share price.	-0.0047	0.90291

[a] Calculated values based on Prowess 4.1 database

The average abnormal return on the event day is observed to be +6.46% and -0.47% for dividend increase/ decrease made along with announcement of financial results respectively. Though insignificant at 5% level of significance, the trend in abnormal returns on event day indicates reaction of the investors in the direction of dividend change. Higher average abnormal return for dividend increase event may be attributed to confidence of the investors in the market of the emerging Indian economy which at the same time does not penalise companies heavily for decrease in dividend in anticipation of better performance in future.

Figures 1a and1b in Panel A depict daily AAR and CAAR values plotted for the event window of sixty one days covering -/+ (pre-event/post-event) 30 days for the events 'dividend increase/ decrease announcement along with financial results announcement' based on the data appearing in Appendices D-1 and D-2 respectively. Panel A also shows Figures 2a and 2b depicting 10 - day mean CAAR bar graphs for respective corresponding events based on Appendix E.

Panel A: Daily AAR & CAAR values and 10 -day mean values of CAAR for the event window of sixty one days for the events dividend increase/decrease announcement along with financial results

Figure 1a : AAR & CAAR for event dividend increase along with financial results
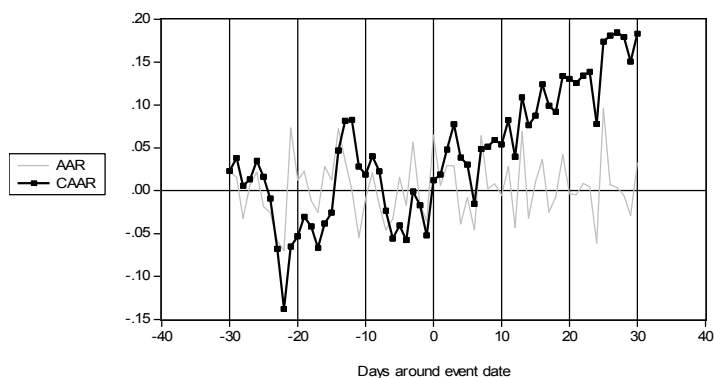
Figure 2a: Ten days mean value of CAAR for dividend increase along with financial results
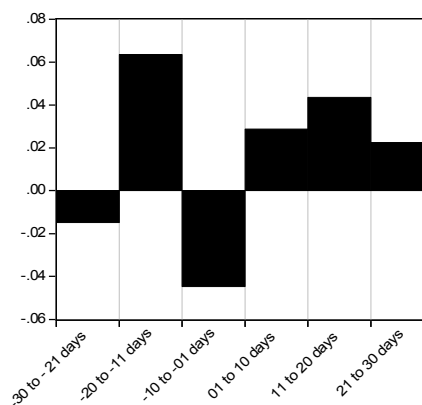
Figure 1b: AAR & CAAR for event dividend decrease alon with financial results
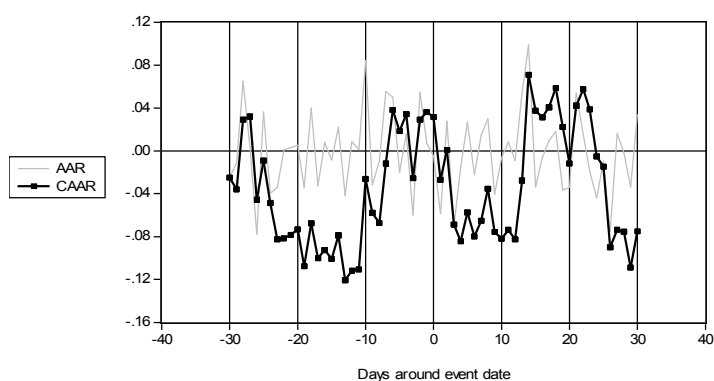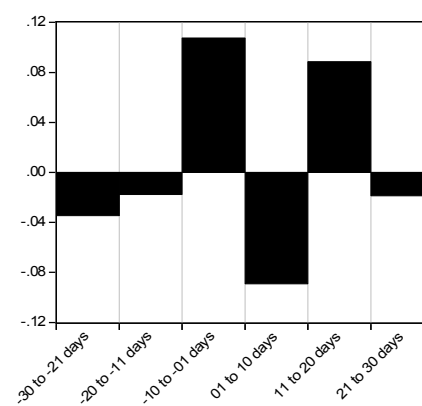
figure 2b: Ten days mean value of CAAR for event dividend decrease along with financial results

a Calculated values based on Prowess 4.1 database

The rest of the analysis is to examine the efficiency of the Indian stock market. Analysis of daily movements in AAR and CAAR to capture relative pronounced movements in abnormal returns provides interesting insights. Table A-2 shows the summary of pronounced periods of significant values of CAAR extracted from Appendices D-1 and D-2.

Table No. A-2. Summary of the pronounced periods of significant CAAR values at 5% level of significance during sixty- one day event period.

Event	Period of Positive CAAR values[a]			Pronounced period of significant CAAR[a] values		
	Pre event Period	Event day	Post event Period	Pre event Period	Event day	Post event period
Dividend increase with financial results announcement	-30 to -25, -14 to -08	00	+01 to+ 05, +07 to +30	No	No	+25 to+ 30
Dividend decrease with financial results announcement	-28 to -27, -02 to -01	00	+14 to +19, +21 to +23	-13 to -11	No	No

a Observed period of calculated values based on Prowess 4.1 database

Only events 'dividend increase/decrease along with financial results announcement' have been included in the study. It has been ensured that there are no other major noticeable announcements by companies during the event window of the study in the period covered by the study. Therefore, the trends in CAAR as shown in figure 1a and 1b respectively point out to the abnormal returns associated with the selected events only.

The observed trends in CAAR in the pre event period have tendency to return towards zero abnormal return for both the events reflecting motivated behaviour to earn abnormal return from the market due to asymmetric information. The post event trend in CAAR is quite different for both the events. In case of dividend increase along with financial results, a secular increasing trend is observed which can be interpreted as adjustment in post - event period prices.

The trend in CAAR in post- event period for the dividend decrease along with financial results event is quite different from the event dividend increase along with financial results. CAAR values for this event reflects a cyclical trend. The initial period shows a decreasing trend, followed by increasing and then gradually turning positive and eventually decreasing to show negative CAAR. The cyclical behaviour of CAAR can be attributed to initial panic reaction due to decrease in dividend announcement made along with financial results. The subsequent time lag in adjustment of prices in post- event period also points out to market inefficiencies. The ten days mean CAAR during pre-event period is volatile in nature and indicative of speculative activities during pre-event period for both the events. The post event period reflects positive/negative investor sentiments for increase or decrease in dividend respectively. The adjustment in CAAR values only after a time lag is indicative of market inefficiency.

Table No. A-3. Results of Run test for AAR and CAAR for the event window of sixty one days for the events dividend increase/decrease announcement along with financial results.

Event	Run Test for ARR[a]		Run Test for CAAR[a]	
	Div. increase announcement along with financial results disclosure	Div. decrease announcement along with financial results disclosure	Div. increase announcement along with financial results disclosure	Div. decrease announcement along with financial results disclosure
Tabled range with 5% significance level.	[38.997, 4.922]	[39.097, 4.987]	[10.3102,15.0388]	[10.3102,11.3764]
Calculated Run values	30	38	7	13

[a] Observed period of calculated values based on Prowess 4.1 database

Table A-3 shows the results of the Run test for AAR and CAAR for the event window of sixty one days for the two studied events. The calculated values of Run for AARs are lying between upper and lower limits indicating that AAR values are randomly distributed. The calculated values of Run test of CAAR values for both the events are outside the range of tabled probability values meaning that the CAAR values are not randomly distributed.

6. Conclusions

Our approach through the use of aggregated data on event dividend increase/decrease along with financial results announcement over ten year period does not support any significant impact of dividend increase/decrease along with financial results disclosure on the share price of listed companies in India. In addition, the abnormal returns before the event and time lag in adjustment of prices post-event point out to the inefficiencies in Indian Stock market. The results arrived by us are consistent with Uddin and Chaudhary (2005) on South Asian Emerging Markets and Indian Capital Market respectively. Our results are inconsistent with Chang and Chen (1991) and Chen et al. (2002) work on Chinese Market, one of the leading emerging economies of the world. From the managerial point of view, the result suggests that 'dividend rate change decision along with declaration of financial results' alone does not affect the share price movement due to information asymmetry between promoter groups and others in the absence of stringent and timely disclosure norms. In addition, information on proposed dividend rates be made public by the companies to avoid any tendency of abnormal returns in the market as part of corporate governance practice for transparency to enhance market efficiency. The regulatory authorities such as SEBI and respective stock exchanges need to enforce more stringent corporate governance practices by listed companies through insistence on immediate disclosure of all unpublished sensitive information to improve efficiency of the market. In this respect discussion paper on review of clause 36 and related clauses of Equity Listing Agreement by regulator SEBI (2014) requiring adequate disclosure of all material price sensitive information within a day and intimation of board decisions within fifteen minutes of the conclusion of the meeting to the concerned stock exchanges as well as punitive actions to ensure compliance is in sync with our recommendations for improving fairness and efficiency in the Indian Stock Market.

This research has opened up new dimensions for further investigation such as nature of mid and small cap segment of the stock market given the evidence from this study of twenty BSE indexed companies. Further, correlating ownership structures with abnormal returns can help explain to what extent ownership structure influences governance issues relating to transparency and disclosures in emerging markets.

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Appendix A**:** BSE/NSE listed companies and their dividend related events included in the   study for the period April 1st, 2001 to March 31st 2011.

S. No.	Name of Company	Dini[a]	Domm[b]	Dinc[c]	Ddec[d]	Dincfr[e]	Ddecfr[f]	Total Events
1	BHEL	-	-	-	-	3	-	3
2	Cipla	-	-	-	-	4	1	5
3	GAIL (India) Ltd.	-	-	2	2	3	2	9
4	Hero Motocorp	-	-	1	-	5	1	7
5	Hindalco Industries Ltd.	1	1	-	-	3	1	6
6	Hindustan Unilever Ltd.	-	-	-	1	5	3	9
7	ICICI Bank Ltd.	1	-	-	-	3	-	4
8	ITC. Ltd.	-	-	-	-	4	1	5
9	Infosys Ltd.	-	-	-	1	6	2	9
10	Jindal Steel & Power Ltd.	2	2	-	-	1	2	7
11	Larsen & Toubro Ltd.	-	-	-	-	4	2	6
12	Mahindra & Mahindra Ltd.	-	-	-	-	2	2	4
13	Oil & Natural Gas Ltd.	-	-	4	-	2	5	11
14	Reliance Industries Ltd.	1	1	-	-	2	1	5
15	State Bank of India	-	-	1	1	6	2	10
16	Sterlite Industries India Ltd.	1	1	-	-	1	-	3
17	Sun Pharmaceutical Industries Ltd.	3	2	1	-	3	-	9
18	Tata Motors Ltd.	1	-	-	-	3	-	4
19	Tata Power Co Ltd.	-	1	-	-	3	-	4
20	Tata Steel Ltd.	1	-	-	-	2	1	4
	Total Events	11	8	9	5	65	26	124

Notes: Events have been captured from Prowess 4.1 CMIE database

a Dividend initiation announcement, **b** Dividend Omission announcement, **c** Dividend change increase announcement, **d** Dividend change decrease announcement, **e** Dividend change increase announcement along with financial results, **f** Dividend decrease announcement along with financial results.

Appendix B: Descriptive Statistics of the sampled companies and Sensex based on 2496 observations for period
April 2001 to March 2011

S.No	BHEL	Mean	Std. Dev.[a]	Skew[b]	Kurt[c]	Jarque-Bera	Prob.[d]
1	Cipla	0.0015	0.0277	-2.0224	48.0684	212942.8	0.000
2	GAIL (India) Ltd.	0.0005	0.0240	-6.5016	168.309	2859601	0.000
3	Hero Motocorp	0.0012	0.0266	-0.441	30.0103	75894.40	0.000
4	Hindalco Industries Ltd.	0.0012	0.0238	0.6385	7.12183	1936.504	0.000
5	Hindustan Unilever Ltd.	0.0008	0.0275	-0.0491	7.33817	1958.256	0.000
6	ICICI Bank Ltd.	0.0003	0.0197	0.0684	6.16789	1045.642	0.000
7	ITC. Ltd.	0.0012	0.0295	0.2523	7.78986	2412.523	0.000
8	Infosys Ltd.	0.0006	0.0230	-4.8357	107.153	1137904.	0.000
9	Jindal Steel & Power Ltd.	0.0006	0.0310	-7.4811	167.536	2838780.	0.000
10	Larsen & Toubro Ltd.	0.0024	0.0374	-4.0122	104.132	1070391.	0.000
11	Mahindra & Mahindra Ltd.	0.0013	0.0301	-2.334	85.1149	703524.5	0.000
12	Oil & Natural Gas Ltd.	0.0014	0.0290	-1.7244	40.7845	149714.8	0.000
13	Reliance Industries Ltd.	0.0010	0.0272	-3.1226	70.6611	480171.9	0.000
14	State Bank of India	0.0008	0.0263	-3.2254	68.2698	447384.1	0.000
15	Sterlite Industries India Ltd.	0.0014	0.0246	0.1175	7.37069	1992.454	0.000
16	Sun Pharmaceutical Industries Ltd.	0.0016	0.0466	-1.2343	185.292	3455236.	0.000
17	Tata Motors Ltd.	0.0012	0.0233	-3.3418	76.1866	561699.3	0.000
18	Tata Power Co Ltd.	0.0016	0.0287	0.1351	6.41284	1218.937	0.000
19	Tata Steel Ltd.	0.0018	0.0263	0.1481	10.1460	5320.000	0.000
20	Total Events	0.0016	0.0308	-0.7354	13.1635	10967.95	0.000
	Sensex	0.0008	0.0166	0.1168	11.3158	7197.649	0.000

Calculated values based on Prowess 4.1 database using EViewssoftware.

[a] Standard Deviation, [b] Skewness, [c] Kurtosis, [d] Probability

Appendix C: Test Statistics

S. No.[a]	Unit Root Test		Goodness of Fit			B-G: LM Test[b]		Hetero: ARCH Test[c]	
	ADF t- stat.	Prob.	D -W Stat[d]	AIC	BIC	F-stat.	P-value	F-stat.	P-value
1	-37.179	0.000	1.960	-4.80	-4.80	0.98	0.32	0.065	0.799
2	-47.989	0.000	1.950	-4.79	-4.79	1.48	0.23	0.007	0.932
3	-40.573	0.000	1.599	-4.180	-4.18	2.34	0.13	0.169	0.681
4	-32.871	0.000	1.929	-4.907	-4.89	3.16	0.08	0.011	0.918
5	-45.466	0.000	1.930	-4.97	-4.96	1.98	0.16	0.013	0.909
6	-48.949	0.000	1.939	-5.39	-5.38	2.42	0.12	0.175	0.676
7	-45.337	0.000	1.936	-5.06	-5.05	2.56	0.11	1.345	0.246
8	-51.518	0.000	2.035	-4.96	-4.96	0.77	0.38	0.004	0.950
9	-49.591	0.000	1.956	-4.38	-4.38	1.22	0.27	0.024	0.877
10	-46.250	0.000	1.923	-4.07	-4.06	3.73	0.05	0.140	0.709
11	-47.052	0.000	2.012	-4.56	-4.56	0.10	0.76	0.001	0.972
12	-44.615	0.000	1.926	-4.69	-4.61	3.36	0.07	0.088	0.766
13	-46.795	0.000	1.879	-4.71	-4.69	8.58	0.00	0.017	0.895
14	-48.433	0.000	2.039	-5.20	-5.19	0.94	0.33	0.032	0.857
15	-47.056	0.000	1.956	-5.38	-5.36	1.08	0.30	0.431	0.512
16	-40.514	0.000	1.897	-3.43	-3.42	8.36	0.00	0.004	0.950
17	-51.221	0.000	2.036	-4.77	-4.76	1.10	0.29	0.406	0.524
18	-46.084	0.000	1.975	-4.98	-4.96	0.38	0.54	0.000	0.992
19	-37.233	0.000	2.026	-5.14	-5.12	8.80	0.00	1.992	0.158
20	-47.221	0.000	1.935	-4.77	-4.77	2.65	0.10	0.403	0.526
Sensex	-46.279	0.000							

Calculated values based on Prowess 4.1 database using EViewssoftware

[a,] S.No.of companies as in Appendix A, [b] Breusch-Godfrey Serial Correlation LM Test, [c] Heteroskedasticity: ARCH Test,

[d] Durbin-Watson Statistics,

Appendix D-1: AAR, CAAR and corresponding p- values associated with event dividend   increase decisions along with financial results announcement.

Days	AAR	CAAR	p-stat (AAR)	p-stat (CAAR)	Days	AAR	CAAR	p-stat (AAR)	p-stat (CAAR)
-30	0.02	0.023	0.527	0.758	+1	0.01	0.019	0.860	0.802
-29	0.01	0.038	0.675	0.609	+2	0.03	0.048	0.420	0.521
-28	-0.03	0.006	0.375	0.936	+3	0.03	0.077	0.424	0.304
-27	0.01	0.013	0.844	0.860	+4	-0.04	0.039	0.288	0.608
-26	0.02	0.034	0.551	0.642	+5	-0.01	0.030	0.825	0.685
-25	-0.01	0.016	0.611	0.827	+6	-0.05	-0.015	0.212	0.839
-24	-0.03	-0.009	0.485	0.903	+7	0.06	0.049	0.082	0.515
-23	-0.06	-0.067	0.110	0.367	+8	0.00	0.051	0.947	0.494
-22	-0.07	-0.138	0.057	0.069	+9	0.01	0.059	0.826	0.430
-21	0.07	-0.065	0.049*	0.386	+10	-0.01	0.054	0.885	0.472
-20	0.01	-0.053	0.738	0.481	+11	0.03	0.082	0.438	0.274
-19	0.02	-0.030	0.533	0.687	+12	-0.04	0.040	0.244	0.596
-18	-0.01	-0.042	0.756	0.580	+13	0.07	0.109	0.061	0.150
-17	-0.02	-0.067	0.493	0.376	+14	-0.03	0.077	0.381	0.308
-16	0.03	-0.038	0.438	0.610	+15	0.01	0.088	0.763	0.244
-15	0.01	-0.026	0.725	0.734	+16	0.04	0.124	0.318	0.101
-14	0.07	0.047	0.050	0.533	+17	-0.02	0.099	0.498	0.188
-13	0.03	0.082	0.339	0.278	+18	-0.01	0.092	0.838	0.222
-12	0.00	0.083	0.979	0.273	+19	0.04	0.134	0.251	0.222
-11	-0.05	0.028	0.139	0.706	+20	0.00	0.131	0.924	0.085
-10	-0.01	0.019	0.802	0.798	+21	0.00	0.126	0.896	0.097
-9	0.02	0.040	0.566	0.593	+22	0.01	0.134	0.814	0.077
-8	-0.02	0.023	0.634	0.761	+23	0.00	0.139	0.899	0.067
-7	-0.05	-0.023	0.209	0.757	+24	-0.06	0.078	0.098	0.300
-6	-0.03	-0.056	0.371	0.457	+25	0.10	0.174	0.010*	0.023*
-5	0.012	-0.040	0.672	0.590	+26	0.01	0.181	0.852	0.018*
-4	-0.02	-0.058	0.636	0.443	+27	0.00	0.185	0.917	0.016*
-3	0.06	-0.001	0.122	0.992	+28	-0.01	0.180	0.887	0.019*
-2	-0.02	-0.017	0.654	0.819	+29	-0.03	0.151	0.430	0.048*
-1	-0.04	-0.052	0.335	0.486	+30	0.03	0.183	0.374	0.017*
0	**0.06**	**0.012**	**0.080**	**0.869**					

Calculated values based on Prowess 4.1 database using EViewssoftware

*AAR and CAAR are significant at 5% level of significance.

Appendix D-2: AAR, CAAR and corresponding p- values associated with event dividend decrease decisions

along with financial results announcement.

Days	AAR	CAAR	p-stat (AAR)	p-stat (CAAR)	Days	AAR	CAAR	p-stat (AAR)	p-stat (CAAR)
-30	-0.03	-0.025	0.629	0.645	+1	-0.06	-0.027	0.128	0.622
-29	-0.01	-0.036	0.774	0.508	+2	0.03	0.001	0.470	0.988
-28	0.07	0.029	0.092	0.593	+3	-0.07	-0.069	0.071	0.207
-27	0.00	0.032	0.937	0.555	+4	-0.02	-0.084	0.688	0.124
-26	-0.08	-0.046	0.045*	0.402	+5	0.03	-0.058	0.483	0.292
-25	0.04	-0.009	0.340	0.866	+6	-0.02	-0.080	0.559	0.145
-24	-0.04	-0.049	0.302	0.371	+7	0.01	-0.065	0.704	0.232
-23	-0.03	-0.083	0.375	0.132	+8	0.03	-0.035	0.432	0.517
-22	0.00	-0.082	0.975	0.137	+9	-0.04	-0.076	0.292	0.167
-21	0.00	-0.079	0.938	0.152	+10	-0.01	-0.082	0.866	0.134
-20	0.01	-0.073	0.890	0.181	+11	0.01	-0.074	0.827	0.178
-19	-0.03	-0.108	0.369	0.051	+12	-0.01	-0.083	0.815	0.132
-18	0.04	-0.068	0.296	0.216	+13	0.05	-0.028	0.154	0.609
-17	-0.03	-0.100	0.393	0.069	+14	0.10	0.071	0.012*	0.193
-16	0.01	-0.092	0.839	0.092	+15	-0.03	0.038	0.379	0.490
-15	-0.01	-0.101	0.826	0.067	+16	-0.01	0.031	0.867	0.566
-14	0.02	-0.079	0.562	0.151	+17	0.01	0.041	0.803	0.455
-13	-0.04	-0.121	0.275	0.030*	+18	0.02	0.059	0.636	0.281
-12	0.01	-0.112	0.819	0.043*	+19	-0.04	0.022	0.340	0.682
-11	0.00	-0.111	0.975	0.045*	+20	-0.03	-0.012	0.375	0.829
-10	0.08	-0.026	0.030*	0.629	+21	0.05	0.042	0.160	0.437
-9	-0.03	-0.058	0.407	0.288	+22	0.02	0.058	0.686	0.290
-8	-0.01	-0.067	0.804	0.217	+23	-0.02	0.039	0.622	0.475
-7	0.06	-0.012	0.149	0.827	+24	-0.04	-0.005	0.252	0.926
-6	0.05	0.038	0.192	0.482	+25	-0.01	-0.015	0.798	0.785
-5	-0.02	0.019	0.604	0.734	+26	-0.08	-0.090	0.052	0.101
-4	0.02	0.034	0.680	0.529	+27	0.02	-0.074	0.668	0.178
-3	-0.06	-0.026	0.121	0.638	+28	0.00	-0.076	0.960	0.168
-2	0.05	0.029	0.154	0.591	+29	-0.03	-0.109	0.383	0.049*
-1	0.01	0.036	0.851	0.503	+30	0.03	-0.075	0.377	0.170
0	**0.00**	**0.032**	**0.903**	**0.559**					

Calculated values based on Prowess 4.1 database using EViewssoftware

*AAR and CAAR are significant at 5% level of significance.

Appendix E: 10- days mean CAAR[a], variance and standard deviation pre and post- event period during event window

of 61 days

Event		Pre event period			Post event period		
		-30 to -21	-20 to -11	-10 to -01	+01 to +10	+11 to +20	+21 to +30
Dividend increase along with financial results	Mean	-0.0148	0.0635	-0.0448	0.0288	0.0435	0.0225
	Var.	0.0033	0.0032	0.0013	0.0006	0.0008	0.0012
	SD	0.0572	0.0562	0.0356	0.0254	0.0286	0.0346
Dividend decrease along with financial results	Mean	-0.0346	-0.0179	0.1074	-0.0892	0.0886	-0.0187
	Var.	0.0018	0.0003	0.0016	0.0008	0.0029	0.0038
	SD	0.0422	0.0179	0.04	0.0282	0.0535	0.0618

[a] Calculated values based on Prowess 4.1 database using E-Views software.