Market Efficiency: National Elections and Stock Market

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Abstract

The paper aims to explore the Karachi stock exchange volatility during national elections for the sample period of 1997 to 2013. Four national elections were held during the sampled period. The stock return's average abnormal return (AABR) and cumulative average abnormal return (CAABR) are computed for a time window of 41 days that is 20 days prior, Election Day, and 20 days after the election. The returns of 120 days before the proposed time window are taken for the benchmark. The results indicate both positive and negative abnormal return in the proposed time frame for both AABR and CAABR by employing market model and market model adjusted for GARCH. Similarly, the cumulative average abnormal returns are tested for different time spam and results show abnormal return for all the national elections for stock market. The results indicate that Karachi stock exchange exhibit inefficient behavior around these national elections.

Keywords: Market efficiency, National elections, Average abnormal return, Cumulative average abnormal return, Market model, GARCH market model, Karachi stock exchange

Introduction

The importance of politics with respect to financial markets appears in regular interims into the spotlight of public concern. Unfortunately, the academic research has not been matched this fervent interest and the extensive literature advancing into the area has only commence to divulge the full dynamics political factors impose on security returns.

One of the central theory of finance and so far dominant as a paradigm, the Efficient Market Hypothesis (EMH) elucidates that asset prices at any given time, fully reflect all available information on an informationally efficient market (Fama, 1970). Under informational efficiency, news immediately absorb by the market and new relevant information solely driven that prices. Furthermore, specific information fix in the market, a market is assumed to be efficient, when it is not

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possible to realize economic profits (Jensen, 1978; Malkiel, 1992). Any asset true values are reflected by the prices based on available relevant information and thus no one can systematically earn abnormal profits in such market.

The empiricists have consistently challenged the EMH and long-run empirical regularities in returns have reported by a plenty of papers seeming that they contradict the notion of market efficiency. Within the paradigm of the EMH, they cannot be explicated, so anomalies have been referred to these phenomena. Indeed, over the last decades, one of the most enthrall and escalate fields of research in financial market is the study of security market anomalies (Singal, 2004). The calendar anomalies figure prominently like the turn-of-the-month effect (Ariel, 1987; Lakonishok & Smidt, 1988), the Monday effect (French, 1980; Jaffe, Westerfield, & Ma, 1989), and the January effect (Gultekin & Gultekin, 1983; Reinganum, 1983; Rozeff & Kinney, 1976) and the like. In order to explicate the puzzling perseverance of these and other patterns in spite of prevailing arbitrage opportunities, 'Behavioral Finance' (Shleifer, 2000) a growing research area, (Shefrin, 2002) examines how anomalies in the market prices and returns are created by emotional or cognitive biases that may be unable to explained by EMH alone.

The interdependence of economics and politics is adequately entrenched in the history of both fields and has developed such dominant theories as the partisan theory (Hibbs, 1977) or the political business cycles theory (Nordhaus, 1975). Santa-Clara and Valkanov (2003) and Booth and Booth (2003) articles have arouse the finance community and instigated vivid academic curiosity from a 'political' angle of the financial markets.

The present paper is driven to overcome numerous shortcomings in the existing empirical literature of finance by advancing and validating a number of theoretical predictions. At the moment, much work on the association among the financial markets and political variables lacks rigorous Pakistani investigation. Hence, the present paper focuses on market dynamics around general elections in Pakistan. As such, investors revise their expectations based on the outcome of these events as investors closely followed political events. During the periods of vote casting, the evidence of sharp price movements will lend support to the conjecture that participants in the market tend to surprise by the outcome of the actual election.

Based on the research questions and relevant literature, the objectives of the study are; to measure the Karachi stock market volatility during national assembly elections and to investigate the semi strong form of market efficiency for stock market volatility during national assembly elections.

Literature Review

One of the fundamental theories of finance is the market efficiency and is being considered the main theory of market reaction to news events. Fama (1970) report that the security prices set back to equilibrium quickly, when market respond to public news immediately. The Efficient Market Hypothesis (EMH) propose that all participants rationally behave and market friction is insignificant or negligible (Barberis & Thaler, 2003; Fama, 1970).

EMH semi-strong form proposes that both recent and historical information fully reflected in security prices. New publicly available information brings fluctuations in equilibrium but usually eradicated very quickly. Thus, in long-run by using this information, investors cannot achieve excess returns. Downe, O'Connor, Shapiro, and Reid (2004) report that semi-strong form supports, the market price is the best estimate of a share's fair value.Corrado (2001) favors Fama's idea that since all available information immediately fully revealed in security prices so financial information cannot be used to determine under or overpriced security. Event study is based on this form of EMH.

EMH got early recognition and dominated the academic area of finance till 1970, however, in 1970s and onward; anomalies in the market behavior were noticed by the numerous empirical studies. These anomalies are not based on the information available in the market, which look like to challenge the EMH.

Yau (2012) reported that losers in the past tend to be winners in the future and vice versa, argued that over emphasizing in the companies past performance results in long-term return reversal. Fundamental-related anomalies include Value Effect and Size Effect. Ball (1978) and Banz (1981) found that in contrast to larger firms, there is a higher risk adjusted returns for smaller firms.

One of the important tools event studies has been used to test and analyze anomalies, when there is a discussion over the levels of efficiency of the market. Event studies have been classified to test the semi-strong form of EMH by Fama in 1991. If there is a difference between the actual security returns and predicted results so the stock prices did affected by the event studied and did influence investor reaction to the event. The market can be considered to be inefficient, when these anomalies drift in the long-run (Wells, 2004).

Event Studies can be classified into self-selected events and non-self-selected groups. Dividend announcements, stock splits, share repurchases, new debt or equity offerings, earning announcements, and mergers and acquisitions are the examples of self-selected corporate events. Events outside the control of companies and exogenous, includes in non-self-selected events like terrorism or natural disasters, financial

crises, regulation or law changes. The event day time and affect would be the same for the all the companies (Lo & Mckinley, 2004).

In order to examine the effect of national elections on security market volatility (Bialkowski, Gottschalk, & Wisniewski, 2008) employed 27 OECD countries data and found that election effect the return and reflected by the country specific index component, indicates the surprise elections brings to investors.

Santa-Clara and Valkanov (2003) reported that during the Democratic, returns are higher in the stock market than the Republican presidencies. The paper further add that less real interest rates and more real returns on stock are the reasons for this difference and that are robust and statistically significant in subsample.

In order to investigate other countries security returns depend on incumbents' political orientation (Bialkowski, Gottschalk, & Wisniewski, 2007) conducted a study considering 24 security markets and 173 different governments. Results indicate that among the left and right wing executives, the returns are not statistically different. Therefore, political orientation of countries leadership is probably to be ineffective when investors allocating their investment internationally.

Abidin, Old, and Martin (2010) examined the effect of political cycle on security returns in New Zealand considering the Labor and National government, found that security returns are affected by the presence of the political cycle and results of the study are coherent with the many updated studies conducted in the Australia and New Zealand. Moreover, as throughout the terms in the office of the national party (New Zealand's right-of-center), the returns are significantly above the average than the labor party (left-of-center) counterparts.

The findings indicate that in the field of finance the argument is still an interesting and unsolved issue. The literature further provides many explanations on market efficiency, anomalies, event studies, and elections. But no research has drawn attention to the political event i.e. national election in particular and Stock market in the context of Pakistan. There is an increasing literature on the examinations of market efficiency and corporate events have been examined by researchers in Pakistan or global perspective. This enhances the motivation to investigate fluctuation of stock market during the national elections from the Pakistan perspective.

Data and Methodology

The research used secondary data to test the proposed hypothesis. The stock market data of KSE 100 index and share prices of the companies was collected from Karachi Stock Exchange, Business Recorder, www.finance.yahoo.com, www.thefinancialdaily.com and SC Securities

websites. Elections data was collected from the website of Election Commission of Pakistan.

Hypotheses

The study examines the following hypotheses; the null hypothesis below would imply the efficiency of Pakistani Stock market in semi-strong form.

H_{01}: There is no statistically significant average abnormal return (AABR) in the Karachi stock exchange around national elections.

H_{02}: The cumulative average abnormal returns (CAABR) for all the time windows in the Karachi stock exchange and general elections considered are statistically insignificant.

Population and Sampling Procedures

The population of the study consists of all listed companies on Karachi Stock Exchange, whereas, all the companies in KSE-100 index as a sample. As sampled companies varies during different elections, so the companies on one day prior the 2013 election is considered as the sample companies. Moreover, the KSE-100 index and companies share price data during the last four elections i.e. 1997, 2002, 2008, and 2013 of 140 days before, the Election Day, and 20 days after is consider. A convenient sampling technique was used due to the availability of data for the study. Moreover, event day is defined as day zero but in the current study case, national elections in Pakistan took place on the holiday or during the weekend. Hence, the study defined day zero as the last trading day before the general election.

Techniques/ Tools/ Approaches/ Instrumentation

The convention adopted in the literature for the type of event studies described by (Akbar & Baig, 2010) is to use the dividend announcements. The price of each stock (stock returns) and KSE-100 index (market returns) for 120 days 20 days prior to the Election Day is used to estimate the market model:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \mu_i \qquad (1)$$

where

$E(R_{it})$ = is the expected return on company *i* stock on any given day *t*,

α_i = is the constant term,

β_i = is the sensitivity of company *i* stock to market returns R_{mt}.

The actual returns on each stock are calculated for the market model and 41-day window using the following formula:

$$AR_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}} \quad (2)$$

where

AR_{it} = actual returns on company *i* stock on any given day *t,*

P_{it} = closing price of stock *i* on any given day *t*,

P_{it-1} = closing price of stock *i* the previous day *t-1*.

In the same manner, market returns are calculated using the following formula:

$$R_{mt} = \frac{KSE100_t - KSE100_{t-1}}{KSE100_{t-1}} \quad (3)$$

where

R_{mt} = market returns on any given day *t,*

$KSE100_t$ = the KSE 100 index value on any given day *t*,

$KSE100_{t-1}$ = the KSE 100 index value of the previous day *t-1*.

The study then calculated the returns for 20 days prior, the Election Day, and 20 days post-Election day for each stock using the market model. Then abnormal returns are calculated on each of the 41 days for each stock as:

$$ABR_{it} = AR_{it} - \hat{R}_{it} \quad (4)$$

Where ABR_{it} = abnormal returns on company *i* stock on day *t*. AR_{it} is the actual return on any given day *t* for *i* company. $\hat{R}_{it}$ is the estimated return on company *i* stock on given day *t* using market model. Average daily abnormal returns for each of the 41 days are calculated as:

$$AABR_t = \sum_{i}^{n} \frac{ABR_{it}}{n} \quad (5)$$

Where $AABR_t$ is the average abnormal return on a given day and *n* is the number of sample companies. Further cumulative average abnormal returns *(*$CAABR_t$*)* are calculated as:

$$CAABR_t = \sum_{t=ti}^{tj} AABR_t \quad (6)$$

ti and tj represent researchers' specified time windows to investigate the cumulative effect of national elections on stock returns. In addition to 20 days before and after the window, the study also used (-20, +20), (-10, +10), (-5, +5), (0, +5), (-1, +1) and (-1, 0) time windows. These time

windows were selected to evaluate how abnormal returns behave within any of these particular time windows before and after the Elections, enabling to identify any significant holding period over which abnormal returns might be significant.

To determine the statistical significance of the $AABR_t$ the study used a parametric test, i.e., the *t*-test. The *t*-test utilizes the cross-sectional standard deviation of abnormal returns *(ABR_t)* and is calculated as:

A simple test for testing H_0: AABR=0 is given by

$$t_{AABR_t} = \sqrt{N}\frac{AAR_t}{S_{AABR_t}} \quad (7)$$

Where S_{AABR_t} is the standard deviation across firms and stock at time t

$$S^2_{AABR_t} = \frac{1}{N-1}\sum_{i=1}^{N}(AR_{i,t} - AAR_t)^2 \quad (8)$$

Test statistics for testing H_0: CAABR=0 is given by

$$t_{CAABR} = \sqrt{N}\frac{CAABR}{S_{CAABR}} \quad (9)$$

where is the standard deviation of the cumulative abnormal returns across the sample

$$S^2_{CAABR} = \frac{1}{N-1}\sum_{i=1}^{N}(CAR_i - CAABR)^2 \quad (10)$$

Moreover, the study also used a nonparametric test, i.e., the Wilcoxon Signed Rank Test (WCSRT) to investigate the robustness of the results for $AABR_t$.When testing for positive above average performance and too rarely when analyzing for negative abnormal performance, parametric tests rejects too often. Parametric test are not well specified, when the assumption of normality of excess returns is violated. This test considers that abnormal returns sign and magnitude both are important. The statistical representation is as:

$$W = \sum_{i=1}^{N} r_i^+ \quad (11)$$

Where r_i^+ is the positive rank of the absolute value of excess returns. The test supposes that each of the absolute value is different from zero and absolute values are unequal. With a larger N, the distribution of S_N, under the null hypothesis of equally likely negative or positive excess returns, will be approximately a normal distribution with:

$$E(W) = \frac{N(N+1)}{4}$$
$$\sigma^2(W) = \frac{N(N+1)(2N+1)}{24} \quad (12)$$

Using OLS method, the market models parameters are most likely estimated, are then employing to calculate excess returns linked with the event examined. Certain assumptions are considered to have efficient parameters estimates and consistent test statistics. The assumptions include constant coefficients of market model and homoscedasticity in residuals. The exclusion of time dependence in security return series will lead to inconsistent test statistics and inefficient parameter estimates(Akgiray, 1989) for the US market and (Corhay & Rad, 1994) for European markets. Therefore, Bollerslev (1986, 1987) developed Generalized Autoregressive Conditional Heteroskedatic (GARCH) models, which describe the empirical characteristics of return and residual series, allows for non-linear inter-temporal dependence. So, the convention adopted in the literature for the type of event studies using market model corrected for GARCH described by (Corhay & Rad, 1996) also considered for the study. The market model adjusted for GARCH model as below:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$
$$\varepsilon_{it} = R_{it} - \alpha_i - \beta_i R_{mt} \quad (2)$$
$$\varepsilon_1 it \; |\psi_\downarrow (it-1) \sim D(0, h_1 it, d) \quad (3)$$
$$h_{it} = a_{i0} + \sum_{k=1}^{p} a_{ik}\, \varepsilon^2_{it-k} + \sum_{j=1}^{q} b_{ij}\, h_{it-j}$$

Where, on firm i through time t, ψ_{it} is the set of all information. For firm , h_{it} is the conditional variance, and with *d* degree of freedom, *D* is a student-*t* distribution, and $q \geq 0;\ b_{ij} \geq 0, \quad j = 0,\ldots,q;\ p \geq 0;\ aik \geq 0, i = 0,\ldots,p.$

Data Analysis

AABR and CAABR using MM and MMG of Stock Market for 1997 National Election

The AABR and CAABR of stock market for 1997 national election using Market Model (MM) and GARCH Market Model (MMG) for the considered time window of -20 days i.e. 20 days before and +20 days i.e. 20 days after the event day are reported in Table 1. The results indicate that AABR using MM model are statistically significant according to *t*-test for day-15 (-0.538%), day-13 (0.892%), day-3 (1.138%), day-1

(0.586%), day0 (-2.009%), day1 (4.319%), day2 (1.706%), day4 (-1.817%), day5 (4.658), day6 (1.852%), day9 (0.866%), day10 (-1.483%), day16 (-2.046%), and day17 (2.485%) with the associated t values in parenthesis. The t-value indicates that all these returns are significant at 5% significance level. Similarly, Wilcoxon Signed Ranked Test (WCSRT) shows that the MM AABR on day15 (-0.538%), day13 (0.892%), day12 (-0.380%), day8 (0.081%), day5 (-0.325%), day3 (1.138%), day2 (-0.393%) before the event, the event day (-2.009%), day1 (4.319%), day2 (1.706%), day4 (-1.817%), day5 (4.658), day9 (0.866%), day10 (-1.483%), day15 (-1.095%), day16 (-2.046%), and day17 (2.485%) after the event are significantly different from zero as evident from the respective t-values. As opposed, the adjusted version of Market Model for GARCH (MMG) for average abnormal returns reveals that four days before the event i.e. day -15, -13, -3, -1, day 0, and nine days after the event i.e. day +1, +2, +4, +5, +6, +9, +10, +16, and day +17 are statistically significant according to *t*-test. The non-parametric WCSRT reveals that the MMG AABR are statistically significant for day eight days before i.e. day 15,14, 13, 12,8, 5, 3, 2, the event day, and eleven days after the event i.e. day 1, 2, 3, 4, 5, 7, 9, 10, 15, 16, and 17 are statistically significant according to WCSRT *z*- test.

The CAABR based on MM model are statistically insignificant and cannot reject the null hypothesis at 5% level of significance from -20 day till day 0 and also on day +4 according to both *t*-test and WCSRT *z*-test. In addition, CAABR for MMG model using WCSRT *z*-test day -20 to day +1, and also day +4, and +16 are statistically insignificant. It reveals that CAABR for both MM and MMG have a significantly different from zero and thus generate higher returns after the event occurred.

Table 1: AABR and CAABR using MM and MMG of Stock Market (1997 National Election)

Days	AABR				CAABR			
	t-test		WCSRT (*z*-test)		*t*-test		WCSRT (*z*-test)	
	MM	MMG	MM	MMG	MM	MMG	MM	MMG
Day -20	0.00033	0.00004	0.00033	0.00004	0.00033	0.00004	0.00033	0.00004
Day -19	0.00161	0.00133	0.00161	0.00133	0.00194	0.00136	0.00194	0.00136
Day -18	0.00175	0.00126	0.00175	0.00126	0.00369	0.00263	0.00369	0.00263
Day -17	-0.00168	-0.00212	-0.00168	-0.00212	0.00200	0.00050	0.00200	0.00050
Day -16	-0.00206	-0.00240	-0.00206	-0.00240	-0.00005	-0.00190	-0.00005	-0.00190
Day -15	-0.00538	-0.00571	-0.00538	-0.00571	-0.00543	-0.00761	-0.00543	-0.00761
Day -14	0.00056	0.00017	0.00056	0.00017	-0.00487	-0.00744	-0.00487	-0.00744
Day -13	0.00892	0.00856	0.00892	0.00856	0.00405	0.00113	0.00405	0.00113

Day -12	-0.00380	-0.00424	-0.00380	-0.00424	0.00025	-0.00311	0.00025	-0.00311
Day -11	0.00270	0.00175	0.00270	0.00175	0.00295	-0.00136	0.00295	-0.00136
Day -10	-0.00076	-0.00143	-0.00076	-0.00143	0.00219	-0.00278	0.00219	-0.00278
Day -9	-0.00200	-0.00248	-0.00200	-0.00248	0.00019	-0.00526	0.00019	-0.00526
Day -8	0.00081	0.00042	0.00081	0.00042	0.00100	-0.00483	0.00100	-0.00483
Day -7	0.00400	0.00368	0.00400	0.00368	0.00500	-0.00115	0.00500	-0.00115
Day -6	0.00271	0.00231	0.00271	0.00231	0.00771	0.00116	0.00771	0.00116
Day -5	-0.00325	-0.00358	-0.00325	-0.00358	0.00447	-0.00242	0.00447	-0.00242
Day -4	-0.00010	-0.00068	-0.00010	-0.00068	0.00437	-0.00310	0.00437	-0.00310
Day -3	0.01138	0.01071	0.01138	0.01071	0.01574	0.00761	0.01574	0.00761
Day -2	-0.00393	-0.00433	-0.00393	-0.00433	0.01181	0.00328	0.01181	0.00328
Day -1	0.00586	0.00548	0.00586	0.00548	0.01767	0.00876	0.01767	0.00876
Day 0	-0.02009	-0.02061	-0.02009	-0.02061	-0.00242	-0.01185	-0.00242	-0.01185
Day +1	0.04319	0.04121	0.04319	0.04121	0.04077	0.02936	0.04077	0.02936
Day +2	0.01706	0.01527	0.01706	0.01527	0.05782	0.04464	0.05782	0.04464
Day +3	-0.00219	-0.00299	-0.00219	-0.00299	0.05563	0.04164	0.05563	0.04164
Day +4	-0.01817	-0.01867	-0.01817	-0.01867	0.03746	0.02297	0.03746	0.02297
Day +5	0.04658	0.04380	0.04658	0.04380	0.08404	0.06677	0.08404	0.06677
Day +6	0.01852	0.01742	0.01852	0.01742	0.10257	0.08419	0.10257	0.08419
Day +7	0.00061	-0.00039	0.00061	-0.00039	0.10318	0.08380	0.10318	0.08380
Day +8	0.00757	0.00699	0.00757	0.00699	0.11075	0.09079	0.11075	0.09079
Day +9	0.00866	0.00822	0.00866	0.00822	0.11940	0.09901	0.11940	0.09901
Day +10	-0.01483	-0.01540	-0.01483	-0.01540	0.10457	0.08361	0.10457	0.08361
Day +11	0.00411	0.00301	0.00411	0.00301	0.10868	0.08662	0.10868	0.08662
Day +12	0.00444	0.00331	0.00444	0.00331	0.11312	0.08993	0.11312	0.08993
Day +13	-0.00572	-0.00630	-0.00572	-0.00630	0.10739	0.08363	0.10739	0.08363
Day +14	-0.01196	-0.01307	-0.01196	-0.01307	0.09543	0.07057	0.09543	0.07057
Day +15	-0.01095	-0.01177	-0.01095	-0.01177	0.08448	0.05880	0.08448	0.05880
Day +16	-0.02046	-0.02129	-0.02046	-0.02129	0.06402	0.03751	0.06402	0.03751
Day +17	0.02485	0.02425	0.02485	0.02425	0.08887	0.06176	0.08887	0.06176
Day +18	-0.00253	-0.00306	-0.00253	-0.00306	0.08634	0.05870	0.08634	0.05870
Day +19	-0.00380	-0.00499	-0.00380	-0.00499	0.08254	0.05372	0.08254	0.05372
Day +20	-0.00242	-0.00300	-0.00242	-0.00300	0.08012	0.05071	0.08012	0.05071

Note: AABRs and CAABRs that are significant at 5% level of significance according to *t*-test and *z*-test are underlined.

CAABRs using MM and MMG for Various Intervals of Stock Market for 1997 National Election

For 1997 election the CAABR using MM and MMG with various time intervals are reported in Table 2.It shows that the MM CAABR for all the considered time windows in days i.e. (-20, +20) is 8.012%, (-10, +10) is 10.162%, (-5, +5) is 7.633%, (0, +5) is 6.638%, (-1, +1) is 2.895% and (-1, 0) is -1.423% are statistically significant as evident from both *t*-test and WCSRT *z*-test. Whereas, the CAABR using MMG for all the considered time windows i.e. (-20, +20), (-10, +10), (-5, +5), (0, +5), (-1, +1) and (-1, 0) are significantly different from zero by both *t*-test and WCSRT test except the time window (-20, +20) day, which is insignificant according to*t*-test in case of MMG.

Table 2: CAABRs using MM and MMG, t-test, and WCSRT for Various Intervals of Stock (1997 National Election)

Period		CAABR			
		t-test		WCSRT (*z*-test)	
		MM	MMG	MM	MMG
-20	+20	0.08012	0.05071	0.08012	0.05071
		(***3.4110***)	(1.7108)	(***3.118***)	(***2.243***)
-10	+10	0.10162	0.08497	0.10162	0.08497
		(***4.7080***)	(***3.3876***)	(***4.113***)	(***3.387***)
-5	+5	0.07633	0.06561	0.07633	0.06561
		(***4.5702***)	(***3.4845***)	(***3.954***)	(***3.367***)
0	+5	0.06638	0.05801	0.06638	0.05801
		(***4.6146***)	(***3.6731***)	(***4.113***)	(***3.477***)
-1	+1	0.02895	0.02608	0.02895	0.02608
		(***3.6831***)	(***3.1743***)	(***3.208***)	(***2.820***)
-1	0	-0.01423	-0.01513	-0.01423	-0.01513
		(***-2.6058***)	(***-2.8005***)	(***-2.979***)	(***-3.158***)

Note: *t*-values and *z*-values are in parentheses at 5% level of significance

AABR and CAABR using MM and MMG of Stock Market for 2002 National Election

The AABR and CAABR using MM and MMG of stock market for 2002 general election for the proposed time window are reported in Table 3. Using *t*-test and *z*-test, the significant MM AABR on day 2, 5, 6, 8, 11, 12, and 13 are -0.81, -2.13, 0.84, -0.77, 0.78, -0.55 and -0.47% respectively. In addition, day -6, +16, +19, and +20 are statistically significantly for only *z*-values. Similarly, the results of AABR using MMG model reveals a statistically significant AABR on day -5, +2, +5, +8, +11, +12, +13 and +19 according to *t*-values. However, MMG AABR *z*-values report that day 9 and day 6 before the event and eight day i.e. day2, 5, 8, 11, 12, 13, 19 and 20 after the event are statistically significant, rejecting the null hypothesis, indicating statistically significant abnormal returns around the national election.

The results of MM CAABR indicate that CAABR is statistically insignificant for the entire considered time window according to both *t*-values and WCSRT *z*-values except on day +5 (-2.80%) having a significant return only according to *z*-test. On the other hand, CAABR

using MMG is statistically significant and negative on day +5, +6, +8, +9 and +10 according to *t*-values. Likewise, MMG CAABR on day -19, +5, +6, +8, +9, +10, +12, +13, +14, +15,+16, +17, +18, +19 and +20 having return of -0.58,-6.19, -5.63,-6.43, -6.71, -6.82,-7.56, -8.77, -9.43, -9.80, -9.74, -9.93, -10.09,-10.77 and -11.15 percent respectively are statistically significant according to *z*-values.

Table 3: AABR and CAABR using MM and MMG of Stock Market (2002 National Election)

Days	AABR				CAABR			
	t-test		WCSRT (*z*-test)		*t*-test		WCSRT (*z*-test)	
	MM	MM G	MM	MM G	MM	MM G	MM	MM G
Day -20	-0.0019	-0.0020	-0.0019	-0.0020	-0.0019	-0.0020	-0.0019	-0.0020
Day -19	-0.0029	-0.0038	-0.0029	-0.0038	-0.0048	-0.0058	-0.0048	-0.0058
Day -18	0.0023	0.0017	0.0023	0.0017	-0.0025	-0.0041	-0.0025	-0.0041
Day -17	0.0013	0.0007	0.0013	0.0007	-0.0012	-0.0034	-0.0012	-0.0034
Day -16	-0.0023	-0.0030	-0.0023	-0.0030	-0.0036	-0.0064	-0.0036	-0.0064
Day -15	0.0011	0.0006	0.0011	0.0006	-0.0025	-0.0058	-0.0025	-0.0058
Day -14	0.0041	0.0034	0.0041	0.0034	0.0017	-0.0025	0.0017	-0.0025
Day -13	0.0019	0.0014	0.0019	0.0014	0.0036	-0.0011	0.0036	-0.0011
Day -12	0.0035	0.0031	0.0035	0.0031	0.0071	0.0020	0.0071	0.0020
Day -11	-0.0006	-0.0011	-0.0006	-0.0011	0.0065	0.0009	0.0065	0.0009
Day -10	-0.0024	-0.0034	-0.0024	-0.0034	0.0041	-0.0025	0.0041	-0.0025
Day -9	-0.0002	-0.0011	-0.0002	-0.0011	0.0039	-0.0037	0.0039	-0.0037
Day -8	0.0049	0.0040	0.0049	0.0040	0.0088	0.0003	0.0088	0.0003
Day -7	-0.0012	-0.0022	-0.0012	-0.0022	0.0076	-0.0019	0.0076	-0.0019
Day -6	-0.0032	-0.0043	-0.0032	-0.0043	0.0044	-0.0062	0.0044	-0.0062
Day -5	-0.0035	-0.0053	-0.0035	-0.0053	0.0009	-0.0115	0.0009	-0.0115
Day -4	-0.0019	-0.0069	-0.0019	-0.0069	-0.0011	-0.0184	-0.0011	-0.0184
Day -3	0.0012	-0.0018	0.0012	-0.0018	0.0002	-0.0201	0.0002	-0.0201
Day -2	0.0017	-0.0009	0.0017	-0.0009	0.0019	-0.0210	0.0019	-0.0210
Day -1	0.0000	-0.0022	0.0000	-0.0022	0.0019	-0.0232	0.0019	-0.0232
Day 0	-0.0018	-0.0034	-0.0018	-0.0034	0.0001	-0.0266	0.0001	-0.0266
Day +1	0.0014	-0.0001	0.0014	-0.0001	0.0016	-0.0267	0.0016	-0.0267
Day +2	-0.0081	-0.0092	-0.0081	-0.0092	-0.0065	-0.0359	-0.0065	-0.0359
Day +3	-0.0035	-0.0048	-0.0035	-0.0048	-0.0100	-0.0407	-0.0100	-0.0407
Day +4	0.0032	0.0017	0.0032	0.0017	-0.0068	-0.0390	-0.0068	-0.0390
Day +5	-0.0213	-0.0229	-0.0213	-0.0229	-0.0280	-0.0619	-0.0280	-0.0619
Day +6	0.0084	0.0056	0.0084	0.0056	-0.0197	-0.0563	-0.0197	-0.0563
Day +7	0.0039	0.0014	0.0039	0.0014	-0.0158	-0.0549	-0.0158	-0.0549
Day +8	-0.0077	-0.0094	-0.0077	-0.0094	-0.0235	-0.0643	-0.0235	-0.0643
Day +9	-0.0003	-0.0028	-0.0003	-0.0028	-0.0238	-0.0671	-0.0238	-0.0671
Day +10	0.0011	-0.0011	0.0011	-0.0011	-0.0227	-0.0682	-0.0227	-0.0682
Day +11	0.0078	0.0061	0.0078	0.0061	-0.0149	-0.0621	-0.0149	-0.0621
Day +12	-0.0055	-0.0135	-0.0055	-0.0135	-0.0204	-0.0756	-0.0204	-0.0756
Day +13	-0.0047	-0.0121	-0.0047	-0.0121	-0.0251	-0.0877	-0.0251	-0.0877
Day +14	-0.0008	-0.0066	-0.0008	-0.0066	-0.0260	-0.0943	-0.0260	-0.0943
Day +15	0.0001	-0.0038	0.0001	-0.0038	-0.0258	-0.0980	-0.0258	-0.0980
Day +16	0.0034	0.0007	0.0034	0.0007	-0.0224	-0.0974	-0.0224	-0.0974
Day +17	0.0002	-0.0019	0.0002	-0.0019	-0.0222	-0.0993	-0.0222	-0.0993
Day +18	0.0001	-0.0016	0.0001	-0.0016	-0.0221	-0.1009	-0.0221	-0.1009
Day +19	-0.0040	-0.0068	-0.0040	-0.0068	-0.0262	-0.1077	-0.0262	-0.1077
Day +20	-0.0020	-0.0038	-0.0020	-0.0038	-0.0282	-0.1115	-0.0282	-0.1115

Note: AABRs and CAABRs that are significant at 5% level of significance according to *t*-test and *z*-test are underlined.

CAABRs using MM and MMG for Various Intervals of Stock Market for 2002 Election

The MM and MMG CAABR for the six various time intervals for 2002 national election of stock market are reported in Table 4. The results

indicate that CAABR using MM for the time windows (-10, +10), (-5, +5) and (0, +5) have statistically significant returns of -2.92, -3.24 and -2.99% respectively according to both *t*-values and *z*-values. Similarly, the MMG CAABR are statistically insignificant for all considered time window according to *t*-values, while statistically significant for the four out of six time windows i.e. (-20, +20), (-10, +10), (-5, +5) and (0, +5) days according to *z*-values.

Table 4: CAABRs using MM and MMG, t-test, and WCSRT for Various Intervals of Stock (2002 Election)

Period		CAABR			
		t-test		WCSRT (z-test)	
		MM	MMG	MM	MMG
-20	+20	-0.02819	-0.11150	-0.02819	-0.11150
		(-1.6381)	(-0.6509)	(-1.741)	(***-2.579***)
-10	+10	-0.02922	-0.06910	-0.02922	-0.06910
		(***-2.2731***)	(-0.7907)	(***-2.438***)	(***-2.982***)
-5	+5	-0.03241	-0.05575	-0.03241	-0.05575
		(***-3.4501***)	(-1.1609)	(***-3.171***)	(***-3.397***)
0	+5	-0.02992	-0.03870	-0.02992	-0.03870
		(***-3.3106***)	(-1.5097)	(***-3.575***)	(***-3.746***)
-1	+1	-0.00035	-0.00563	-0.00035	-0.00563
		(-0.0634)	(-0.4098)	(0.263)	(0.037)
-1	0	-0.00179	-0.00557	-0.00179	-0.00557
		(-0.4396)	(-0.5902)	(-0.519)	(-0.758)

Note: *t*-values and *z*-values are in parentheses at 5% level of significance

AABR and CAABR using MM and MMG of Stock Market for 2008 National Election

The Market Model and GARCH Market Model returns i.e. AABR and CAABR of stock market for 2008 general election are reported in Table 5. The results indicate that AABR using MM have a statistically significant higher return according to both *t*and WCSRT on day 0, 1, 2, 5, 9, 13 and 20, additionally, day-2 only for *t*-values and day -5 for only *z*-test. As opposed, the MMG AABR *t*-values and *z*-values reveals that the returns are negative and statistically significant excess return on day 0, day +1, day +2, day +5, day +13, and day +20. Further, according to *t*-test day -2 is positive and statistically significant, while, according to *z*-test day 5 before, and day 9 after the event both are positive and is significantly different from zero.

Using *t*-test and *z*-test, the MM CAABR results reveal that all of the returns are statistically insignificant except day 20 (i.e. -3.869%) after the event, hence, we cannot reject the null hypothesis at the 5 percent level. Likewise, MMG CAABR have a negatively statistically significant higher return on day +13, day +17, day +18 i.e. -3.237%, -3.647% and -3.379% respectively for *t*-values, whereas, day +20 (-4.348 percent) is negatively statistically significant according to both *t*-values and *z*-values.

Table 5: AABR and CAABR using MM and MMG of Stock Market (2008 National Election)

Days	AABR				CAABR			
	t-test		WCSRT (*z*-test)		*t*-test		WCSRT (*z*-test)	
	MM	MM G	MM	MM G	MM	MM G	MM	MM G
Day -20	-0.00288	-0.00301	-0.00288	-0.00301	-0.00288	-0.00301	-0.00288	-0.00301
Day -19	0.00190	0.00177	0.00190	0.00177	-0.00097	-0.00124	-0.00097	-0.00124
Day -18	-0.00256	-0.00271	-0.00256	-0.00271	-0.00353	-0.00395	-0.00353	-0.00395
Day -17	-0.00044	-0.00054	-0.00044	-0.00054	-0.00397	-0.00449	-0.00397	-0.00449
Day -16	-0.00014	-0.00024	-0.00014	-0.00024	-0.00411	-0.00473	-0.00411	-0.00473
Day -15	-0.00114	-0.00123	-0.00114	-0.00123	-0.00524	-0.00596	-0.00524	-0.00596
Day -14	0.00166	0.00157	0.00166	0.00157	-0.00358	-0.00439	-0.00358	-0.00439
Day -13	0.00324	0.00312	0.00324	0.00312	-0.00033	-0.00127	-0.00033	-0.00127
Day -12	0.00002	-0.00007	0.00002	-0.00007	-0.00031	-0.00134	-0.00031	-0.00134
Day -11	0.00005	-0.00006	0.00005	-0.00006	-0.00026	-0.00140	-0.00026	-0.00140
Day -10	0.00261	0.00252	0.00261	0.00252	0.00236	0.00112	0.00236	0.00112
Day -9	-0.00029	-0.00039	-0.00029	-0.00039	0.00207	0.00074	0.00207	0.00074
Day -8	0.00085	0.00076	0.00085	0.00076	0.00291	0.00149	0.00291	0.00149
Day -7	-0.00654	-0.00663	-0.00654	-0.00663	-0.00363	-0.00514	-0.00363	-0.00514
Day -6	-0.00129	-0.00138	-0.00129	-0.00138	-0.00492	-0.00652	-0.00492	-0.00652
Day -5	0.00186	0.00177	0.00186	0.00177	-0.00306	-0.00475	-0.00306	-0.00475
Day -4	-0.00274	-0.00284	-0.00274	-0.00284	-0.00580	-0.00759	-0.00580	-0.00759
Day -3	0.00130	0.00121	0.00130	0.00121	-0.00450	-0.00638	-0.00450	-0.00638
Day -2	0.00437	0.00421	0.00437	0.00421	-0.00013	-0.00217	-0.00013	-0.00217
Day -1	-0.00162	-0.00172	-0.00162	-0.00172	-0.00175	-0.00389	-0.00175	-0.00389
Day 0	-0.00406	-0.00419	-0.00406	-0.00419	-0.00581	-0.00808	-0.00581	-0.00808
Day +1	-0.00591	-0.00601	-0.00591	-0.00601	-0.01172	-0.01409	-0.01172	-0.01409
Day +2	-0.00606	-0.00641	-0.00606	-0.00641	-0.01778	-0.02051	-0.01778	-0.02051
Day +3	0.00345	0.00332	0.00345	0.00332	-0.01433	-0.01719	-0.01433	-0.01719
Day +4	-0.00160	-0.00173	-0.00160	-0.00173	-0.01593	-0.01891	-0.01593	-0.01891
Day +5	-0.00384	-0.00394	-0.00384	-0.00394	-0.01977	-0.02286	-0.01977	-0.02286
Day +6	-0.00027	-0.00037	-0.00027	-0.00037	-0.02005	-0.02323	-0.02005	-0.02323
Day +7	-0.00060	-0.00071	-0.00060	-0.00071	-0.02065	-0.02393	-0.02065	-0.02393
Day +8	-0.00008	-0.00018	-0.00008	-0.00018	-0.02073	-0.02411	-0.02073	-0.02411
Day +9	0.00305	0.00296	0.00305	0.00296	-0.01768	-0.02115	-0.01768	-0.02115
Day +10	-0.00153	-0.00165	-0.00153	-0.00165	-0.01921	-0.02280	-0.01921	-0.02280
Day +11	-0.00102	-0.00113	-0.00102	-0.00113	-0.02022	-0.02392	-0.02022	-0.02392
Day +12	0.00058	0.00048	0.00058	0.00048	-0.01964	-0.02344	-0.01964	-0.02344
Day +13	-0.00878	-0.00893	-0.00878	-0.00893	-0.02842	-0.03237	-0.02842	-0.03237
Day +14	0.00203	0.00189	0.00203	0.00189	-0.02639	-0.03049	-0.02639	-0.03049
Day +15	-0.00011	-0.00022	-0.00011	-0.00022	-0.02650	-0.03070	-0.02650	-0.03070
Day +16	-0.00189	-0.00201	-0.00189	-0.00201	-0.02839	-0.03272	-0.02839	-0.03272
Day +17	-0.00365	-0.00375	-0.00365	-0.00375	-0.03204	-0.03647	-0.03204	-0.03647
Day +18	0.00283	0.00268	0.00283	0.00268	-0.02921	-0.03379	-0.02921	-0.03379
Day +19	-0.00022	-0.00033	-0.00022	-0.00033	-0.02943	-0.03412	-0.02943	-0.03412
Day +20	-0.00926	-0.00936	-0.00926	-0.00936	-0.03869	-0.04348	-0.03869	-0.04348

Note: AABRs and CAABRs that are significant at 5% level of significance according to *t*-test and *z*-test are underlined.

CAABRs using MM and MMG for Various Intervals of Stock Market for 2008 Election

Table 6 reports the MM and MMG CAABR for different time intervals of stock market for 2008 general election. The results indicate that the CAABR are statistically significant for three time windows i.e. (-20, +20), (0, +5) and (-1, +1) having return of -3.86, -1.80 and-1.16% respectively as evident from both *t* and *z*-test. Window (-1, 0) has a significant return of -0.568% only according to *z*-test. As opposed, the MMG CAABR results show that there is a negative statistically significant excess returns in the four time windows as per both *t*-values and *z*-values i.e. (-20, +20), (0, +5), (-1, +1), and (-1, 0), additionally, the

time window (-5, +5) is negative and statistically significant according to only *z*-values.

Table 6: CAABRs using MM and MMG, t-test, and WCSRT for Various Intervals of Stock (2008 Election)

Period		CAABR			
		t-test		WCSRT (*z*-test)	
		MM	MMG	MM	MMG
-20	+20	-0.03869	-0.04348	-0.03869	-0.04348
		(***-2.1645***)	(***-2.4329***)	(***-1.968***)	(***-2.280***)
-10	+10	-0.01895	-0.02140	-0.01895	-0.02140
		(-1.4741)	(-1.6708)	(-1.219)	(-1.431)
-5	+5	-0.01485	-0.01634	-0.01485	-0.01634
		(-1.5844)	(-1.7439)	(-1.847)	(***-2.026***)
0	+5	-0.01802	-0.01897	-0.01802	-0.01897
		(***-2.6227***)	(***-2.7628***)	(***-3.287***)	(***-3.391***)
-1	+1	-0.01159	-0.01193	-0.01159	-0.01193
		(***-2.7413***)	(***-2.8223***)	(***-3.387***)	(***-3.429***)
-1	0	-0.00568	-0.00591	-0.00568	-0.00591
		(-1.9128)	(***-1.9920***)	(***-2.967***)	(***-3.008***)

Note: *t*-values and *z*-values are in parentheses at 5% level of significance

AABR and CAABR using MM and MMG of Stock Market for 2013 National Election

The stock market AABR and CAABR for MM and MMG for the time windows around 2013 national election are shown in Table 7. The *t*-values reveal that there is a positive MM AABR on day 18, 12, 11, 10, 6 before, and on day 2, 4, 5, 12, 13, 14 after the event, in addition. Furthermore, the *z*-values of MM AABR reports in the same manner that 12th, 10th and 6th day before and 4th, 5th, 13th and 14th day after the event are positive, additionally, day -18, -3, -1 and day +1, +2, +3, +12, +20 are negative and reveals a significantly different from zero returns. Likewise, the results of AABR using MMG indicate that there is a higher statistically significant return on day 18, 12, 10, 6 before and on day 1, 2, 7, 12, 13, 20 after the event according to *t*-test. Whereas, WCSRT values report that MMG AABR are statistically significant on day -18, day -12, day -10, day -3, day -1, the event day, day +1 to day +4, day +12, day +13, day +19 and day +20.

The MM CAABR from day -10 till day -2, and day +15 are positive and statistically significant as per *t*-values, as opposed, *z*-test of CAABR using MM shows a statistically insignificant for the entire time window i.e. from day 20 before till day 20 after the event. Similarly, MMG CAABR *t*-values and WCSRT reveal a statistically insignificant result in the complete time window from day -20 to day +20.

Table 7: AABR and CAABR using MM and MMG of Stock Market (2013 National Election)

Days	AABR				CAABR			
	t-test		WCSRT (*z*-test)		*t*-test		WCSRT (*z*-test)	
	MM	MM G	MM	MM G	MM	MM G	MM	MM G
Day -20	-0.00280	-0.00300	-0.00280	-0.00300	-0.00280	-0.00300	-0.00280	-0.00300
Day -19	0.00460	0.00435	0.00460	0.00435	0.00180	0.00135	0.00180	0.00135
Day -18	-0.00453	-0.00482	-0.00453	-0.00482	-0.00273	-0.00346	-0.00273	-0.00346
Day -17	-0.00148	-0.00198	-0.00148	-0.00198	-0.00421	-0.00544	-0.00421	-0.00544
Day -16	0.00134	0.00075	0.00134	0.00075	-0.00287	-0.00469	-0.00287	-0.00469
Day -15	-0.00117	-0.00169	-0.00117	-0.00169	-0.00404	-0.00638	-0.00404	-0.00638
Day -14	0.00429	0.00351	0.00429	0.00351	0.00025	-0.00287	0.00025	-0.00287
Day -13	0.00375	0.00312	0.00375	0.00312	0.00399	0.00025	0.00399	0.00025
Day -12	0.00781	0.00722	0.00781	0.00722	0.01180	0.00747	0.01180	0.00747
Day -11	0.00451	0.00395	0.00451	0.00395	0.01631	0.01142	0.01631	0.01142
Day -10	0.00773	0.00710	0.00773	0.00710	0.02404	0.01852	0.02404	0.01852
Day -9	0.00298	0.00235	0.00298	0.00235	0.02702	0.02088	0.02702	0.02088
Day -8	0.00131	0.00074	0.00131	0.00074	0.02833	0.02162	0.02833	0.02162
Day -7	-0.00111	-0.00170	-0.00111	-0.00170	0.02722	0.01992	0.02722	0.01992
Day -6	0.00559	0.00491	0.00559	0.00491	0.03280	0.02483	0.03280	0.02483
Day -5	0.00113	0.00052	0.00113	0.00052	0.03393	0.02535	0.03393	0.02535
Day -4	0.00117	0.00041	0.00117	0.00041	0.03511	0.02577	0.03511	0.02577
Day -3	-0.00130	-0.00194	-0.00130	-0.00194	0.03381	0.02382	0.03381	0.02382
Day -2	-0.00373	-0.00432	-0.00373	-0.00432	0.03008	0.01950	0.03008	0.01950
Day -1	-0.00322	-0.00401	-0.00322	-0.00401	0.02686	0.01549	0.02686	0.01549
Day 0	-0.00334	-0.00418	-0.00334	-0.00418	0.02353	0.01131	0.02353	0.01131
Day +1	-0.00423	-0.00527	-0.00423	-0.00527	0.01929	0.00604	0.01929	0.00604
Day +2	-0.00684	-0.00820	-0.00684	-0.00820	0.01245	-0.00216	0.01245	-0.00216
Day +3	-0.00332	-0.00461	-0.00332	-0.00461	0.00913	-0.00678	0.00913	-0.00678
Day +4	0.00502	0.00392	0.00502	0.00392	0.01414	-0.00285	0.01414	-0.00285
Day +5	0.00595	0.00490	0.00595	0.00490	0.02010	0.00204	0.02010	0.00204
Day +6	0.00039	-0.00058	0.00039	-0.00058	0.02049	0.00146	0.02049	0.00146
Day +7	-0.00428	-0.00548	-0.00428	-0.00548	0.01621	-0.00401	0.01621	-0.00401
Day +8	0.00015	-0.00137	0.00015	-0.00137	0.01637	-0.00538	0.01637	-0.00538
Day +9	-0.00028	-0.00181	-0.00028	-0.00181	0.01608	-0.00719	0.01608	-0.00719
Day +10	0.00412	0.00284	0.00412	0.00284	0.02020	-0.00435	0.02020	-0.00435
Day +11	0.00261	0.00150	0.00261	0.00150	0.02281	-0.00285	0.02281	-0.00285
Day +12	-0.00745	-0.00887	-0.00745	-0.00887	0.01536	-0.01172	0.01536	-0.01172
Day +13	0.00996	0.00755	0.00996	0.00755	0.02533	-0.00417	0.02533	-0.00417
Day +14	0.00657	0.00485	0.00657	0.00485	0.03189	0.00068	0.03189	0.00068
Day +15	0.00483	0.00328	0.00483	0.00328	0.03672	0.00396	0.03672	0.00396
Day +16	-0.00405	-0.00558	-0.00405	-0.00558	0.03267	-0.00163	0.03267	-0.00163
Day +17	-0.00237	-0.00390	-0.00237	-0.00390	0.03030	-0.00553	0.03030	-0.00553
Day +18	0.00425	0.00285	0.00425	0.00285	0.03455	-0.00268	0.03455	-0.00268
Day +19	-0.00281	-0.00411	-0.00281	-0.00411	0.03174	-0.00680	0.03174	-0.00680
Day +20	-0.00323	-0.00446	-0.00323	-0.00446	0.02850	-0.01126	0.02850	-0.01126

Note: AABRs and CAABRs that are significant at 5% level of significance according to *t*-test and *z*-test are underlined.

CAABRs using MM and MMG for Various Intervals of Stock Market for 2013 Election

The stock market CAABR using MM and MMG for different time intervals for 2013 national election is reported in Table 8. The *t*-values and *z*-values reveal that MM CAABR have a negative statistically significant abnormal return in two out of six time windows i.e. (-1, +1) and (-1, 0). In the same manner, there is a negative CAABR for MMG in the entire time window, whereas, the last two time windows i.e. (-1, +1) and (-1, 0) are significantly different from zero as per both *t*-test and WCSRT.

Table 8: CAABRs using MM and MMG, t-test, and WCSRT for Various Intervals of Stock Market (2013 Election)

Period		CAABR			
		t-test		WCSRT (*z*-test)	
		MM	MMG	MM	MMG
-20	+20	0.02850	-0.01126	0.02850	-0.01126
		(1.4818)	(-0.3104)	(1.352)	(0.779)
-10	+10	0.00389	-0.01577	0.00389	-0.01577
		(0.2823)	(-0.7527)	(0.179)	(-0.243)
-5	+5	-0.01271	-0.02278	-0.01271	-0.02278
		(-1.4173)	(-1.9469)	(-1.356)	(-1.755)
0	+5	-0.00677	-0.01344	-0.00677	-0.01344
		(-1.0196)	(-1.6026)	(-1.144)	(-1.454)
-1	+1	-0.01079	-0.01346	-0.01079	-0.01346
		(***-2.4367***)	(***-2.8665***)	(***-2.740***)	(***-3.109***)
-1	0	-0.00656	-0.00819	-0.00656	-0.00819
		(***-2.1553***)	(***-2.5913***)	(***-2.604***)	(***-3.004***)

Note: *t*-values and *z*-values are in parentheses at 5% level of significance

Conclusion

Market efficiency semi strong form suggests that all public information and past material are incorporated in the stock prices. Therefore, a strategy based on such information should not be able to earn abnormal returns. The study investigates the semi-strong market efficiency in Karachi stock exchange around general elections.

The analysis of average abnormal return (AABR) and cumulative average abnormal return (CAABR) using market model (MM) and GARCH market model (MMG) of stock market around 1997 national election that AABR for MM and MMG have a statistically significant abnormal returns. In contrast, CAABR based on MM and MMG have significantly different from zero after the event.

The examinations of AABR and CAABR for market model and GARCH market model of stock market around 2002 national election reveal that the return are insignificant before and on the event day but statistically significant after the event. The same results also evidenced for the CAABR based on MM and MMG. In addition, these returns are negative for most of the days for both AABR and CAABR using MM and MMG. Hence, the analysis reveals that there is a negative statistically significant abnormal return after the event meaning that the market fails to fully anticipate public information.

The reaction of stock prices around 2008 general election show that AABR and CAABR using market model and GARCH market model conclude that the return using MM and MMG are insignificant for the entire window except for two days before, the event day, and six days after the event. The responses of stock returns before the event are statistically insignificant and show significant result for only four days after the event. The study has also considered different time intervals for the analysis of CAABR by employing both MM and MMG. The results indicate that CAABR shows a statistically significant excess return in five time windows out of six.

The results of returns around 2013 national election are almost the same as to the previous results and thus reinforce the previous results. Both AABR and CAABR utilizing MM and MMG indicate a statistical significant result before and after the general election of 2013. The evidence indicates that MM and MMG AABR have a statistically significant excess returns both before and after the event. On the other hand, CAABR is statistically different from zero only for day -10 to day -2 and day +15 according to only MM *t*-test. The CAABR MM *z*-values and MMG *t*-test and *z*-values have insignificant returns in the complete time window. Moreover, MM and MMG CAABR that is considered for various time intervals reports significant returns for two out of six time frames. These returns are negative indicating the loss in trading around the aforementioned national election.

The above evidences indicate that Karachi stock exchange exhibit inefficient behavior and investor by applying fundamental analysis can beat the market. Results indicate drastic changes in stock prices around these general elections. The implications of the study are that investor should take precautionary steps before trading in stock in the period of political uncertainty in the era of national election. So risk averse investor should avoid trading around national elections to defray the superfluous risk linked with the national election.

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