SHAREHOLDERS' RESPONSES AT THE ANNOUNCEMENT OF THE CHANGES IN EXECUTIVE DIRECTORS AND SIMI-STRONG FORM EFFICIENT MARKET HYPOTHESIS: EVIDENCE FROM COLOMBO STOCK EXCHANGE (CSE)

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Abstract— *This study analyzes the shareholders' responses at the announcement of the changes in executive directors of the companies listed on the CSE thereby provides a test of the semi-strong form efficient market hypothesis of Sri Lankan Share Market by using event study mythology. The sample consists of 66 listed companies, which made 156 of public announcements of the changes in the executive director on the CSE from 2009-2013. The Mean Adjusted Model, the Market Adjusted Model, and the Market Model along with proxy of the CSE All Share Price Index (ASPI) were used in this study in generating abnormal returns surrounding subsequent each announcement. Specifically, the Market model was used by incorporating cluster volatility effect and information asymmetric effects to get a strong conclusion. Apart from that Time Series models such as AR, MA, ARMA, GARCH, TARCH and EGARCH in relation to the stylized facts of each company returns within the sample specially to minimize the use of bias of the CSE All Share Price Index as a proxy in generating abnormal returns. Overall results of shareholders' responses to the changes in directors' announcements based on each model along with the proxy of CSE all-share price index show the negative reaction for information subsequent to the changes in directors' announcements in CSE. The abnormal returns appear on a prior to the actual announcement of the information, as well as after the actual announcement of the information. It confirms that the shareholders respond negatively before and after the actual announcement of the information. In addition, these results confirm that the Sri Lankan Share market is inconsistent with semi-strong form market efficient hypothesis. These findings will be important to all parties interested in the share market. Especially, it is more important to the investors, the managers of the companies and the stock exchange regulatory agencies in their decision-making process.*

Keywords— **Event study, Information efficiency and Capital market**

I. INTRODUCTION

Information is vital in valuing the stocks as they alter risk-return profile of the underling Firms. In estimating value of stocks, you need to understand the changing risk return profile of the firm with the new information. The price changes in the stock market occur depending on the investors' judgment on the information. They may react positively or negatively on the information. The positive reaction suggests more investors start demanding the shares of the company which announced information whereas negative reaction means the investors start selling shares in the market. The reaction of investors to the published information is well established area in the corporate finance and academics and practitioners have very extensively investigated this phenomenon. However, preliminary reading revealed that much of the studies based on developed stock markets and when it comes to emerging markets there is a vacuum in the literature largely in comparative terms. In Sri Lanka few attempts have been made to test the relevance of corporate public announcements in assessing stock prices hence, an investigation of the different types of corporate public announcements and shareholders' responses becomes relevant to the CSE. The empirical findings of this study have practical implications for both the investors and policy makers. In particular, potential investors can exploit significant abnormal returns trading around information subsequent to the changes in executive directors of listed companies. In addition, the government can adopt an adequate regulatory framework that secures the transparency and the efficiency of the CSE. The following sections are organized as follows. Section II, III and IV describe the particular research problem and the objectives of the study and the hypothesizes of the study respectively. The selected prior studies which are highly associated in this are discussed in section V. The conceptual framework of the study is provided in section VI. Section VII gives detail

explanation about the methodology of the study. The analysis and discussion takes place in the section VIII. Finally, the study ends up with the conclusion in the section IX.

II. Research Problem

Decision to the changes in the Board of the Company Directors is one of the frequent publicly available information that can be observed in CSE. Theoretically, change in the directors may affect positively or negatively for the performance of a particular company or its market price. It depends on the performance of the directors. There are studies in this respect in other markets. However, so far there is no research-based evidence in CSE. Therefore, this study answers the following research questions.

- How do the shareholders respond as soon as the information of the Changes in the Executive Directors Announcements is published?
- How far does the Semi-Strong Form Efficient Market Hypothesis act according to the subsequent information announcements?

III. Objectives of the Studies

The objective of this study is to examine how the stock price reacts as soon as the information of the changes in the executive directors' announcements is published thereby provides a test of semi-strong form efficiency of Sri Lankan Share Market.

IV. HYPOTHESES

In finance literature, there are mainly three hypotheses namely no price effect, positive price effect and negative price with respect to new information announcements (Asquith and Mullins, 1986). It uses to develop hypothesis 1 (H_1) is as follows. Efficient Market Theory (Fama,1970) is used in developing the hypothesis 2 (H_2) in order to measure the market efficiency.

H_1: The shareholders respond negatively at the announcement subsequence to a Decision to changes in the Directors.

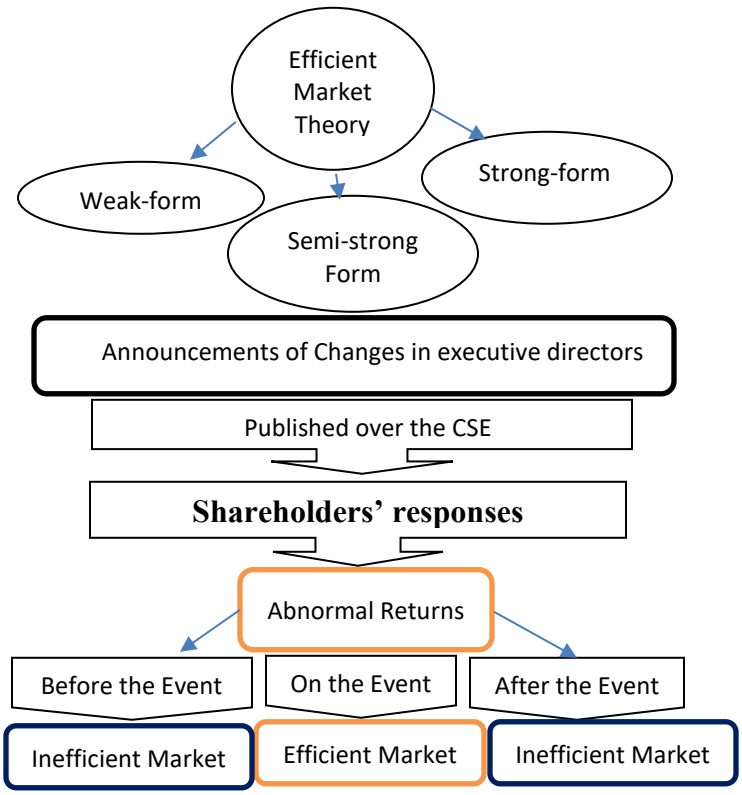
H_2: Information subsequent to a public announcement of the change in the Directors reflect fully and instantaneously on share prices.

V. PRIOR LITERATURE

Warner et al. (1988) investigated the relationship between a firm's stock price performance and subsequent changes in its top management. The sample consisted of 269 firms listed on the NYSE and AMEX from 1963-1978. The event study results indicated that individual securities had a very small stock price reaction at announcement of a top management change but the average effect was zero.

In a similar way, Bonnier and Bruner (1989) analyzed the excess return to shareholders at announcement of change in senior management distressed firms. The sample consisted of all firms listed on the NYSE and AMEX from 1969-1983. The results showed that the abnormal were significantly positive at announcement of change in senior management distressed firms. Rosenstein and Wyatt (1990) have focused on the stock market reaction to the appointment of outside directors and reported a significant increase in stock prices on the day of the announcement when firms appoint additional outside directors for a sample of large US firms. Further, Rosenstein and Wyatt (1997) studied stock price reaction to appointments of inside directors. In general, they found that stock prices were not significantly different from zero when inside director was added to the board. In a parallel study, Sorasart (2003) found out that there was no significant stock price effect of adding inside or outside director to the board on a sample of listed firms in Thailand. Rhim et al, (2006) found that stock markets responded more positively to unanticipated change of CEO as compared to that of anticipated change in US firms. In Cyprus, Nikos and Adamos (2009) investigated the stock price performance of 166 firms appointing a new Chief Marketing Officer (CMO) between 1999 and 2005. Using event study methodology, the results revealed that abnormal stock returns around the appointment day were greater for firms appointing a CMO with prior marketing executive experience.

VI. CONCEPTUAL FRAMEWORK



VII. METHODOLOGY

This study employs the event study methodology. However, this study enriches the event study method even by incorporating stock volatility clustering phenomenon and information asymmetric effects to the Market Model. Also, the event study method is further extended with the application of volatility time series techniques instead of market model, mean adjusted model and mean adjusted models. Taking the fact which is, especially availability of data this study has selected 66 listed companies which made 156 public announcements of the change in the executive director on the CSE from 2009-2013. Necessary data is collected through the Daily Market Reports published by the CSE and Computerized Data Base System of them. The sample has been selected purposively assigning the applicable criterion. For example, there should not be another published announcement during the event window. It is assumed that the event impact is limited to the 31 trading days. Thus, the total event period that is to be examined is 31 trading days. The event period starts with the day, immediately before the event date and goes back to 15 trading days. It closes with the day immediately after the event date and goes ahead to 15 trading days. This period is divided into three windows, namely pre-event window (-15 to -1), event window (0-day) and post-event window (+1 to +15). The event window represents immediate market reaction. Pre-event window and post-event window represent earlier and delayed market reactions respectively. The prior researchers used different periods for an estimation period. For examples, Brown and Warner (1985) selected 239 days prior to the event. Chew and Liang (1993) used 100 days prior to the event in order to estimate parameters for their study. Bandara (2001) an estimation period of 200 days used in his study for the estimate window. Dharmarathne (2013) used 120 days prior to the event for the estimate window. As there are no well-defined criteria for the estimate period this study uses 120 of past returns over the pre-identified estimation window to estimate the return generating models.

Model is used to calculate Actual Returns

$$\mathbf{R_{i,t}} = \mathbf{LN}\left(\frac{\mathbf{P_t}}{\mathbf{P_{t-1}}}\right) \quad (1)$$

Where,

$R_{i,t}$ = Rate of return of firm *i* on day *t*
LN =Natural Logarithm
P_t = Closing share price on day *t* (current trading date)
P_{t-1} = Closing share price on day *t-1* (previous trading date)

Models are used to calculate Expected Returns

1. Mean Adjusted Model

$$R_{i,t} = \mu^i \quad (2)$$

Where,
R_{it}= Expected return on company *i* on day *t*
μ^i = Average returns of 120 of past returns of company *i*

2. Market Adjusted Model

$$\mathrm{MAAR_{it}} = \mathrm{R_{it}} - \mathrm{R_{mt}} \quad (3)$$

Where,
$MAAR_{it}$ = Market adjusted abnormal return for security *i* over time *t*,
R_{it} = Time *t* returns on security *i,* calculated as *LN* (P_{it}/ P_{it-1}). Where, P_{it} is the market closing price of stock *i* on day *t*. P_{it-1} is the market closing price of stock *i* on day *t-1*
R_{mt} = Time *t* returns on the CSE all-share price index or total return index calculated as *LN* (I_t/ I_{t-1}.). Where, it $_{is}$ the market index on day *t*. $I_{t-1\ is}$ the market index on day *t-1.*

3. Market Model

$$\mathrm{R_{i,t}} + \alpha_i + \beta_i \mathrm{R_{m,t}} + \varepsilon_{i,t} \quad (5)$$

Assumptions: $\mathrm{E}(\varepsilon_{i,t} = 0)$ and $\mathrm{VAR}(\varepsilon_{i,t}) = \sigma^2_{\varepsilon_i}$

Where,

R_{it}= Rate of return of security on day *t*
R_{mt}= Rate of return on a market portfolio of stocks on day *t*.

α_i = Intercept term (alpha)
β_i = Systematic risk of stock *i* (beta) and
ε_{it} = Regression error term

4. Volatility Time Series Models (Cable and Holland ,1999)
   I. Developing Autoregressive (AR) Model

$$\boldsymbol{Y_t = \Phi_0 + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \cdots + \Phi_r Y_{t-r} + \varepsilon_t} \quad (6)$$

Where, Y_t = the expected returns for the period t, Φ_i = the autoregressive coefficients and ε_t = the residual in the forecasting equation

II. Developing Moving Average (MA) Model

$$\boldsymbol{Y_t = \theta_0 + \varepsilon_t - \theta_1\varepsilon_{t-1} - \theta_2\varepsilon_{t-2} - \ldots - \theta_s\varepsilon_{t-s}} \quad (7)$$

Where, Y_t = the expected returns for the period t, θ_i = the moving average coefficients and ε_t = the residual in the forecasting equation.

III. Developing Mixed ARMA Model

$$Y_t = \varepsilon_t + \sum_{i=1}^{r} \Phi_i Y_{t-r} - \sum_{j=1}^{s} \theta_j \varepsilon_{t-s} \quad (8)$$

IV. GARCH (p, q) Model (Bollerslev, 1986)

$$\boldsymbol{\sigma_t^2 = \omega + \sum_{i=1}^{q} \alpha_i \varepsilon_{t-i}^2 + \sum_{i=1}^{p} \beta_i \sigma_{t-i}^2} \quad (9)$$

V. Exponential GARCH (EGARCH) Model (Nelson, 1991)

$$\boldsymbol{Log(\sigma_t^2) = \omega + \sum_{j=1}^{q} \beta_j Log(\sigma_{t-j}^2) + \sum_{i=1}^{p} \alpha_i \left|\frac{\varepsilon_{t-i}}{\sigma_{t-i}}\right| + \sum_{k=1}^{n} \gamma_k \frac{\varepsilon_{t-k}}{\sigma_{t-k}}} \quad (10)$$

VI. Threshold GARCH (TGARCH) Model (Zakoian,1994; Glosten et al., 1993; Engle and Ng, 1993; Tsay, 1998)

$$\boldsymbol{(\sigma_t^2) = \omega + \sum_{j=1}^{q} \beta_j \sigma_{t-j}^2 + \sum_{i=1}^{p} \alpha_i \varepsilon_{t-i}^2 + \sum_{k=1}^{n} \gamma_k \varepsilon_{t-k}^2 d_{t-k}} \quad (11)$$

5. Calculation of Abnormal Returns

$$\boldsymbol{AR_t = R_t - Y_t} \quad (12)$$

Where,

AR_t = Abnormal Return at time *t*

R_t = Actual Returns at time *t*

Y_t = Normal Returns at time *t*

6. Calculation of Average Abnormal Returns (AARs)

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \quad (13)$$

Where,

AAR_t = Average abnormal return for day *t*

N = Number of events in the sample

7. Calculation of Cumulative Average Abnormal Returns (CAARs)

$$CAAR_p = \sum_{t=1}^{p} AAR_t \quad (14)$$

Testing Significance

Even though, a researcher had found large abnormal returns, it must be proved that the results are not gained by coincidentally or by biased time series. The assumption here is that the daily abnormal returns are distributed identically and independently. It is also assumed that over a long time stock prices have a tendency to approach the expectation value (mean value). This study uses t-test. The variables AR, CAR, AAR and CAAR are used to measure the informational content of the selected announcements and the efficiency with which this information is impounded into the share price. The null hypothesis is that AR, CAR, AAR and CAAR is drawn from a distribution with zero means; that means announcements of the events have a systematic effect on respective share prices on the particular event announcement date. The null hypothesis is rejected, if the t-values obtained from the calculations are higher than the critical values.

1. Significance Testing (Parametric) for AAR

$$T(AAR) = \frac{AAR_t}{SE(AAR_t)} \quad (15)$$

Where,

AAR_{it} = Average Abnormal Return for Company i for a day of the event window.

$SE(AAR_{it})$ = Standard Error of Average Abnormal Return of a company i during the estimated period.

2. Significance Testing (Parametric) for $CAAR_t$

$$T(CAAR) = CAAR_t \Big/ SE(CAAR_{it}) \quad (16)$$

Where,

CAR = Cumulative AAR for Company *i* for the selected event window.

$SE(CAR_{it})$ = Standard Error of Cumulative AAR of a company *i* during the estimated period.

Measuring Market Responses

First objective of this study is to investigate the stock market reactions as soon as the selected information is published. The most appropriate way of reporting the results should be in a table and a graph in order to facilitate the discussion of results. The results, which will be derived through the above steps, can be presented in a graph in order to get a clear idea. Each test results provide daily AAR and CAAR and their t-statistics for the 31 days surrounding the particular

announcement date (day 0). As the final step, the relevant graphs will be presented for each test event. As these graphs cover a lengthy event window, the readers can easily identify anticipation effects and delayed responses. In the graphs, X-axis indicates the event period from day -15 to +15 day and the Y-axis indicates the CAAR.

By using, the facts presented as above-mentioned way, behavior of CAAR can be discussed. If CAAR has increased during the event period, it can be stated that share price has positively responded to the announcement and vice versa. Any CAAR increase prior to the announcement date having a same tendency with significant CAAR or AAR then it will be treated as anticipation. On the other hand, if CAAR is having a continuously increasing/decreasing pattern from the event date with significant CAAR/AAR it indicates that the share prices are still adjusting to the new information. This is delayed response.

Testing Market Efficiency

The market efficiency will be tested using the framework of the Semi-Strong Form Efficient Market Hypothesis (see; Malkiel, and Fama, 1970). If the market is semi-strong efficient, the adjustment of prices to the outcome of the particular event should occur in a very short period (event window) and there are no trading strategies adopted to earn abnormal returns after that. As explained under significant testing, the significant changes of AAR or CAAR can exist only on event window day (0-day), if the market response to the new information is efficient. Existence of material anticipation or delayed response evidence, that the market is not informational efficient.

VIII. ANALYSIS AND DISCUSSION

The daily average abnormal returns (AAR) and Cumulative average abnormal returns (CAAR) of 156 change in executive directors' announcements stocks over a window period starting from day –15 to day +15 relative to the change in executive directors' announcement day (0-day) at overall portfolio level are analyzed and reported as follows. Thus, the results generated from each model within 31-day window period are presented in Figure 1. The results gained from the Mean Adjusted Model show that AAR on the day 0 is 0.003, which is not statistically significant. It indicates that the investors do not earn abnormal returns on the event day itself. Nevertheless, it shows that the AAR on the days, -12, -9, and -4 are negatively significant during the pre-event window. It implies that this information is revealed to the market before publishing. Moreover, it shows that during the post-event window, AAR on the 8^{th} and 12^{th} is statically significant. It means that the investors earn abnormal returns a few days after publishing the event. Subsequently, the daily AAR calculated using market-adjusted model shows slight different results compared with mean adjusted model. In this case, AAR on the days, -12 and -9 within the pre-event window are negative and statistically significant. It indicates the information is revealed before publishing to the market. In addition, it shows that AAR on the day 13 is negatively statistically significant. It is evidence that the investors respond a few days after the event is published. Thus, the results generated from the same sample employing market model are discussed in this study. 120 of past individual company returns and market returns over the pre-identified estimation window are used to estimate the market model. It is important to notice that 40 of 156 events show ARCH effects. Because of that, GARCH, TARCH and EGARCH models are used depend on the effects. The results report in this case, AAR on the days, -12 and -4 within the pre-event window are negative and statistically significant. It indicates the information is revealed before publishing to the market. In addition, it shows that AAR on the day 12 during the post-event window is negatively statistically significant. It is evidence that the investors respond a few days after the event is published. Apart from those the results generated from the same samples using different time series models, which appropriate to each individual event. Some events are fitted with ARMA models and some are fitted with GARCH models based on the stylized facts of each returns. The AAR over a window period starting from day –15 to day +15 relative to the announcement day (0-day) at overall portfolio level show that somewhat different results compared with the above used models. It shows that AAR on the 0-day is not statistically significant. It indicates that the investors do not gain abnormal returns for this event on the event day itself. However, it shows that AAR on the -12-day, -9-day and -4-day are negative and statically significant. It indicates that the investors gain abnormal returns before publishing the particular event.

Figure 1. AAR generated from each model

Overall results of CAAR in relation to the changes in directors' announcements based on each model show in Figure 2. The CAAR line corresponding to the Mean Adjusted Model fluctuates negatively during the entire window period. The results show that CAAR, on the days, -14, and -9 are -0.012 and -0.018 respectively and statistically significant. It implies that the market reacts negatively for this event. Then the CAAR line corresponding to the Market Adjusted Model fluctuates also negatively during the entire window period. However, it shows clearly, the CAAR line moves negatively during the entire window period and the results shows that 26 days of 31 days are statistically significant. Similarly, the results reported from the Market Model are plotted in Figure 2. It shows how the daily CAAR behave during 31-window period. It shows clearly, the respective CAAR line moves negatively during the entire window period and the results shows that 9 days of 31 days are statistically significant. It shows that clearly, the CAAR line of Time series models moves negatively during the entire window period and the results shows that 14 days of 31 days are statistically significant. It is an implication that market reacts negatively to information subsequent to change in directors' announcement. It is an implication that market reacts negatively to information subsequent to the changes in directors' announcement.

It appears that all the models show negative reaction information subsequent to change in directors' announcements in CSE. The abnormal returns appear on a prior to the actual announcement of the information, as well as after the actual announcement of the information.

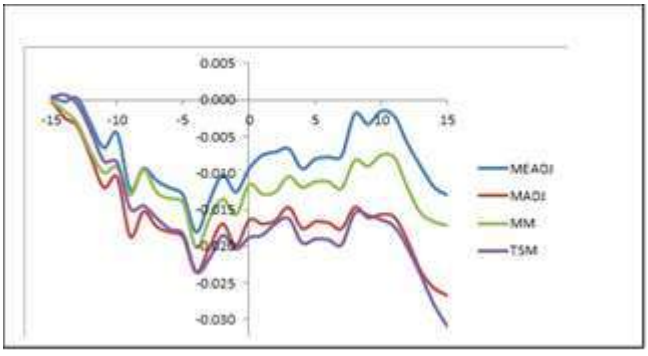
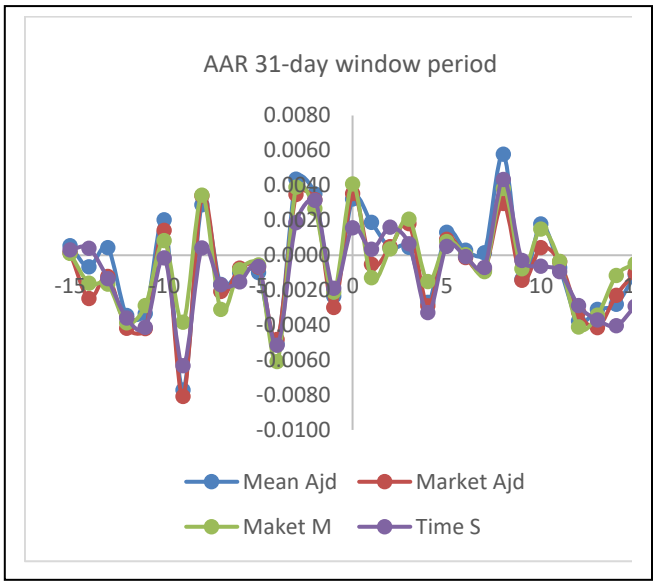


Figure 2. CAAR within 31-day period from each model

It confirms that this announcement has an important informational content. Also, it is unfavorable news for investors. In addition, the analysis shows that there are earlier reactions and delayed reactions information subsequent to a public announcement of this event. It confirms that share price does not seem fully and instantaneously reflect the information contained in the announcement of stock announcement



IX. CONCLUTION

This study analyzed the shareholders' responses in announcement of the changes in executive directors of the companies listed on the CSE. The sample consisted of sixty-six (66) listed companies which made 156 public announcements of change in the executive director on the CSE from 2009-2013. Overall results of the market responses to the change in directors' announcements based on each model show that abnormal returns appear subsequent to the event. The abnormal returns appear only a prior to the actual announcement of the information, as well as after the actual announcement of the information. It confirms that the market responds negatively before and after the actual announcement of the information. Further, it confirms that this announcement has an important informational content. Also, it is unfavorable news for the investors. In addition, the analysis shows that there are earlier reactions and delayed reactions information subsequent to a public announcement of this event. It confirms that the share price does not seem fully and instantaneously reflect the information contained in the announcement of the stock announcements. Finally, the results confirm significant difference between the Sri Lankan market and the other developed markets.

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