

Impact of Insider Trading on Share Returns: Evidence from Sri Lanka

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ABSTRACT

Insider trading is a crucial topic for investors in the stock market. This study investigates whether corporate insiders' trading significantly affects the share returns of listed companies on the Colombo Stock Exchange (CSE). This research further examines the relationship between insiders' purchases/sales and abnormal returns. This study examines the purchases and sales of insiders from randomly selected 37 listed companies from January 2012 to March 2022 using event study methodology, taking the announcement day as Day 0. A total of 97 transactions were used for this study. This study used the market model to calculate the alpha and beta coefficients of the risk-adjusted return for insider transactions. And t-values of Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR) were calculated to determine the significance of the findings. This study found a positive and significant CAAR from Day 01 after the announcement day for insider purchases. A negative and significant CAAR was only for Day 01 afterward, a positive and not significant CAAR was found for insider sales. The study's findings support that insider trading impacts the share returns at CSE. Further, this study observed positive CAAR for all insider transactions, meaning that the actual return is greater than the expected return for all insider transactions. Further, it revealed that the Sri Lankan stock market is immediately reacting to insider trading announcements, which is evidence for a semi-strong form of an efficient market hypothesis. However, it never showed any concrete evidence of information asymmetry in the market.

Keywords: Insider trading, Efficient market hypothesis, Information asymmetry hypothesis, Abnormal return, Event study methodology

INTRODUCTION

In the ever-evolving landscape of financial markets, the intricate interplay between information, decision-making, and market efficiency is the cornerstone of investor confidence and the promotion of equitable trading practices. Among the various factors influencing share returns, insider trading stands out as a phenomenon that can significantly shape the trajectory of share returns. Insiders, including directors, owners, and employees, can engage in trading based on potential future information about their firms. However, it's essential to note that insider trading may not always be linked to new information. Insiders' in-depth knowledge of internal management strategies about their company may help them identify the timing of investment. On the other hand, they may abuse their power to get hold of materialistic information unavailable to the public (Geyt, 2013). Also, Clacher et al. (2009) conclude in their

research that insiders can detect the mispricing of shares of their own company and use this information for their benefit. However, the insiders' trading on non-public information is considered illegal. To make the stock market a level playing field, the regulators of the stock market of almost every country in the world compel the insiders to disclose their trading to the public.

The way that markets and investors respond when corporate-related events, such as dividend announcements (Bandara & Perera, 2011) and stock splits (Gunathilaka & Kongahawatte, 2011), are announced is a key study trend related to stock markets. Likewise, another significant corporate-related event that affects the decision of investors is the announcement of insider trading. Since insider trading is an obvious example of how the lack of information may cause the loss of shareholder wealth, it has been a significant issue for scholars, investors, and regulators worldwide.

As effective regulation is needed for investor confidence and an efficient stock market, the Securities Exchange Commission of Sri Lanka (SEC) regulates the capital market. The Securities and Exchange Commission of Sri Lanka Act no. 19 of 2021 is the act used to regulate the capital market. According to the act, anyone connected to the listed company should not trade company shares if he/she gets hold of any non-public price-sensitive information. Even though there are several insiders who can trade on securities, the SEC of Sri Lanka instructs the listed companies to disclose only their directors' trading to the public.

Since Sri Lankan share market is a frontier market, there are not many studies available about insider trading. There is enough evidence available to predict the market reaction to insider trading on US stock exchanges (Tavakoli et al., 2012), (Khan et al., 2005). However, insider trading empirical research has lagged far behind in non-US nations compared to US studies, particularly in frontier markets like Sri Lanka. As a result, awareness about insider trading is very poor among Sri Lankan retailers.

This study aims to investigate whether the trading of corporate insiders significantly affects the share returns of listed companies in the CSE. If so, it further examines the relationship between insiders' purchases/sales of directors and the respective abnormal return after the announcement of insider trading.

An article available on the website of Law Net Ministry of Justice on the topic 'Insider Dealing in the Information Age' stresses that there is a need for the amendment of the laws related to insider trading. So, the study on insider trading is essential for the Sri Lankan stock market. Even though a study on the topic 'Information content of insider trading volume: Evidence from Sri Lanka (Perera & Nimal, 2017) is available, that was done for the period 2004 to 2012.

This study did not consider the recent times of the share market like Covid-19 and the recent economic crisis. Analyzing the impact of insider trading on share returns in CSE for the contemporary period will pave the way to identify the recent efficiency of the CSE.

Analyzing the speed of change in the share returns will help to determine the efficiency of the whole stock market. Analyzing how the market reacts to insider trading will provide clear evidence of whether insider trading contains potential information. It also helps to determine whether that market is exposed to efficient information. Understanding the impact of insider trading on share returns is not only crucial for investors making informed decisions but also for regulators striving to maintain integrity and fairness in the financial markets.

This paper is organized as follows. The next section presents the literature review on insider trading and its impact on share returns. In the third section, the methodology will be stated. Section four discusses the analysis and findings, and section five emphasizes the conclusion and implications of this study.

LITERATURE REVIEW

The works of literature on insider trading argue on law and economics over whether it is desirable to restrict insider trading. Some kinds of literature, like Beny (2007), Doffou (2007), and Ali and Gregoriou (2008) state that insider trading itself is an illegal act. They define insider trading as the selling or acquisition of shares by employees of a corporation who use monopolistic knowledge to their advantage to produce abnormal returns. But most empirical studies like Nanda and Barai (2020), Bacon and Roddenberry (2011), Aktas et al. (2008), Aktas et al. (2007), and Hoang et al. (2015) differentiate the legality of insider trading using the information the insider used at the time of trading. If insider trading is based on public information, it is lawful (Nanda & Barai, 2020). Hoang et al. (2015) state that not all insider trading is illegal. However, the term "insider trading" is typically used to describe illicit transactions involving significant, confidential business information.

The term insider trading has contradictory views in the literature. Academic literature on whether to outlaw insider trading has been motivated by questions regarding the information content of insider trading. Whether insider trading is unjust to public investors who are not exposed to confidential corporate information was the main topic of early legal discussion (Beny, 2007). Patterson (1967) claimed that insider trading is beneficial since it is economically efficient, in contrast to the prevailing legal and moral opinion. If insider trading is economically inefficient and, therefore, ought to be controlled by the government, or whether it is

economically efficient and should not be regulated, it is at the heart of the law and economics dispute (Beny, 2007).

The Regulation of Insider Trading

Regulators of several countries have identified illegal insider trading as a criminal offense and implemented criminal fines and jail sentences. Bajo and Petracci (2004) stated in their study that even while insider trading laws are rarely reliably followed in Italy, stock trading that occurs just a few days before market announcements would be simple to identify and prosecute. However many countries around the world effectively enforced insider trading regulations. Clacher et al. (2009) state that in the U.S, the Securities Exchange Commission has prohibited insider trading since 1934. Fisch (1991) states that in Georgia, the SEC decided that the information possessed by insiders has the obligation either to refrain from trading on that information or disclose that information to the public. The European Directive on Insider Trading and Market Manipulation from 2003 served as the basis for Belgium's existing insider trading regulations (Geyt, 2013). Beny (2007) finds out that liquid stock markets are more common in nations with stricter prohibitions against insider trading.

In Sri Lanka, insider trading is considered a serious white-collar crime, and it has been prohibited under the Companies Act and SEC Act. Part V of the Securities and Exchange Commission of Sri Lanka Act, No. 19 of 2021 contains provisions to define and penalize insider dealings with respect to all public listed companies.

On the website of the Ministry of Justice, Sri Lanka, an article was published under the heading 'Insider Dealing in the Information Age'. There mentioned that the Takeover Code, an SEC Act-created rule, regulates insider dealing in the context of takeovers. There are many similarities and variations between the insider dealing provisions of the SEC Act and the Takeover Code. That article further mentions that it is regrettable that the latest SEC Act modifications did not include any in-depth changes pertaining to insider dealing ("Insider Dealing in the Information Age," n.d.). Any delay in implementing these legal and behavioural adjustments will erode the capital market's confidence and have a negative impact on the country's economy.

However, these days the SEC of Sri Lanka is proactively penalizing individuals involved in insider trading, reinforcing a commitment to enforce the law, and foster awareness among the public investors about the consequences of such illicit activities. This vigilant approach serves to promote transparency and maintain the integrity of the financial markets, ultimately safeguarding the interests of investors.

Efficient Market Hypothesis (EMH)

Most of the studies eventually connect the abnormal values of stock characteristics after insider trading with the Efficient Capital Market Hypothesis, formulated by Fama in 1970. Fama (1970) states that the efficiency of the capital market can be divided into three categories depending on the nature of the information. In the weak form of market efficiency, the investors will be fully aware of the historical prices and volumes of securities, and historical information will be reflected in the prices of securities. The semi-strong form of the efficient market hypothesis states that the market's share prices fully reflect all the publicly held information. The information may be stock splits, dividend issues, announcements of annual earnings, mergers, acquisitions of companies, etc.

The strong form of the efficient market hypothesis indicates that share prices reflect all publicly and privately held information (Fama, 1970). But Doffou (2007) states that a strong form of efficient market hypothesis theory is not applicable in practice because insiders or non-insiders with materialistic non-public information can make abnormal returns by using that information to their advantage. So, if insiders earn abnormal share returns, the strong efficient market hypothesis turns out false.

In Sri Lanka, the efficiency of the stock market is a crucial topic to discuss. Perera and Nimal (2017) study Sri Lankan stock market and conclude that the efficiency of the CSE is doubtful in terms of how quickly the insider trading volume's information content is reflected in share price. So, CSE does not provide consistent evidence that the stock market holds an efficient market hypothesis.

Information Asymmetry Hypothesis

A mismatch in the knowledge of significant facts and information between the two negotiating sides is known as information asymmetry. The side with more information typically has a competitive edge over the opposing party due to this imbalance. Bajo and Petracci (2004) backs up the notion that an alteration in insider ownership has informational value and sends a message to the market because of the information asymmetry between insiders and private investors.

If there is a severe information asymmetry, uninformed investors may decide not to trade, making the stock market completely illiquid (Beny, 2007). He further states that the idea that allows insiders to trade on information that is only known to them (information asymmetry) harms liquidity (increases transaction costs) by reducing competition among informed traders. Geyt (2013) examined whether effective communication might lessen the profitability of

insider trading and, consequently, the information asymmetry between insiders and outsiders, using a sample of publicly traded Belgian companies. He finds out that press releases and investor relations initiatives are the most efficient means of reducing information asymmetry between insiders and outsiders.

Gunathilaka and Kongahawatte (2011) find that CSE takes in the news of the split the day it is announced, demonstrating the effectiveness of the information flow. Bandara and Perera (2011) identify that there is a significant effect on the abnormal return on the day of dividend announcement. They further say that the CSE gets delayed responses due to information asymmetry or the inability to obtain information promptly.

Empirical Review

There are several empirical studies available on the topic of insider trading. Most of them, refer to the relationship between the reported insider trading and the change in market prices of shares. Some other research analyzes how market efficiency is determined by insider trading and examines the information content of insider trading.

With reference to the empirical literature, the following hypotheses are developed to be tested in this study.

Hypothesis 01: The insider (directors) trading impacts the share returns at CSE.

According to the research done by Nanda and Barai (2020) based on BSE, by imitating any buy or sale made by a significant shareholder or by directors and executives, an outside investor can generate abnormal returns. Bajo and Petracci (2004) state that in the study on insider trading based on the Italian Stock Exchange, an abnormal market return was observed. The study done by Bacon and Roddenberry (2011) based on NYSE emphasizes that an investor can make an above-average risk-adjusted return by acting on the public announcement of the insider purchases. Hoang et al. (2015) stated that insiders could typically outperform the market. Keeping given the above-mentioned articles, Hypothesis 01 is formulated to examine the effect of insider trading on share returns.

Hypothesis 02: The abnormal return is positive for directors' purchases at CSE.

Hypothesis 03: The abnormal return is negative for directors' sales at CSE.

Bajo and Petracci (2004) found statistical evidence that a positive reaction occurs after an increase in insiders' holdings, and a negative reaction occurs after a decrease in insiders' holdings. Aktas et al. (2007) also conclude that cumulated abnormal returns are positive for the stocks bought and negative for the insider-sold stocks. Even though, the article written by Antoniadis et al. (2015) based on the Athens Stock Exchange did not give any concrete

evidence about insider purchases, they emphasize that abnormal stock return for insider sales reacts negative after the announcement of insider trading. With reference to the studies Aktas et al. (2007), Bajo and Petracchi (2004) and Bacon and Roddenberry (2011), the Hypothesis 02 and Hypothesis 03 is developed to test the relationship between the insiders' purchases/sales and abnormal returns.

METHODOLOGY

The quantitative approach and the deductive logic are used as the research logic in this study. The goal of a deductive approach is to create hypotheses based on an existing theory to test the hypothesis. To examine the impact of insider trading on share returns, purchases, and sales of insiders at CSE are considered as independent variable and the abnormal returns earned by those insiders are considered as dependent variable.

The independent variable is the secondary data of announcements of insider trading collected from CSE website. The population of considered data is all the purchases and sales of directors of all listed companies at CSE. The sample of insider trading was considered for the period from January 2012 to March 2022. During this period, random sampling method was used to select listed companies from CSE. Using this, two companies from each sector classified using Global Index Classification Standard (GICS) were selected. Two sub-samples were used in this study. They are:

1. Insider purchases of selected companies from January 2012 to March 2022.
2. Insider sales of selected companies from January 2012 to March 2022.

Additionally, this sample has been omitted directors' purchases/sales made through Employee Share Option Plans (ESOPs), Trust Deeds, Share Warrants, and directors' transactions of ordinary non-voting securities, as well as certain directors' trading events due to thin trading issues.

Also, this study only considered the trades where there were no other insider trades during the estimation and event window for the accuracy of the analysis. Respective of this assumption, Table 1 summarizes the data used for the analysis of this study.

Table 1: Summary of event study data

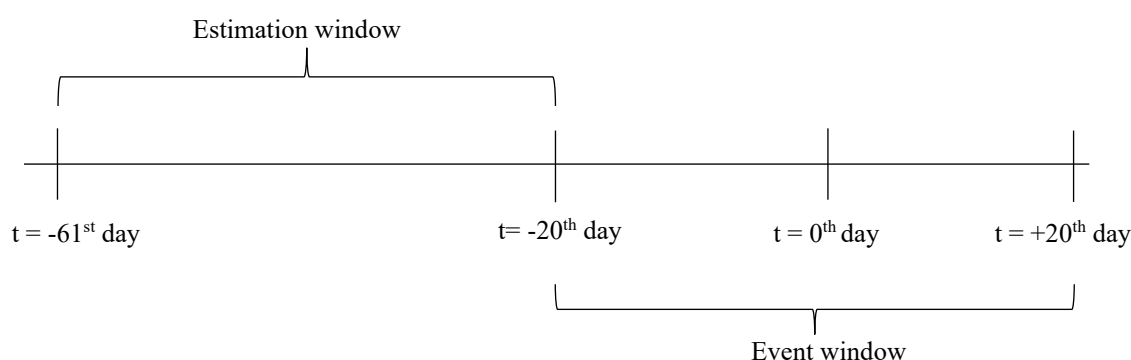
Insider transaction types	Number of events
All insider transactions	97
Insider purchases	60
Insider sales	37

Source: Author Compiled

The abnormal return is calculated using the event study methodology. To conduct an event study methodology, two time periods as estimation window and event window should be determined. The empirical studies on insider trading have adopted various event windows. Antoniadis et al. (2015) used (-20, +20) as the event windows for their research. Nanda and Barai (2020) has adopted 0th day to +20th day as the study event window. Aktas et al. (2007) used both longer and shorter event windows to investigate the abnormal return more precisely in the Amsterdam Euronext Stock Exchange. And Perera and Nimal (2017) who have done their research on listed companies at CSE, used an event window from -20th day to +20th day. This study decides to use the event window (-20, +20) to track the degree of change in share prices due to insider trading. It helps to find whether there is any significant change in the share return prior to the announcement day as well.

Even though other empirical studies used longer estimation period Nanda and Barai (2020) state that the estimation period is kept short from -90th day to -10th day. Also, Perera and Nimal (2017) state that a fixed event window of 41 days prior to the event window is used as the estimation window to estimate the beta of securities. Considering these studies, it is decided to use -61st day to -20th day as the estimation window. This study only considered the trades where there were no other insider trades during the estimation and event window.

Figure 1: Event Study Methodology



Source: Author Compiled

The empirical studies calculated the profitability of directors' trading to measure the impact on share prices. Perera and Nimal (2017) and Aktas et al. (2007) computed daily abnormal returns of directors' trading to measure the degree of change in market shares. To measure the abnormal return, there are several choices available in the empirical studies.

Following Antoniadis et al. (2015) parameters of α_i and β_i of expected return are estimated by applying the values of R_{it} and R_{mt} in the market model using Ordinary least square (OLS) regression.

The following is the equation used to find the expected return:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \mu_{it} \quad (1)$$

μ_{it} = independence disturbance term at time t

Bajo and Petracci (2004) used Market Adjusted Return Model (MAR) while Perera and Nimal (2017), Nanda and Barai (2020), and Antoniadis et al. (2015) used Risk-Adjusted Return Model (RAR). This study decided to use RAR model to compute the directors' abnormal return which is a widely used and more appropriate model. The following is the abnormal return under RAR model:

$$AR_{it} = [R_{it} - (\alpha_i + \beta_i R_{mt})] \quad (2)$$

AR_{it} = Abnormal return for security i at day t

R_{it} = Actual return for security i at day t

R_{mt} = Actual return for the market portfolio at day t

α_i and β_i are the intercept and slope respectively.

In the next step, following Perera and Nimal (2017) and Nanda and Barai (2020) research work, the Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR) across the sample is calculated for each day from -20th day to +20th day.

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad (3)$$

AAR = Average Abnormal Return at day t

N = Total number of events

$$CAAR_{(t_1, t_2)} = \sum_{t=t_1}^{t_2} AAR_t \quad (4)$$

$CAAR_{(t_1, t_2)}$ = Cumulative Average Abnormal Return from t_1 to t_2

To test the significance of the statistics, t-statistic for AAR is calculated using the following equation.

$$t - stat = \frac{AAR_t}{\sigma(AAR_t)} \quad (5)$$

$\sigma(Excess AAR_t)$ = Standard deviation of AAR across time.

The t-statistic for CAAR is calculated using the following equation.

$$t - stat = \frac{CAAR_{(t_1, t_2)}}{[\sigma^2(t_1, t_2)]^{\frac{1}{2}}} \quad (6)$$

ANALYSIS AND DISCUSSION

Following the event study methodology explained in the previous section, AR, AAR, and CAAR were calculated for all selected 97 data points. After that, the statistical significance of these values was estimated with the parametric test. According to the parametric test, the coefficient of t is calculated to determine the statistical significance of these values.

Hypothesis 01: The insider (directors) trading impacts the share returns at CSE.

Cumulative Average Abnormal Return (CAAR) is used to study whether insider (directors) trading impacts the share return at CSE. CAAR is calculated using equation (4), and the t -statistic of the CAAR is calculated using equation (6).

Table 2: CAAR and its t-values of insider transactions

	CAAR	t-value
All transaction	0.042463	2.008078
Purchases	0.045139	2.212902
Sales	0.039788	1.014674

Source: Author Compiled

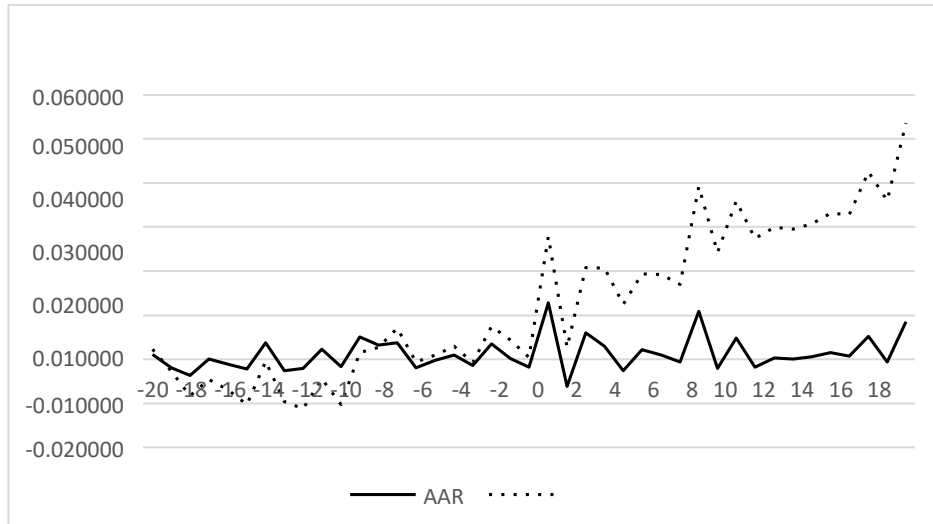
After finding the CAAR, the positive abnormal share return is identified around all insider transactions. Likewise, positive CAAR is observed for all the insiders' purchases and sales. This positive CAAR indicates that the actual share return is greater than expected after all insider transactions. So, by mimicking insider dealings, an outsider can earn a positive abnormal return. Irrespective of whether the insiders are increasing or decreasing their stake in the listed company, abnormal return is observed over the event window of the study. Overall, as the abnormal return is identified around insider transactions, the insider (directors) trading impacts the share returns at CSE as hypothesized in Hypothesis 01.

Average abnormal return and Cumulative average abnormal return and their respective t -statistics are calculated for insiders' purchases and sales separately and provided in Appendices 01 and 02, respectively. The AAR and CAAR of insider purchases and sales are presented graphically in Figure 2 and Figure 3 respectively. These graphs help to demonstrate whether

the market has responded to the directors' purchases and sales early, immediately, or slowly.

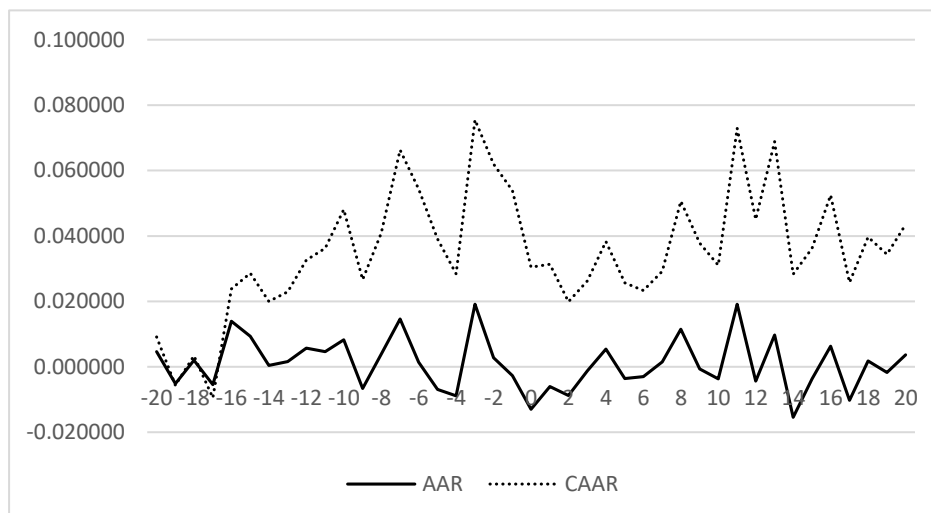
Hypothesis 02: The abnormal return is positive for directors' purchases at CSE.

Hypothesis 03: The abnormal return of is negative for directors' sales at CSE.



Source: Author Compiled

Figure 2: AAR and CAAR of insider purchases from -20th Day to +20th Day



Source: Author Compiled

Figure 3: AAR and CAAR of insider sales from -20th Day to +20th Day

The findings show that the CAAR of insider purchases are positive and significant after the announcement date as hypothesized. Even though CAAR one day prior and after the announcement date of insider sales are negative and significant, the overall CAAR of insider sales over the event window is positive and not consistent with the hypothesis. These results are consistent with Hypothesis 02 that the abnormal return for insider purchases is positive at CSE. As the abnormal return of insider sales is positive, it is not consistent with Hypothesis 03.

Considering the speed of adjusting prices for the insider trading announcement, the CAAR of insider purchases shows an increase the following day after the event announcement. As there is a sudden decrease in CAAR on the second day, there is no consistent positive pattern. According to the graphical presentation of CAAR of insider purchases, even though there is no consistent trend line, it shows a long-term positive pattern over the event window. In consideration of Figure 3, the CAAR of insider sales shows a slight decrease three days before the event day and one day after the event day. Going forward, it follows a sideline trend over the event window.

To consider the results of this study more precisely, CAAR is calculated for different event windows from -20 to +20, and its respective *t*-values are also calculated to determine the significance of these values. CAAR and its *t*-values of insider purchases and sales over different event windows are presented in Table 3 and Table 4, respectively.

Table 3: Insider purchases

Event window	Number of days	CAAR	<i>t</i> -value
W1 = (-20, -1)	20	0.004183	0.293592
W2 = (-10, -1)	10	0.011009	1.092849
W3 = (-1, 0)	2	-0.001730	-0.383983
W4 = (0, 1)	2	0.010895	2.418419 **
W5 = (-1, 1)	3	0.011062	2.004900 **
W6 = (1, 10)	10	0.024024	2.384789 **
W7 = (1, 20)	20	0.042853	3.007951 ***
W8 = (-20, 20)	41	0.045139	2.212902 **

* 0.1 significance level, ** 0.05 significance level, *** 0.01 significance level

Source: Author Compiled

Table 3 presents CAAR of insider purchases and their *t*-values for different event windows. CAAR is positive and significant for insider purchases for the event windows (0, 1), (1, 10) and (1, 20) after the event day. It is interesting to note that the CAAR is negative and not statistically significant for the event window (-1, 0). But CAAR is positive for the event windows (-20, -1) and (-10, -1) before the event day, but those values are not significant. According to this finding, although CAAR showed an early reaction to insider purchases, its

values are not statistically significant. The AAR of insider purchases is negative and not significant on the event day. Still, to the contrary, AAR is positive and significant in the 0.01 significance level on day 1 after the event day (Appendix 01).

Table 4: Insider sales

Event window	Number of days	CAAR	t-value
W1 = (-20, -1)	20	0.038879	1.419592
W2 = (-10, -1)	10	0.003632	0.187533
W3 = (-1, 0)	2	-0.019098	-2.205119 **
W4 = (0, 1)	2	-0.014824	-1.711683 *
W5 = (-1, 1)	3	-0.027857	-2.626273 ***
W6 = (1, 10)	10	0.016468	0.850391
W7 = (1, 20)	20	0.002389	0.087236
W8 = (-20, 20)	41	0.039788	1.014674

* 0.1 significance level, ** 0.05 significance level, *** 0.01 significance level

Source: Author Compiled

CAAR and its *t*-values of insider sales are presented for different event windows from day -20 to day +20. CAAR is negative and significant for insider sales for event windows (-1, 0), (0,1) and (-1,1). But CAAR is positive and not significant for the event windows (1, 10) and (1, 20). Also, CAAR is positive and not significant for event windows (-20, -1) and (-10, -1). The market showed only an immediate response of negative CAAR from day -1 before the event day to day +1 after the event day. Afterward, CAAR is positive but not statistically significant. AAR is negative and significant in the 0.05 significance level on the event day, and AAR remains negative and not significant for three days after the event day (Appendix 02). Also, as there are positive and negative AAR before the event day, AAR did not show any consistent early response to the insider sales.

DISCUSSION

The Efficient Capital Market Hypothesis, developed by Fama in 1970, is ultimately related to the abnormal values of stock characteristics following insider trading in most studies. According to Fama (1970), a market is said to be weak form efficient if it responds to all past data, and semi-strong efficient if it does so in response to all publicly available data. Markets with a strong form react to all information, both public and private. Prices instantly adjust to reflect newly accessible information in a semi-strong market. At the same time, if insiders earn

abnormal share returns, the strong efficient market hypothesis turns out false.

Considering the research by Perera and Nimal (2017), they concluded in their study that there is no consistency, which raises questions about the effectiveness of the CSE in terms of how quickly the information content of directors' trading activity reflects in the share price.

Also, Nanda and Barai (2020) observed an abnormal movement after insider trading and concluded that BSE does not hold the strong-form efficient market hypothesis. Even in the ATHEX, Antoniadis et al. (2015) observed that there is no evidence for the existence of strong or semi-strong market efficiency hypothesis for insider transactions.

According to Fama (1970) Stock price fluctuations must be realistic in size and occur virtually instantly in order to test a semi-strong market. Following the initial adjustment, semi-strong efficiency is degraded if consistent variation in either direction takes place. After an initial adjustment, a semi-strong efficient market shouldn't indicate that further volatility is essential because it should react to fresh information right away (Fama, 1970).

In this study, CAAR of insider purchases and sales showed immediate response with statistical significance around the event window. Considering the insider sales, it gives evidence to semi-strong market efficiency hypothesis since the CAAR in the event windows (-1, 0), (0, 1), and (-1, 1) are -0.019098, -0.014824, and -0.027857 respectively and these values are statistically significance. Since the CAAR prior to and after these event windows are positive and not significant, the semi-strong form market efficiency hypothesis does not weaken.

In consideration with the insider purchases, it shows a negative CAAR prior to the event day and right after the event day positive and statistically significant CAAR is observed. It supports the semi-strong form market efficiency hypothesis. But the positive CAAR continued throughout the event window of twenty-one days with statistically significant t- values. So, according to Fama (1970), the semi-strong form market efficiency for insider purchases at CSE weakened.

Information asymmetry is a discrepancy in the two negotiating parties' awareness of important facts and information. If the insider earns abnormal return after their transaction, the information asymmetry exists in the market. Bajo and Petracci (2004) stated in their study that insider transaction may exist for two reasons. Insiders may change their holdings if they believe that current stock prices are temporarily overvalued or undervalued (information asymmetry hypothesis) or they might exploit some privileged and materialistic information about the company. They back up the notion that an alteration in insider ownership has informational

value and sends a message to the market because of the information gap between insiders and private investors (Bajo & Petracci, 2004).

In this study, since Cumulative average abnormal return of insider purchases is positive and significant for the event windows (0, 1), (-1, 1), (1, 10), and (1, 20), there is evidence to the information asymmetry hypothesis in the market. The positive CAAR during the post announcement date might cause by two reasons: Insider might do their trading based on any undisclosed information which causes information asymmetry in the market, or it might be a bull market packed with active traders. In the time of event window (-1, 0), CAAR is negative for insider purchases. This negative CAAR prior to the announcement day supports the fact stated by Bacon and Roddenberry (2011) that the insiders are tend to “buy low.”

The overall Cumulative average abnormal return for insider sales over the event window of (-20, 20) is positive which is contrary to some literature works. Since these positive abnormal returns for insider sales are confusing, this can be explained in four different ways. First, compared to buying, insider sales are more likely to be motivated by factors besides confidential information (Jeng et al., 2003). Second, when the market is controlled by the buy side, probably because of good press releases, insiders may sell stock. Bacon and Roddenberry (2011) support the fact in their research that insiders tend to “sell high”. Insiders might have some aptitude for market timing. According to Bajo and Petracci (2004) insiders may have a better grasp of the true worth of the company. As the final reason, it's also possible that capturing information asymmetry through CAAR may not be the best approach (Aktas et al., 2008).

As this study is based on a frontier market, it does not completely comply with the already mentioned previous studies. In contrast to the studies by Perera and Nimal (2017), Bajo and Petracci (2004), Aktas et al. (2007) and Antoniadis et al. (2015) this study observed positive Cumulative average abnormal return for all insider transactions as well as for only insider purchases and only insider sales. This result completely complies with the research by Nanda and Barai (2020).

Unlike the research by Bajo and Petracci (2004) based on the Italian stock market, a strong market reaction is found with the statistical significance around the announcement day for insider purchases. Also, for the insider sales, negative Cumulative average abnormal return with statistical significance is observed only around the announcement day. This is followed by positive CAAR throughout the event window.

CONCLUSION AND IMPLICATIONS

This study observed positive Cumulative average abnormal return for all insider transactions as well as for only insider purchases and only insider sales. These results answered the question that the insider trading impacts share returns. Through this, the relationship between insider purchases/sales and share returns is determined as positive.

The findings of this study show a semi-strong form of market efficiency to some extent. Considering the insider sales, CAAR is negative and significant only around the announcement day, but it is positive and not significant before Day -1 and after Day +1. This provides evidence that the market showed an immediate reaction and supports semi-strong efficient market hypothesis. Considering the insider purchase, CAAR is negative and not significant for Day -1, followed by positive and significant CAAR from Day 0 to Day +20. Even though it showed an immediate reaction, it continued throughout the event window. Considering the insider purchases, the semi-strong form of market efficiency weakened.

This study did not show any concrete evidence of information asymmetry in the Sri Lankan stock market. Even though impact of insider trading in share return is found, the positive CAAR for insider purchases and sales may not be necessarily because of information asymmetry in the market.

This study partially agrees with the research done by Perera and Nimal (2017) based on Colombo stock exchange, while it entirely agrees with the research by Nanda and Barai (2020) based on BSE. In the research by Bajo and Petracchi (2004) based on the Italian stockmarket, they found no immediate market reaction around the announcement day. Unlike the Italian market, the data analysis of this study showed an immediate reaction to all the insider transactions. In contrast with the previous literature, the CAAR around the announcement day showed statistical significance which added value to the findings of this study.

The study indicates that an outside investor can earn abnormal return by mimicking the insider purchases. As this study found out immediate reaction to the insider transactions in CSE, it will be helpful for the short-term outside traders in the market to earn an abnormal return. Also, this study creates an awareness on the topic insider trading and contributes to the literatures because this is a rare kind of study to be found in a frontier market like Sri Lanka.

Further, there are several gaps in the existing research that warrant further exploration, especially in the context of Sri Lanka. Studies based on CSE mostly generalize the findings across various sectors. There is a potential gap in understanding whether the impact of insider

trading on share returns varies significantly among different sectors in the Sri Lankan market. Subsequent future researchers may choose to focus their efforts on individual sectors, scrutinizing whether the impact of insider trading on share returns differs significantly across various sectors. Also, it is suggested to widen the event window and consider weekly or monthly returns to capture the market reaction more precisely. While this study is confined to examining share returns, there is room for expansion in future research to encompass additional stock characteristics such as share price and share volume. This broader approach would contribute to a more holistic understanding of the dynamics and implications of insider trading on various dimensions of stock behavior.

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APPENDICES

Appendix 01: AAR and CAAR and its *t*-values of insider purchases for the event window

Event window	AAR	<i>t</i> -values	CAAR	<i>t</i> -values
-20	0.001110	0.348494	0.001110	0.348494
-19	-0.001947	-0.611113	-0.000837	-0.185700
-18	-0.003732	-1.171497	-0.004569	-0.827987
-17	-0.000029	-0.008964	-0.004597	-0.721540
-16	-0.001201	-0.376916	-0.005798	-0.813927
-15	-0.002257	-0.708342	-0.008054	-1.032190
-14	0.003778	1.186027	-0.004276	-0.507346
-13	-0.002696	-0.846178	-0.006972	-0.773748
-12	-0.002142	-0.672403	-0.009114	-0.953631
-11	0.002287	0.717986	-0.006827	-0.677647
-10	-0.001732	-0.543803	-0.008559	-0.810074
-9	0.004984	1.564461	-0.003575	-0.323965
-8	0.003146	0.987633	-0.000429	-0.037336
-7	0.003708	1.163935	0.003279	0.275097
-6	-0.001933	-0.606821	0.001346	0.109088
-5	-0.000204	-0.064088	0.001142	0.089602
-4	0.000916	0.287636	0.002058	0.156689
-3	-0.001434	-0.450116	0.000624	0.046181
-2	0.003392	1.064629	0.004016	0.289192
-1	0.000167	0.052427	0.004183	0.293592
0	-0.001897	-0.595462	0.002286	0.156576
1	0.012792	4.015623***	0.015078	1.009110
2	-0.006183	-1.941041*	0.008895	0.582194
3	0.005929	1.861293*	0.014824	0.949871
4	0.002920	0.916609	0.017744	1.114001
5	-0.002660	-0.834967	0.015084	0.928618
6	0.002149	0.674740	0.017234	1.041113
7	0.000997	0.312929	0.018230	1.081490
8	-0.000659	-0.206996	0.017571	1.024242

9	0.010821	3.396891***	0.028392	1.627211
10	-0.002083	-0.653716	0.026310	1.483340
11	0.004763	1.495172	0.031073	1.724291*
12	-0.001823	-0.572260	0.029250	1.598346
13	0.000318	0.099941	0.029568	1.591805
14	0.000003	0.001089	0.029572	1.569085
15	0.000586	0.183887	0.030158	1.577786
16	0.001461	0.458739	0.031619	1.631735
17	0.000616	0.193327	0.032235	1.641483
18	0.005138	1.612889	0.037373	1.878571*
19	-0.000702	-0.220346	0.036671	1.820101*
20	0.008468	2.658161***	0.045139	2.212902**

* 0.1 significance level, ** 0.05 significance level, *** 0.01 significance level

Appendix 02: AAR and CAAR and its *t*-values of insider sales for the event window

Event window	AAR	<i>t</i>-values	CAAR	<i>t</i>-values
-20	0.004585	0.748704	0.004585	0.748704
-19	-0.005135	-0.838424	-0.000549	-0.063441
-18	0.001945	0.317560	0.001395	0.131544
-17	-0.005440	-0.888315	-0.004045	-0.330237
-16	0.013909	2.271282**	0.009865	0.720375
-15	0.009369	1.529835	0.019233	1.282162
-14	0.000404	0.066040	0.019638	1.212012
-13	0.001625	0.265428	0.021263	1.227576
-12	0.005661	0.924395	0.026924	1.465502
-11	0.004642	0.758037	0.031566	1.630009
-10	0.008266	1.349736	0.039832	1.961114**
-9	-0.006586	-1.075388	0.033246	1.567186
-8	0.003821	0.623889	0.037067	1.678739*
-7	0.014614	2.386319**	0.051681	2.255444**
-6	0.001352	0.220718	0.053033	2.235955**
-5	-0.006957	-1.135973	0.046076	1.880961
-4	-0.008832	-1.442180	0.037244	1.475020

-3	0.019133	3.124336***	0.056377	2.169875**
-2	0.002796	0.456612	0.059174	2.216755**
-1	-0.002677	-0.437150	0.056497	2.062876**
0	-0.013033	-2.128152**	0.043464	1.548760
1	-0.006065	-0.990357	0.037399	1.302007
2	-0.008759	-1.430329	0.028640	0.975144
3	-0.001210	-0.197548	0.027430	0.914288
4	0.005442	0.888620	0.032872	1.073539
5	-0.003608	-0.589099	0.029264	0.937160
6	-0.002979	-0.486511	0.026285	0.826012
7	0.001457	0.237976	0.027742	0.856101
8	0.011455	1.870452*	0.039197	1.188546
9	-0.000704	-0.114884	0.038493	1.147594
10	-0.003703	-0.604748	0.034790	1.020316
11	0.019078	3.115245***	0.053867	1.554950
12	-0.004403	-0.718984	0.049464	1.406050
13	0.009685	1.581539	0.059150	1.656450*
14	-0.015440	-2.521309**	0.043709	1.206436
15	-0.003734	-0.609699	0.039975	1.087946
16	0.006276	1.024890	0.046252	1.241634
17	-0.010233	-1.670934*	0.036019	0.954126
18	0.001831	0.298996	0.037850	0.989692
19	-0.001718	-0.280574	0.036132	0.932880
20	0.003656	0.597036	0.039788	1.014674

* 0.1 significance level, ** 0.05 significance level, *** 0.01 significance level