White-collar crime and stock return: Empirical study from announcement effect

Puah, Chin-Hong and Liew, Samuel Wei-Siew

Faculty of Economics and Business, Universiti Malaysia Sarawak

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White-Collar Crime and Stock Return: Empirical Study from Announcement Effect

Samuel Wei-Siew Liew and Chin-Hong Puah♣
Faculty of Economics and Business, Universiti Malaysia Sarawak,
94300 Kota Samarahan, Sarawak, Malaysia.

Abstract

White-collar crime continues to hit the headlines across Malaysia and it remains a serious issue influencing organizations globally. A share price event study is thus conducted on a group of public listed companies in Malaysia to examine the announcement effect of white-collar crime. The period of the study is from 1996 to 2010, covering both the Asian Financial Crisis in 1997/98 and the sub-prime mortgage crisis in 2008/09. Results indicate the existence of significant negative abnormal share price reaction on 10 trading days subsequent to the day of announcement. It means that the stock market in Malaysia is not efficient. However, it implies that the market possesses the power to discipline unethical companies as the shareholders drive down their value by disposing their stocks following the announcement.

1. Introduction

The term "white-collar crime" has been given many definitions by different criminologists at different times. It has first been popularized in 1939 by Edwin Sutherland, who was both a criminologist and a socialist. He defined the crime as one "committed by a person of respectability and high social status in the course of his occupation" (Sutherland, 1949). Viewed as being too restrictive, Edelhertz, a criminologist too, defined the crime as "an illegal act or series of illegal acts committed by non-physical means and by concealment or guile, to obtain money or property, to avoid the payment or loss of money or property, or to obtain business or personal advantage" (Edelhertz, 1970). Edelhertz's wider definition of the term is preferred for the purpose of this study and it can be used interchangeably with terms like "economic crime", "corporate crime", "business crime", "financial crime", and/or "commercial crime".

In a study carried out by Global Financial Integrity (GFI) (2011), illicit financial flows for the years 2000-2008 from developing countries record an average of US$1.26 trillion outflow annually. The main sources of the illicit money are corruption, kickbacks, tax evasion, and theft of cash. Malaysia is ranked fifth among

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♣ Corresponding author: Chin-Hong Puah, Department of Economics, Faculty of Economics and Business, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia. E-mail: chpuah@feb.unimas.my

all developing countries in the world in terms of the largest cumulative illicit outflows during 2000-2008, recording a total of US$291 billion. Among the developing countries in Asia, Malaysia is ranked second after China (US$2.18 trillion) (GFI, 2011).

In Malaysia, companies like Sime Darby Berhad, Alliance Financial Group Berhad, and Kenmark Industrial Co (M) Berhad had experienced a nose dive in their share prices following the announcement of suspected fraud and abuse of authority. Kenmark, for instance, was wiped out of some Ringgit Malaysia (RM) 100 million in market value over merely a week's time ("What's Going," 2010). Sime Darby, on another instance, lost some RM2 billion in its energy and utilities division in the financial year ended June 30, 2010 ("Sime Darby," 2011). The effect of the press announcement of white-collar crime requires serious attention as the likely adverse effect on the share price of the alleged companies may lead to possible economic damage of investors.

The occurrences of fraud, as surveyed by KPMG (2009), are expected to rise continually for a couple of years. These findings will prove to be harmful to the companies in Malaysia when investors, local or foreign, remain to have little faith towards the country's business ethics. It is imperative, with the increasing number of occurrences, that corporate Malaysia understands whether or not the stockholders will drive down the value of the company's stock when the commitment of crime is made known to them. The existence of such a reaction would mean that the announcement effect of white-collar crime in Malaysia is deterrent in nature. Thus, the main purpose of the research is to investigate and identify the announcement effect of white-collar crime towards the stock performance of the affected companies in Malaysia.

The paper is organized into 5 sections. Section 1 introduces the seriousness of white-collar crime in Malaysia and the rationale behind conducting a share price event study. In the next section, different results of the announcement effect on share returns are examined from the review of past studies in this area. Section 3 then presents the methodology of conducting a share price event study. In Section 4, the findings of the study are discussed and the last section contains the conclusion of the study.

2. Literature Review

The types of white-collar crimes subject to the recent survey conducted by PricewaterhouseCoopers (2009) are asset misappropriation, accounting fraud, bribery and corruption, intellectual property infringement, money laundering, tax fraud, illegal insider trading, market fraud involving cartels colluding to fix prices, espionage, and others. There is no apparent categorization and the list is not exhaustive. Lim (2005) categorized the white-collar crime in Malaysia as criminal misappropriation of property, criminal breach of trust, cheating/fraud, forgery/credit/Automated Teller Machine (ATM) card fraud, counterfeiting currency, defamation, product piracy, product counterfeiting, cyber crime, offences of communications and multimedia industries, offences of printing and publication, banking/financial fraud, loan sharking, securities fraud/listing offences/insider trading, commodities fraud, money laundering, insurance fraud, maritime fraud, offences of company, tax evasion, customs and smuggling offences, immigration and human

trafficking offences, bribery and corruption, exchange control violations, consumer fraud, pollution offences, and occupational offences. No classification is made too.

Gottschalk (2010), however, classified white-collar crime into four main categories only, namely, corruption, fraud, theft, and manipulation. He defined corruption as "the giving, requesting, receiving, or accepting of an improper advantage related to a position, office, or assignment" and its sub-categories are kickbacks, bribery, extortion, and embezzlement. The sub-categories for fraud are identity fraud, mortgage fraud, and occupational fraud; for theft are theft of cash, intellectual property theft, and fraud; and for manipulation are laundering, cyber crime, bid rigging, and insider trading. Such a classification allows researchers and practitioners to organize their thoughts at ease when mapping crime.

The literature on the effect of information releases on share returns is well-established (Hines, McBride & Page, 1999). Feroz, Park and Pastena (1991) discovered a stock market reaction to the announcement of the disputed issue, but not to the announcement of the resolved matter at a much later date. In the study conducted by Hines et al. (1999), the results demonstrate no price reaction to press notices because the Financial Reporting Review Panel (the Panel) did not release any information until the issue was resolved. The results are entirely different if according to the findings of Rao (1997) and Voon, Puah and Entebang (2008) because the information released on the announcement date contains ongoing disputed issues and not issues which have achieved resolution. The share price is found to react negatively to the announcement of white-collar crime on the day of the announcement.

Foster (1986) identified three factors determining whether an announcement has information content, namely (i) the capital market's expectation as to the content and timing of the release; (ii) the implications of the release for the future distribution of security returns; and (iii) the credibility of the information source. The press notice issued by the Panel in Hines et al. (1999) was considered to be highly unexpected because the Panel did not release any information to the public until resolution. The implications of the Panel's release towards the future returns of the security in question were somewhat detrimental as it might reduce the public's faith towards the company. As far as the credibility of the information source is concerned, the Panel is a reputable body established by the government. Therefore, if according to the three factors advocated by Foster (1986), the press notice issued by the Panel should have high information content and caused a change in share prices. However, the findings of the study demonstrate otherwise. There is no evidence of a price reaction on the day of announcement. Such findings can perhaps be attributed to the leakage of information as the Panel does not have any power to stop others from disclosing information before an official notice is issued.

The findings in the studies by Rao (1997) and Voon et al. (2008) are more straightforward in agreement to the three factors identified by Foster (1986). The announcement date of unethical conduct in Rao (1997) is defined as the date when a report is first published in the Wall Street Journal. The date of announcement is highly unexpected to the public and the implications are undoubtedly injurious as it is the first time the public is made known of the conduct in question. In the study by Voon et al. (2008), however, the announcement date is set as the date a company is charged for committing corporate crime according to the information in the Securities

Commission (SC) Malaysia's official website. The announcement date might not be unexpected and the detrimental nature of the implications might have worn off because the news of the unethical conduct had already spread gradually to the public even before the companies were charged. In such circumstances, it is necessary to test not only the significance of average abnormal returns, but also the significance of cumulative abnormal returns (Jong, 2007).

It is worthwhile to note that Rao (1997), Hines et al. (1999) and Voon et al. (2008) shared a common limitation. There are relatively few organizations which have been subject to the research due to data availability. Since the data points for testing market reaction are few, the accuracy of the results may be undermined. Future research relating to the announcement effect of white-collar crime should include more companies to achieve a more accurate result.

3. DATA AND METHODOLOGY

Companies involved in the share price event study are or were listed publicly in Bursa Malaysia. The companies have been suspected of committing white-collar crime. The event refers to the day the alleged company is charged with committing white-collar crime. The companies and their respective announcement dates are obtained from the official website of SC Malaysia. The period of study is set to be 1996 to 2010. The event window in this study is extended from the typical 30 days before and after the event (Teall, 2007) to 40 days before and 30 days after the event to fully capture the effects of the event of interest. Ideally, the announcement date should be defined as the day the media makes known the suspicion of the occurrence of white-collar crime in a public listed company to the public to allow first-hand examination of the share price reaction. Regrettably, the limitation of the availability of data makes such examination almost impossible.

The impact of the event study is represented by the abnormal return of the share price due to the event. In other words, the abnormal return is the difference between the stock's actual return and the stock's expected return in the absence of the event. Many researchers have used a single-index model to estimate abnormal return (Bodie, Kane & Marcus, 2009), which is expressed mathematically as Equation (1):

$$r_t = a + br_{Mt} + e_t \tag{1}$$

where
  r_t stock return during a given period t;
  a the average rate of return the stock would realize in a period t with a zero market return;
  b the sensitivity to the market return;
  r_{Mt} the market's rate of return during a given period t; and
 e_t the part of a security's return resulting from firm-specific events.

The residual, e_t, is the measure of the abnormal performance of stock. It is the stock's return below "what one would predict based on broad market movements in that period, given the stock's sensitivity to the market" (Bodie et al., 2009). If $e_t<0$, then

the actual return, r_t, is less than the estimated return, $a + br_{Mt}$. Rewriting Equation (1) interprets the definition even clearer, as shown in Equation (2):

$$e_t = r_t - (a + br_{Mt}) \tag{2}$$

Estimating the regression parameters in Equation (1) (the intercept a and slope b) is the next task. The estimation must be careful and proper. The data used for estimation has to be sufficiently separated in time from the event in question so that the parameters are not affected by event-period abnormal stock performance. Following Dyckman, Philbrick, and Stephan (1984), and Shaheen (2006), the holding period returns (HPRs) of each stock are calculated on a daily basis for 120 days prior to the event date to formulate a benchmark for normal returns. In the studies by Brown and Warner (1985), and Delaney and Wamuziri (2004), however, the number of days prior to the event date is bigger, which are 244 days and 240 days, respectively. As far as the parameter estimation period is concerned, many researchers advocate that slope b, or beta, is more stable when the horizon of the estimation period is longer (Ray, 2010). As such, a maximum of 271 daily return observations, starting at day -240 and ending at day +30, is collected for the study (see Figure 1). The 200 earliest observations are then used to estimate the regression parameters a and slope b for each individual security.

Figure 1: Illustration of the Event Study Window
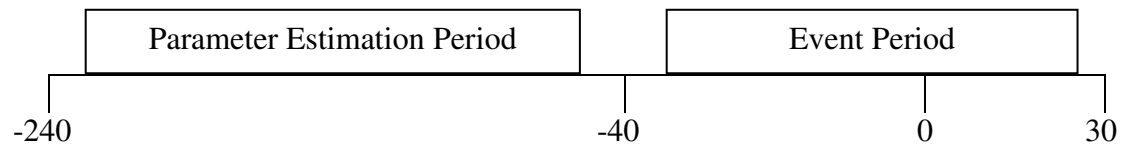
The estimated parameters and the actual returns of each security are then substituted into Equation (2) to calculate the residual, e_t, or the abnormal returns (ARs). The ARs can be analyzed separately for each security, but this may not be very informative as "a lot of stock price movements are caused by information unrelated to the event under study" (Jong, 2007). Therefore, the average abnormal returns (AARs) over the sample companies, N, at each trading day must be considered using the following Equation (3):

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it} \tag{3}$$

On average, the information unrelated to the event is cancelled out because the abnormal returns are all centered surrounding the event in question and the effect of the event should be reflected on average (Jong, 2007).

The computation of AAR is not sufficient in this study as the date the public is first made known of the allegedly unethical company cannot be ascertained exactly due to the question of data availability. Most studies [1] often take this into account by summing all the ARs over the time period of interest to find the cumulative abnormal returns (CARs). The CAR is a better indicator of the total impact of information

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[1] See for example, Jong (2007); Khotari and Warner (2006); Rao (1997); Shaheen (2006); and Voon et al. (2008).

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release (Bodie et al., 2009). Again, in event studies, the average of *CAR*s is considered over the sample companies, *N*, at each trading day. The average of *CAR*s is known as the cumulative average abnormal return (*CAAR*) and it can be calculated using the following Equation (4):

$$CAAR = \sum_{t=t_1}^{t_2} AAR_t \tag{4}$$

Subsequently, the *AAR*s and *CAAR*s have to be tested on their statistical significance. The null hypothesis that there is no negative abnormal return is to be tested using a simple *t*-test. The null hypothesis is as follows:

$$H_0: E(AR_{it}) \geq 0 \tag{5}$$

The simple *t*-test for *AAR*s is the ratio of AAR_t to its estimated standard deviation, $\hat{\sigma}(AAR_t)$. The standard deviation has to be estimated from the time series of *AAR*s in the parameter estimation period to ensure its stability and reliability. The *t*-test for *AAR*s is as follows:

$$t(AAR_t) = \frac{AAR_t}{\hat{\sigma}(AAR_t)} \tag{6}$$

For the *CAAR* shown in Equation (4), the test statistic is simply:

$$t(CAAR) = \frac{CAAR(t_1,t_2)}{\hat{\sigma}(t_1,t_2)} \tag{7}$$

where

$$\hat{\sigma}(t_1,t_2) = \sqrt{l}\ \hat{\sigma}(AAR_t) \tag{8}$$

The estimation of standard deviation for *CAAR* is applied in many studies (Khotari & Warner, 2006; Rao, 1997; Shaheen, 2006; Voon et al., 2008). *l* is the horizon length of the event period which can be calculated from $t_2 - t_1 + 1$. In this study, the *l* is 71 trading days.

In view of the small number of sample companies (*N*=14) and the nature of the null hypothesis, the critical value for the *t*-test has to be taken from the *t*-distribution table under one tail probabilities (Teall, 2007). It must also be noted that, in the estimation of $\hat{\sigma}(AAR_t)$, the degree of freedom, *N*-1, is taken into account to eliminate the bias of taking deviations from the sample arithmetic average, AAR_t, instead of the unknown, true expected value, $E(AAR_t)$ (Bodie et al., 2009). Once the critical value has been determined at 5% level of significance, if *t* is less than the critical value, the null hypothesis of no negative abnormal return is rejected, and vice versa. The critical value is -1.771 at 5% level of significance.

4. RESULT DISCUSSION

The initial search of companies from 1996 to 2010 via the SC's official website returns a total of 38 announcements from a total of 34 companies. During the filtering process, 4 companies have been found or suspected of committing white-collar crime

on two occasions within the time window of study. Apart from the reason of data availability, a handful of the companies have been suspended from trading in the market. As such, it is not possible to include these companies in the share price event study. As shown in Table 1, the final sample contains 14 announcement dates on white-collar crime from 14 target companies.

Table 1: Final Sample of Target Companies with their Announcement Dates

	Target Company	Announcement Date
1	Kim Hin Industry	20 November 1996
2	Repco Holdings	29 November 1996
3	Seal Incorporated	05 January 2001
4	Pilecon Engineering	08 February 2001
5	Chase Perdana	16 March 2001
6	Idris Hydraulic	28 June 2002
7	Fountain View	27 June 2005
8	NasionCom Holdings	28 May 2007
9	Transmile Group	12 July 2007
10	Multi-Code Electronics	13 March 2009
11	Mems Technology	16 April 2009
12	United U-Li Corporation	28 April 2009
13	LFE Corporation	24 June 2010
14	Inix Technologies	23 September 2010

Source: SC (2011).

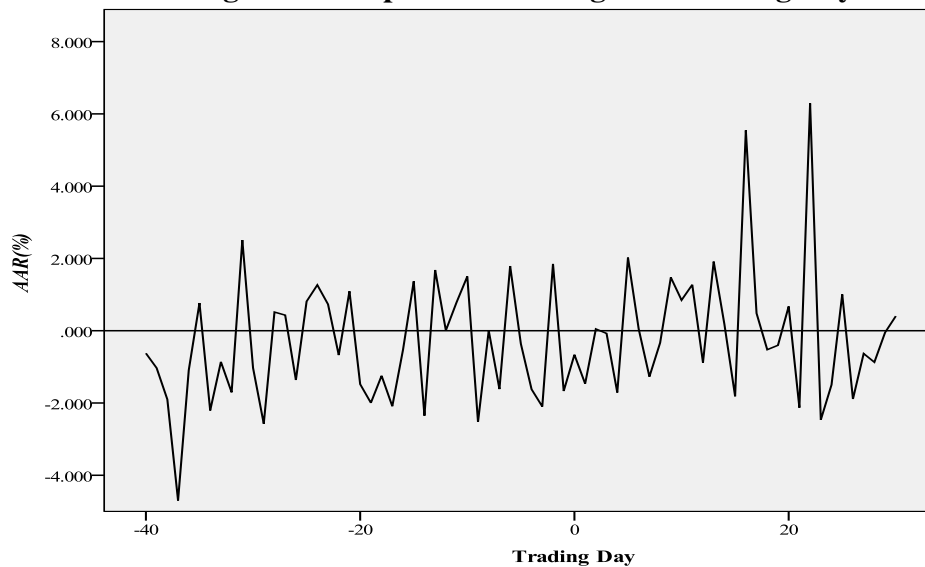**Figure 2: Graph of *AAR* % against Trading Day**

Figure 2 sets out a graph of percentage *AAR*s on the y-axis against the trading day on the x-axis. The announcement date is indicated by 0 on the x-axis. Before any inspection of the graph, it is important to note that *AAR*s must be less than 0 to indicate abnormal performance in relation to the announcement of white-collar crime as they show that the "stock prices decreased more than expected" (Rao, 1997; Voon et al., 2008).

Upon inspection of the graph, the *AAR* on the day of the announcement is very close to 0 and it is recorded to be -0.664% (see Table 2). The fact that the *AAR*s surrounding the day of information release are close to 0 implies no significant

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abnormal performance in relation to the announcement of white-collar crime. The statistical test for significance also confirms the findings as the t-values are not significant at all (see Table 2). Therefore, in terms of AARs, the null hypothesis that there is no negative abnormal return (H$_0$: $E(AR_{it}) \geq 0$) cannot be rejected.

Table 2: AARs% and $CAAR$s% with their Respective t-values

Trading Day Relative to Announcement Date	AAR%	t-values for AAR%	CAAR%	t-values for CAAR%
0	**-0.664**	**-0.427**	**-22.895**	**-1.749**
1	-1.466	-0.944	-24.361	-1.861**
2	0.049	0.031	-24.312	-1.857**
3	-0.075	-0.048	-24.387	-1.863**
4	-1.709	-1.100	-26.096	-1.993**
5	2.023	1.302	-24.073	-1.839**
6	0.047	0.030	-24.026	-1.835**
7	-1.271	-0.818	-25.297	-1.932**
8	-0.334	-0.215	-25.631	-1.958**
9	1.473	0.948	-24.158	-1.845**
10	0.847	0.545	-23.311	-1.781**

Note: Asterisks (**) denote significant at 5% level.

Figure 3 shows the graph of percentage $CAAR$s on the y-axis against the trading day on the x-axis. Inspection of the graph clearly depicts the gradual decrease in $CAAR$s from Day -40 to a few days after $t=0$. To be exact, the day the $CAAR$s hit the lowest point is on Day 4 (see Table 2), after which the $CAAR$s start to increase steadily. The dramatic decrease after the announcement day reflects significant abnormal returns on the subsequent days. The statistical test also confirms the visual inspection of the graph. As shown in Table 2, all the $CAAR$s from Day 1 to 10 are significant at 5% level. As a result, one can reject the null hypothesis and conclude that there is negative abnormal return following the announcement of white-collar crime.

Figure 3: Graph of $CAAR$ % against Trading Day
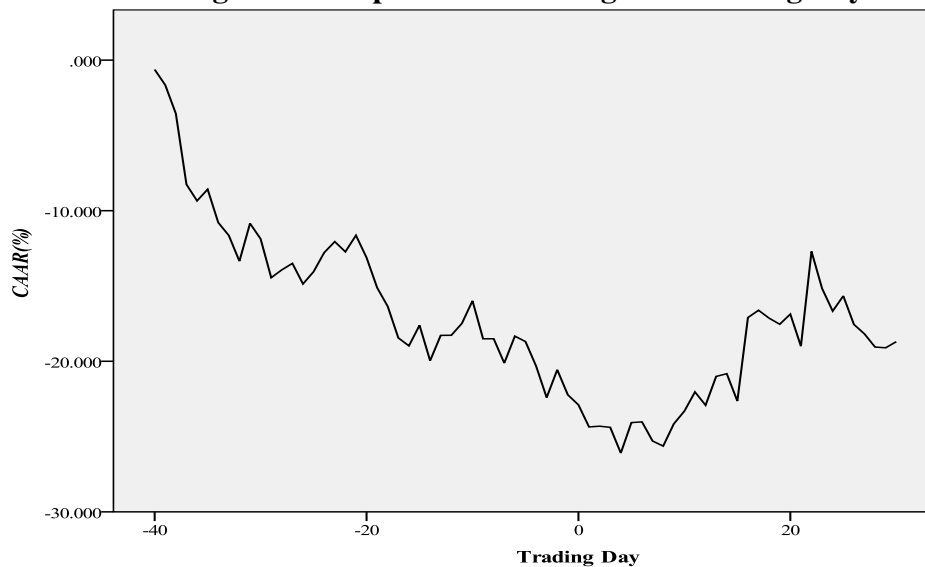
The difference in outcome of the two graphs arises from "leakage of information". Here, the leakage refers to the period of time when the public is made known of the unethical companies until the day the companies are officially charged in court. During the leakage, the stock price has started to decrease weeks before the day the companies are charged. The *AAR* on the announcement day is, thus, a poor indicator of the total impact of the information release. The *CAAR*s, however, capture the total stock movement for the entire period and reflect the impact of the information release on the announcement day or, in this case, the subsequent days.

5. CONCLUSION

The investigation of the announcement effect of white-collar crime in Malaysia, using share price event study, concludes that share price reacts negatively following the announcement. Significant negative *CAAR*s are found continuously in the subsequent 10 trading days, which equates to a period of two weeks. The findings indicate that most of the announcements are indeed news and contain information to the market and that the information has not been completely reflected in the share prices.

Results of the investigation are consistent to those found in Feroz et al. (1991), Rao (1998) and Voon et al. (2008), but they differ from the results found in Hines et al. (1999). The outcome is not at all surprising as the former deals with ongoing disputed issues and the latter with resolved matters. The announcements in this research are announcements of ongoing disputed issues as the dates are set to be the day the companies are charged or prosecuted. For this reason, the results demonstrate evidence of negative price reaction throughout the days subsequent to the day of announcement.

Upon a more detailed inspection, the announcement effect of this research is slightly different than that in Rao (1998). In the study conducted by Rao (1998), significant abnormal performance is found on the day of announcement and none is found on subsequent days. In contrast, it is discovered in this study that there is no evidence of share price reaction on the day of announcement, but on the subsequent days.

The distinction can perhaps be explained by the nature of the market in which the respective study is carried out. "Emerging markets that are less intensively analyzed than US markets and in which accounting disclosure requirements are less rigorous may be less efficient than US markets" (Bodie et al., 2009). The event studies conducted by Rao (1998) and in this research are based in markets that are not efficient. If the market is efficient, significant negative abnormal return would not be discovered on the day of announcement or subsequently because the share prices would react almost spontaneously to the announcement. The distinction, therefore, lies in the degree of efficiency. It may indicate that the market in which the study carried out by Rao (1998) is more efficient because the share prices react more immediately in response to the bad news. As a result, there is no evidence of significant abnormal performance following the day of announcement in Rao (1998). Rao (1998) gathered his/her data in US markets.

Markets that are less efficient have their implications. According to Bodie et al. (2009), "the sluggish response of stock prices to fundamental supply-and-demand

factors is the key to successful technical analysis". Apart from predicting patterns in share prices, more importantly, Malaysia market may have the power to discipline unethical companies. The fact that significant negative *CAAR*s are found for 10 continuous trading days imply that shareholders do react significantly to the announcement of white-collar crime. They are worried that the company may be suspended from trading and can never recover from the incident. Consequently, the shareholders will drive down the company's equity value by disposing their shares immediately after the news is made known to them. However, the question remains how strong the deterrence effect of announcement is in Malaysia. Future studies can investigate whether or not market discipline is efficient in deterring companies from committing white-collar crime in Malaysia.

In the process of conducting the research, one of the limitations is concerned with the determination of the announcement date is not an ideal one. The question of data availability does not permit the day of announcement to be set as the day the public is made known of the alleged unethical behavior of a company. Otherwise, returns from the share price event study can be more informative and representative of the announcement effect of white-collar crime in Malaysia.

The other limitation is that the number of target companies may be too small for the results of event study to be representative of the market reaction in Malaysia. 14 public companies are far from sufficient to capture the true effect of the announcement of white-collar crime. Future studies, therefore, should strive to gather more companies to compensate the lacking in this study. The question of data availability must also be taken into consideration in this matter.

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