Corporate Crime Announcement Effect on Stock Price and Its Determinants in Malaysia

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Abstract: - Nowadays, the increasing cases of crimes committed by corporations have posed challenges to enforcement agencies, especially in Malaysia. It may result in serious damage to financial institutions and economic performance, as well as generate social disorganisation and lower the level of confidence between investors and consumers. This study aims to examine the reactions of corporate crime announcements on stock prices and identify relationships among determinants of stock prices such as firm size, price to book value, earnings per share, and dividends per share in the context of firms involving crime. The sample consists of 11 announcements by 9 publicly listed companies charged by the Securities Commission for committing a corporate crime from 2003 to 2020, with a total observation of 162. The market model event study and fixed effect regression analysis are employed to analyze the data obtained from Yahoo Finance and Bursa Malaysia. The finding indicates that the AARs on the announcement date are not significant at the 5% level. However, the CAARs on the announcement date were negative abnormal returns and statistically significant. This reveals that the stock market is not reacting efficiently to the announcement of corporate crime because the stock price was not fully reflected in all publicly available information. Furthermore, the results of the fixed effect model revealed that firm size and dividend per share have a significant effect on stock price, whereas price-to-book value and earnings per share have insignificant relationships with stock price in the context of firms involved in corporate crime. This study intends to provide a better understanding of the causes of corporate crime and prevent corporate crime from becoming widespread in the country, thereby reducing the number of corporations that participate in crime.

Key-Words: - Corporate crime, Announcement, Stock price, Malaysia, Event study, Fixed effect.

1 Introduction

In Malaysia, corporate crime is not new, and the rate is on an upward trend based on the cases reported each year. Based on the KPMG Malaysia Fraud Survey 2005, their organizations have experienced an increase of 33% of respondents suffering fraud relative to the survey in 2002, [1]. In Malaysia, white-collar crime has caused losses of more than RM3.93 billion from the year 1999 until 2002, with approximately 6,000 cases being reported yearly, [2]. Besides, Malaysia reported RM579 million engaged in 11,714 white-collar crime cases in 2003, [3]. There were fewer cases (9,899 cases) recorded in 2004, however, the total loss increased to RM836.29 million. In addition, Global Financial Integrity reported that around $946.7 billion was recorded in developing countries' illegal financial flows in 2011, compared to $832.4 billion in 2010, [4]. With illicit outflows of $370.38 billion, Malaysia ranked fourth among all developing countries in terms of the highest cumulative illicit financial outflows over the period 2002-2011. In addition, anecdotal evidence shows a whopping RM1.775 billion was lost in 2013 in Malaysia by scams, embezzlement, illegal breach of confidence, and other white-collar crimes, [5].

Malaysian companies like Sime Darby Berhad, Alliance Financial Group Berhad, and Kenmark Industrial Co (M) Berhad experienced a decline in

stock prices due to the announcement of suspected fraud and abuse of authority, [6]. For instance, Kenmark lost about RM100 million in market value in just a week, whereas Sime Darby lost almost RM2 billion in its energy and utility segment in 2010. Apart from that, the Corruption Perceptions Index (CPI) of Malaysia in 2017 was ranked 62 (score of 47) among 180 countries. Corporate fraud has demonstrated a strong correlation with poor corporate governance among fraud, corruption, and bribery.

This is due to those unresolved cases like 1MDB, Sabah Water Development, Felda Global Ventures Holdings Bhd scandal, and PKR vice president Rafizi Ramli's conviction for whistleblowing, which had a huge influence on the CPI ranking in 2017, [7]. Corrupt behaviour creates an unfavourable market climate that encourages anti-competitive behaviour, reduces income, and allows organized crime to thrive. It violates the rule of law, weakens trust in democratic institutions, and threatens democracy's values. Thus, corporate crime is indicated as the most important challenge to the economic development of a nation, [8].

There have been some important developments concerning governance-enhancing initiatives in Malaysia, [9]. The Malaysia Institute of Accountants (MIA) set up a Practice Review Committee in 2002 to enhance the performance of the audit committee's practice. In 2010, the Securities Commission created the Audit Oversight Board, which supervises public interest organizations' auditors and protects investors' interests by encouraging confidence in audited financial statements' accuracy and reliability. However, Malaysia does not seem to be able to eliminate cases of fraud and facilitate whistleblowing despite all such efforts. Many cases have been investigated by the Securities Commission, ranging from the submission of false and misleading documents, the use of defrauding schemes, and the participation in defrauding and short-selling actions, [9].

Furthermore, the Global Crime Report 2009 also found that economic crime has risen despite the recent economic crisis due to incentives or stresses (68%), opportunity (18%), and attitude (14%). Besides, asset misappropriation, accounting fraud, bribery, and corruption were the three most prevalent forms of economic offenses encountered during the economic crisis, [10]. This indicates that corporate crime cases in Malaysia have shown a growing trend. However, information about corporate crime activities significantly affects the performance of the stock market, especially the stock price. When the corporate crime announcement is published to the public, the company will lose the confidence of its investors, which will lead to a decline in firm performance.

2 Problem Formulation

2.1 Theoretical Framework
Past studies provide a better understanding of the effects of corporate crime announcements on stock price reactions and the determinants of stock prices. Consequently, it guided the ideas and results that were developed in prior studies. The main underlying theories in past studies are the Efficiency Market Hypothesis (EMH), Behavioral Finance, and Fama French Model. These theories consider the efficiency of information transfers in the market and the associated stock price movements.

The Efficient Market Hypothesis (EMH) is a hypothesis that states that all information reflects the share price at which it is possible to generate consistent Alpha, [11]. According to the EMH theory, stocks are still trading at their fair value on exchanges, making it difficult for investors to purchase undervalued equities or sell overvalued stocks. As a result, selecting stocks or market timing to outperform the entire market is unlikely, and the only way an investor may earn a greater return is to acquire riskier investments.

The EMH establishes that markets are efficient when analyzing data and achieving equilibrium security rates, [12].

Most studies find that stock prices reflect information about the actual value of the underlying asset that is publicly accessible. If managers are truly owners' agents, increasing shareholder wealth is a good measure to analyze managerial behavior (shareholders). Meanwhile, negative returns from the stock market should discourage managers from engaging in unethical behaviour.

Behavioral finance is the study of psychology's effects on investors' or financial analysts' actions. It covers cognitive psychology, which refers to how people think and most of the literature on this broad psychology has been documented. This theory also assumes that the markets can make unbiased predictions but not predict the future, whereas the financial markets with the consideration of some

situations are assumed to be informationally inefficient in behavioural finance, [13]. Besides, some authors in, [14], found that investors with particular personality traits are the marginal price setters for securities with particular traits. The availability heuristic, the disposition effect, overreaction, and overconfidence are the main phenomena utilized in behavioural finance to explain the financial markets. The personality and psychological factors of investors will lead them to make different investment decisions and react in their own distinct and preferred manner when dealing with bad news announcements regarding the firm they have invested their money in.

The Fama French Model is an asset pricing model that applies to the Capital Asset Pricing Model (CAPM) by adding to the business risk factor of the CAPM size risk and value risk factors. This model is the result of a historical stock price econometric regression. The fact that value and small-cap inventories outperform stocks regularly takes this model into account. By adding these two variables, the model adapts to this outperforming trend, which is thought to make it a better tool for assessing the outcomes of managers. Fama and French emphasized that the additional short-term uncertainty and occasional undervaluation that may arise over a short time period must be resolved by investors. Outperformance is usually clarified in favour of market efficiency by the excess risk that value and small-cap stocks face as a result of their higher capital costs and higher business risk. In order to help the market inefficient, outperformance is clarified by the incorrect pricing of the value of these firms by market participants, which, in the long run, offers an excess return when the value changes, [15].

2.2 Corporate Crime Announcement Effect on Stock Price Reaction

There is a broad and well-known literature on the effect of information releases on stock market returns. For that matter, there is consensus that event study methodology is useful to analyze the effect of an announcement on returns. In past studies, the standard event study methodology was applied, [12]. He examined 16 public and multinational companies that were involved in bribery, scandals, white-collar crime, and illegal payments in the US from 1989 to 1993. The results found that lower expected market-adjusted returns were the actual stock performance for those businesses. In addition, on the day of the white-collar crime announcement, the stock values of the firms decreased by -5.72%. In contrast, the author in, [16], found that the predicted adjusted market returns were lower than the actual stock performance of the Indian companies listed. In addition, the company's stock price increased by 1.42%, and abnormal returns and surrounding days on the announcement day of the right issue by those companies were statistically significant.

Furthermore, a study was carried out on market reaction to corporate news on 6,500 U.S. companies trading publicly on NASDAQ, NYSE, and AMEX between April 2006 and August 2009, [17]. The periods before and after the financial crisis are separately studied to observe that the response to certain types of news has changed. By using event study methodology, they found return volatility typically increases and liquidity decreases in the month after the announcement. During the crisis period, news signalling higher and more stable future cash flows, such as corporate restructuring announcements, new corporate partners, successful research completion, FDA approvals, and legal settlements, contribute to more positive price reactions. Besides, events that are perceived to reduce future cash flows and increase their uncertainty have a more negative impact on stock prices, such as announcements of legal problems, FDA rejections, and unsuccessful research attempts.

In South Korea, some authors, [18], examine the effect of crime type (white-collar crime vs. street crime, operational vs. financial) on the relationship between corporate crime announcements and stock market reaction. A sample of 832 announcements of South Korean companies from the years 2001 to 2010 is examined. They find that there is a negative reaction to stock prices around the announcements of corporate crimes, but that there is no significant difference in reactions between announcements of individual and organizational crimes. Besides, individual white-collar crimes have a greater negative effect on stock prices than the average for individual street crimes, while financial crimes have a significantly greater negative impact than operational crimes in organizations.

Besides, some authors in, [19], studied the impact of corporate crime announcements on the performance of companies in Malaysia. They concluded that the stock market did not respond effectively to the announcement of corporate crime. The outcome is the same as with authors in, [6], in

which Malaysia's stock market was found to be inefficient due to the negative reaction of the stock price to the white-collar crime announcement effect on the subsequent 10 trading days after the date of the announcement. The study in, [20], also found a negative abnormal return to the announcement effect of white-collar crime among Malaysian public listed companies during the period of 1996-2013. The market is not responding effectively to the disclosed information concerning the incidence of white-collar crime in Malaysia.

Apart from that, some authors in, [21], investigate stock market reactions to the news from 2003-2016 about corporate tax avoidance and evasion in Germany. They concluded that the tax evasion news had a negative abnormal return, although there was no general effect on the tax avoidance news. When the tax risk of businesses is low, however, they find positive stock price reactions to legal tax planning.

In addition, some authors in, [22], examined changes in the level of information asymmetry and corporate fraud of companies in the emerging market of Malaysia from 2000 to 2016. The results indicate that the asymmetry of information increases when fraud is discovered by using event analysis, OLS regression, and simultaneous equation models. Subsamples classified by the type of regulation and the type of misconduct were also analyzed in the study. However, there is no proof of a difference in the asymmetry of information between these classes. Overall, the results strengthen the reputational perception that fraud hurts the credibility of corporations and increases the stock market's volatility.

Moreover, some authors in, [23], investigate the response of Indian banks' stock prices to the announcement of fraud. By using the event study methodology, the findings indicate that fraud announcements affect the stock prices of banks experiencing fraud. The study found significant abnormal losses in most cases of fraud under consideration, further confirmed by the results of the abnormal volume ratio. The highest abnormal loss is found in the Punjab National Bank stock price (8.74%) which includes the Nirav Modi fraud. The confidence of the investors is adversely affected by increased fraud in the banking sector, which can further lead to implications for the banks concerned.

2.3 Determinants of Stock Prices

Several studies have been carried out by previous researchers on the determinants of stock price reaction. The author in, [24], introduced the share price determinants for the US market and defined dividends, net profit, operating earnings, and book value as significant factors influencing the price of shares in the US. By using the multiple correlation method in 1954 and the year 1955, the correlation of other determinants with stock prices in 1954 was closer than in 1955, except for net profits. The coefficient of the dividend rate with the price is 0.9257, which is the highest and the most significant and reliable single price-setter in that year. Meanwhile, with a coefficient as low as 0.7624, net profit is less significant in 1955.

In India, some authors in, [25], used panel data and evaluated three sectors, namely automobiles, healthcare, and public sector undertakings over the period 2000-2009 to deduce the main factors affecting share prices. They examined the effects of dividend, profitability, price-earnings ratio, and leverage on share prices using the panel cointegration test and fully modified least squares. The empirical findings showed that the share prices of all three sectors were positively influenced by the dividend per share and price-earnings ratio. The results also showed that the debt-equity ratio is negative and a major factor influencing share prices. Meanwhile, profitability was found to affect share prices only in the automobile sector.

Moreover, some authors in, [26], have identified the Indian stock market determinants. Panel data is used for thirty BSE SENSEX companies over the period 2010 to 2014 by the fully modified OLS method. The research indicates four determinants of Indian stock market share prices, which are leverage variables, price-earnings ratio, profitability, and DPS. They found that price-earnings ratio, DPS, and profitability have a positive association with stock prices, while leverage has an inverse relationship with stock prices. The inverse relationship between leverage and share prices indicates that debt-to-capital raising requires periodic interest payments on behalf of the company. Besides, the increase of companies using debt will lead to higher interest payments and thus lower earnings for equity shareholders. Thus, investors typically prefer companies with lower debt.

Furthermore, the factors influencing banks' stock market prices in Nigeria in 2012 and 2013 were investigated in the study, [27]. Using the

linear regression model and partial correlation, the four variables that influence stock market prices are net asset per share, price-earnings ratio, price-book value ratio, and dividend per share. The study shows that in both years, net asset value per share and price-book value ratio have a substantial effect on the price of the stock market. However, the dividend per share and the price-to-earnings ratio are relevant factors for 2013, but not major factors for 2012. In addition, the analysis also found that there is a positive correlation between the stock price, net asset value per share, the PBV ratio, and DPS, but that the price-earnings ratio is weakly positive.

Some authors in, [28], use a panel data collection of 41 companies listed on the Bahrain stock exchange for the period 2006 to 2010 to evaluate the factors influencing the share price. They identify eight factors, namely return on equity (ROE), the book value of the share (BVS), earnings per share (EPS), dividend per share (DPS), price-earnings (PE), dividend yield (DY), debt to the total asset (DA) and firm size (LogMCAP). The empirical results show that ROE, BVS, DPS, PE, and Log MCAP have a positive and significant relationship with MPS. However, a negative dividend yield-MPS relationship. This implies that to gain various buyers, dividend decisions are made. Consistencies in measurements have been observed in both models of estimation. Therefore, any group that expects short-term and regular returns will show its effect as a positive relationship with the share price, while the group that is unaffected by dividends will reflect a negative relationship with the stock price.

In addition, some authors in, [29], analyze the effects of the debt-to-equity ratio (DER), earnings per share (EPS), price-to-book value (PBV), and return on equity (ROE) on the stock prices of listed manufacturing companies on the Indonesian Stock Exchange in the food and beverage sub-sector of the consumer goods sector. The financial data for the period 2012–2018 is included in the research data. By using panel data regression, the variables that influence stock prices based on the Random Effect Model are earnings per share and price to book value. EPS and PBV can be explained by the 91.19% variability of the stock prices of manufacturing firms in the food and beverage consumer goods sector, as shown by the value of R-squared.

Apart from that, the authors in, [30], investigated the determinants of the stock price

reaction to allegations of corporate misconduct from January 1982 to December 1996 in the US. In this study, they focus on earnings, risks, and firm size effects. They found that allegations of misconduct are followed by statistically significant modified control-firm reductions in reported earnings, rises in the variability of stock returns, and a decrease in concordance among the earnings estimates of analysts. The magnitude of market-imposed penalties accompanying allegations is systematically related to the type of misconduct, firm size, and the rise in uncertainty. However, the statistical link between the adjustments in earnings around the allegations and the effects of criminal allegations on wealth is still uncertain.

2.3.1 Firm Size and Stock Price

The magnitude of a negative impact on shareholder returns caused by alleged corporate misconduct is inversely related to firm size. A systematic influence of firm size on the wealth effects associated with announced allegations can be described in two methods, [30]. First, a simple economy of scale argument: if criminal conduct has fixed costs in terms of legal fees, fines, and loss of goodwill, the percentage of wealth will be smaller, and the company's capitalization will become higher. Besides, firm size may have an impact on its relationship with corporate "reputation" or the "value of brand-name capital" accumulated by the company being accused. Firms with more reputational capital have more to lose from a loss of reputation, but they are also in a better position to counteract the reputational damage caused by an allegation. In addition, some authors in, [31], analyze the influence of formal corporate indictments on shareholder returns over the 1980s decade to assess the extent of market-imposed consequences of corporate criminality. They find that the 83 companies they look at have a two-day average abnormal return of -1.9%. They find that only company size and a period dummy variable, as an indicator of changes in market attitudes about illegal business activity, are weakly significant in explaining the negative stock price reaction. The potential fine initially stated by the prosecution does not appear to be significant in explaining the loss of shareholder wealth. The statistical link between the size of the corporation and changes in shareholder wealth as a result of the announced allegation might be examined to test these contrasting theories.

2.3.2 Price to Book Value and Stock Price

The reputational implications of criminal allegations may be tied to the extent to which corporate value depends on future growth potential, [30]. Intuitively, one would expect reputational damage to be greater (even among large organizations) for firms with a relatively high percentage of value dependent on growth potential. This is because a large part of these companies' value is reliant on launching new items or entering new markets where they have not yet built up a base of goodwill, or "track record", among consumers and suppliers, [30]. The lack of goodwill will exacerbate the negative effect of allegations of misconduct. Price to book value is significantly linked to future equity value forecasting, [32]. Besides, the author in, [33], provides a methodology for forecasting the impact of price-to-book value in stock price prediction. According to his findings, price-to-book value shows a positive relationship with future stock returns for the companies studied. As mentioned, increasing the worth of a company is a success if it is performed with the aspiration of its owners, because as the firm's value rises, then the owners' wealth also increases, [34]. This indicated that a high corporate value signifies a high level of shareholder wealth. The greater the PBV value, the higher the investor's assessment of the company's shares, causing the stock market price to rise and the capital return to increase. Thus, higher PBV value firms are expected to suffer greater shareholder wealth losses in the criminal allegations.

2.3.3 Earnings per Share and Stock Price

Earnings per share are the common indicator of a company's performance and provide investors with information about a company's value, [35]. Managers have some flexibility in evaluating earnings while complying with general accounting rules. For instance, firms can modify reported earnings by speeding revenue recognition and postponing expense recognition. This effectively shifts earnings from a previous period to the present quarter. Firms can also change earnings by altering inventory accounting methods, updating projected amounts such as bad debt expenses, or employing a range of other tactics. It is feasible that companies will employ discretionary accounting to manage earnings statements around particular corporate events. However, some authors in, [36], find small evidence of a fall in reported earnings following the allegations, but no indication of a relationship between earnings changes and the degree of the stock price response to the allegations. While financial theory would suggest that loss of goodwill or reputational loss is just a reflection of shareholders' expectations for future decreases in earnings or cash flows to the company, no significant link has been discovered between various allegations and changes in corporate earnings. On the other hand, the authors in, [37], discover evidence of earnings manipulation by companies that violate debt covenants. Results management behavior seems especially probable around the time of new stock offerings, given the well-established relationship between earnings and stock prices. This is because a company's most recent earnings are likely to have an impact on its capital costs. Thus, announcing fraud could reveal the manager's negative news on the company's future earnings.

2.3.4 Dividends per Share and Stock Price

From the standpoint of agency theory, declaring a dividend may be considered a manner of resolving the agency problem because outsiders prefer current dividends to held earnings. If the dividend is not paid out in cash, insiders will have the option of using the money for personal gain or investing it in a non-profit initiative for the benefit of the insider, [38], [39]. Managers with free cash flow may enhance dividends that would otherwise be spent on low-return initiatives or wasted, regarding Free Cash Flow Hypothesis, [40]. Dividend payments to shareholders diminish the amount of money under the manager's control and hence reduce the manager's power. The declaration of dividends notifies shareholders that the managers are acting in their best interests. Alternatively, the existence of taxable dividends could encourage additional institutional shareholders, who may be directly or indirectly involved in the firm's corporate governance framework, allowing it to operate effectively, [41]. However, there is criticism that by issuing a stock dividend, the board of directors would manipulate the stock price, [42]. Thus, the declaration of dividends will influence the stock returns and stock prices.

3 Problem Solution

3.1 Data and Method

The objective of this study is to examine the corporate crime announcement effect on stock price reaction and its determinants in Malaysia. The event study methodology is employed to analyze the effects of corporate crime announcements on the stock price reactions of Malaysian publicly listed companies over the period 2003 to 2020. There are two main variables for the estimation model of an event study, namely the announcement date of the corporate crime announcement and abnormal return. The announcement date is compiled from Securities Commission Malaysia, which shows that public companies listed in Bursa Malaysia have committed crimes from 2003 to 2020. The first appearance of an announcement of corporate crime by the sample company is referred to as the announcement date and denoted as t=0. Meanwhile, the abnormal return data was taken from the Bursa Malaysia website from the stock price of a committed corporate crime company and the event window is designed to be 90 days before and after the event (-90 to +90). This research follows prior studies by using daily stock return data to allow more precise measurement of abnormal returns and more informative studies of the announcement effect, [20]. Abnormal returns can be determined by finding the difference between actual returns and the expected return of the stock. The equation to obtain an abnormal return can be expressed as in Equation (1):

$$r_t = \alpha + \beta r_{m,t} + e_t \tag{1}$$

where,
r_t = the return of stock on the firm in period t
α = risk-free rate or the intercept term.
β = the riskiness of the stock to the market rate of return.
r_{mt} = market index returns in period t; and
e_t = residual error from firm-specific events.

The abnormal performance stock can be measured by taking the residual, e_t. In other words, abnormal returns AR_t are the residuals from the regression during the estimation period. The residual error, e_t can be computed for each period as in Equation (2):

$$e_t = r_t - (\alpha + \beta r_{m,t}) \tag{2}$$

Hence, if e_t or AR_{jt} is less than zero, then the stock's actual return, r_t is less than the expected return $\hat{r}_t$. Since the anticipated expected return $\hat{r}_t$ is equal to $\alpha + \beta r_{m,t}$, Equation (2) can be simplified as $e_t = r_t - \hat{r}_t$. Therefore, it means that an abnormal return is given for all stocks in period t as in Equation (3):

$$e_t = AR_{jt} \tag{3}$$

In addition, the Average Abnormal Returns ($AARs$) can be defined over the sample of a firm's stocks, N at each day t, which can be specified to minimize idiosyncrasies in measuring such particular stocks. The estimator of the average abnormal return ($AARs$) for each day t can be computed as follows in Equation (4):

$$AAR_t = \frac{1}{N} \sum_{j=1}^{N} AR_{jt} \tag{4}$$

where,
AAR_t = average abnormal return in period t
AR_{jt} = the estimator of the abnormal return for stock j
N = number of stocks in the sample

As mentioned, the unrelated details will be removed from the analysis because the effect of the event must be reflected on average and the abnormal returns are all based on the event, [43]. Furthermore, the authors in, [44], used the residual within the event period to estimate the abnormal return from the market model. They revealed that the summary of the AAR_s that has been estimated over months to assess the average cumulative effects on the sample of specific stock information of the company reaching the market from the beginning of the research period to any event date t. In addition, the computation on AAR_t is not adequate due to the uncertainty of the event date's probability, [45]. Hence, the AAR_t of any date before or during the event window will be accumulated to avoid bias from uncertainty, [6]. This is the sum of the Cumulative Average Abnormal Returns ($CAARs$) as shown in Equation (5):

$$CAAR = \sum_{t-k}^{t} AAR_i \tag{5}$$

Some authors in, [46], have mentioned that the statistical significance of $AARs$ and $CAARs$ is determined to test the null hypothesis of no effect of a merger announcement on the share price by using

a simple t-test. Besides, the authors in, [47], suggested that the average stock returns of bad news generally result in a negative return rather than positive returns (good news). Therefore, this study observes the significance of the negative abnormal return of the event announcement and can reflect the impact of the announcement on stock prices. The null hypothesis is defined as follows in Equation (6):

$$H_o : E\left(AR_{jt}\right) \geq 0 \qquad (6)$$

The t-test has been used for a given sample to examine the level of significance for abnormal returns and estimate the standard error of the returns to ensure their reliability and stability from the time series of $AARs$ for the estimation period. The t-test formula for $AARs$ is computed as follows in Equation (7):

$$AAR_t \; t \; stat = \frac{AAR_t}{\sigma\,(AAR_t)} \qquad (7)$$

The t-test formula for testing $CAARs$ is computed as follows in Equation (8):

$$CAAR_t \; t \; stat = \frac{CAAR_t}{\sigma\,(AAR_t)\sqrt{N_t}} \qquad (8)$$

Many researchers applied the estimation of standard deviation for CAAR in their studies to analyze the pattern and speed of the price adjustments towards the event, [6], [12], [19]. Aside from that, this study also aims to investigate the determinants of the stock price in the context of firms involved in corporate crime. In this study, we are focused on four determinants of stock price, namely firm size (LogMCAP), price to book value (PBV), earnings per share (EPS), and dividends per share (DPS). The secondary data for these variables will be obtained from the annual financial statements of a publicly listed company in Bursa Malaysia that reported a corporate crime to the Securities Commission Malaysia during the period 2003 to 2020. Meanwhile, the yearly closing stock price is obtained from Bursa Malaysia with the companies that committed crimes from 2003-2020.

3.2 Description of Variables

3.2.1 Stock Price
Stock price (Y) is the dependent variable in this study. The stock price is defined as the cost of buying a security on a stock exchange, [28]. The share price of the stock depends on several variables, such as earnings per share, dividends per share, business size, dividend yield, and others. Investors are always careful when buying stock because the stock price is known to fluctuate dramatically in this particular market. By following the authors in [28], the stock price is measured by:

Y = Closing stock price as of 31st December for the year studied

3.2.2 Firm Size
Firm size (LogMCAP) is one of the determinants of the stock price in the context of firms involved in corporate crime, [30]. They defined LogMCAP as the natural log of market capitalization at the fiscal year-end before the announcement. In their research, $CAR_{i,t}$ was the calculation of shareholder wealth, which is proxies for stock price reactions, whereas market capitalization is proxies of the market size of the firm as the independent variable to study the reputation of a firm. As mentioned, the firm size is suggested to use log form to mitigate the high skewness of firm size data and standardize the data based on the rule of thumb in corporate finance, [48]. By following the authors in, [30], the LogMCAP is measured by:

LogMCAP = Current share price x Number of shares outstanding

3.2.3 Price to Book Value
Price to book value (PBV) calculates the relative value of a company compared with its market value. This ratio indicates how much equity investors pay for every dollar of net assets. It is important to prospective investors and analysts because it shows whether the company is undervalued or overvalued. A high PBV ratio implies an overvalued stock price, where the stock market price is greater than the book value of the balance sheet equity. This will impact investors because they will not be able to buy a particular company's shares at an overvalued price. By following the authors in, [49], PBV is calculated by:

PBV = Price per share / Book value of equity per share

3.2.4 Earnings per Share

Earnings per share (EPS) is the efficiency of both management and business results, [28]. Company EPS information illustrates the scale of the net profit of the company that is ready to be distributed to the owners of the company. This ratio indicates how much benefit (return) per share the owner receives from investors. A higher EPS means that the business would give investors a great income opportunity. By following the authors in, [28], the EPS is calculated by:

EPS = Net income / Number of shares outstanding

3.2.5 Dividend per Share

Dividend per share (DPS) is the return earned per share. The ratio of DPS ignores income held in the company. The net profit after taxes belongs to shareholders, but the amount of profits distributed and charged as a cash dividend is the money shareholders receive. It is a reward for the investment risk taken by the investor. It is a share of the company's profit that is distributed among its shareholders. DPS is a strategic payout to a class of shareholders of a part of the company's taxable earnings managed by a board of executives. By following the authors in, [28], the DPS is calculated by:

DPS = Dividends paid / Number of shares outstanding

3.3 Statistical Analysis

There are several statistical analyses employed in this study to obtain empirical results. A descriptive statistic is one of the analyses that summarize the data of the variables by including central tendency and variability measurements. Central tendency tests include mean, median, and mode, whereas variability measurements include standard deviation, maximum and minimum value. Besides, Pearson correlation analysis is a measure of the linear association between two variables.

Furthermore, panel regression analysis is used to investigate the determinants of the stock price in the context of firms involved in corporate crime from 2003-2020. The panel regression model is a statistical method to examine two-dimensional data with a combination of cross-section data and time series, where the same unit cross-section is measured at different times, [50]. This study is used to examine relationships between dependent (stock price) and independent variables, which are built

from firm size (LogMCAP), price to book value (PBV), earnings per share (EPS), and dividend per share (DPS). In the regression model, the α and β represent the y-intercept and slope. The β_1 to β_4 represents the correlation coefficient between the dependent and independent variables. If the estimated β_1 to β_4 is statistically significant, it shows a significant effect of independent variables on the dependent variable. The panel regression model can be expressed as:

$$Y_{i,t} = \alpha + \beta_1 LogMCAP_{i,t} + \beta_2 PBV_{i,t} + \beta_3 EPS_{i,t} + \beta_4 DPS_{i,t} + \varepsilon_{i,t}$$

Generally, three estimation models are employed in this study, namely the Pooled Ordinary Least Squares (OLS) model, the Fixed Effect (FE) model, and the Random Effect (RE) model. The OLS model is unique in that it does not measure the impact of its variables as separate entities. Instead, it just measures the independent variables' overall effects on the dependent variable. The pooled OLS regression model can be expressed as:

$$Y_{i,t} = \alpha + \beta_1 LogMCAP_{i,t} + \beta_2 PBV_{i,t} + \beta_3 EPS_{i,t} + \beta_4 DPS_{i,t} + \varepsilon_{i,t}$$

By using this model, the coefficients and intercept are assumed to be homogeneous. Besides, the error term in this model should have a zero mean and be uncorrelated with the independent variables, ensuring that the OLS result is unbiased and consistent. As a result, if the error term is associated with the independent variables, the assumptions are invalidated, and the OLS regression model becomes biased and inconsistent. Therefore, the FE and RE models are two alternative models.

The Random Effect (RE) model is a statistical model in which the parameters are varied randomly. The RE model is frequently used in panel data analysis to estimate the variance of the groups and error term and it assumes that the intercept and slope are constant. The demeaning factor (λ) has been added to the RE model. The value of λ ranges between zero and one and is based on the estimation of the variance components. However, if the standard error of the model is discovered to be high, the RE model will not apply because the dummy variable is included in the error term. Hence, the RE model in this study can be expressed as follows:

$$Y_{i,t} = \alpha + \beta_1 LogMCAP_{i,t} + \beta_2 PBV_{i,t} + \beta_3 EPS_{i,t} + \beta_4 DPS_{i,t} + \lambda_i + \varepsilon_{i,t}$$

On the other hand, the Fixed Effect (FE) model is a statistical model in which the parameters of its components are fixed rather than random. When there are differing intercepts among groups, it is commonly used as a measure. Ordinary Least Squares (OLS) regressions with dummies can be used to test this model. In contrast to the RE model, where the dummy is part of the error term, the dummy in the FE model is part of the model's intercept. As a result, the dummy variable must be included in the intercept. Hence, the FE model can be expressed as follows:

$$Y_{i,t} = (\alpha + \lambda_i) + \beta_1 LogMCAP_{i,t} + \beta_2 PBV_{i,t} + \beta_3 EPS_{i,t} + \beta_4 DPS_{i,t} + \varepsilon_{i,t}$$

Furthermore, some diagnostic tests were conducted in this study to further determine the nature of the data employed. For instance, the Breusch-Pagan LM test is used to choose between the pooled model and the random effect model, whereas the Hausman test is used to check whether the random effect model or fixed effect model is more appropriate for the study. In addition, the multicollinearity test is also used to test the correlation between explanatory variables in a regression model. The diagnostic test also includes a normality test, autocorrelation test, and heteroscedasticity test.

3.4 Result

3.4.1 Event Study
Table 1 (Appendices) shows the list of companies, the nature of the offence, and the announcement date of the corporate crime event. The official website of the Securities Commission Malaysia will be used to compile a list of publicly traded firms in Bursa Malaysia that have committed corporate crimes. Based on trade activity and data availability, the target company is chosen. After the filtering process, 11 announcements involve 9 companies in committing corporate crimes over the period 2003 to 2020. Based on Table 1 (Appendices), the nature of offences in Malaysia is dominated by insider trading and the furnishing of false statements. Besides, two companies have been found to commit corporate crimes on two occasions, which are Inix

Technologies Holding Berhad and Three-A Resources Berhad.

Once the final sample of companies has been found, the stock's abnormal return (AR) will be calculated individually. The AR will be measured daily to manage the factors that have an impact on stock returns within the event window of 90 days before the announcement and for the following 90 days. The computation of AARs can remove irrelevant details from the analysis due to the influence of the event must be reflected on average and the abnormal returns are all based on the event, [43].

Figure 1 shows the plot of AARs for the target company. The y-axis represented the AARs in percentage and the x-axis referred to the trading day in the event window of [-90, 90]. The announcement date of an event is denoted as 0 on the x-axis. Besides, the AARs imply that the extra profits earned by shareholders for the holding period of issued shares are released after the announcements. The abnormal returns that are related to the corporate crime announcement exist when the AARs are less than 0. Meanwhile, if the announcement were considered something bad, it would likely cause the stock price to react negatively. This can be proved by prior studies that show that stock prices will react negatively more than estimated, [6], [12], [19].

Table 2 (Appendices) shows the daily AARs and CAARs for event days -90 to +90 with the t-value. The first column refers to the trading day of the event window [-90, 90]. The second column represents the AARs in percentage, while the third column is the t-value for the AARs. Besides, the fourth column refers to the CAARs in percentage and the last column is the t-value for CAARs. Referring to Table 2 (Appendices), the findings found that the AARs on the announcement date (t=0) are -0.6787% and it is insignificant at the 5% level. Hence, the null hypothesis in terms of AAR cannot be rejected and it is concluded that the announcement day does not show a negative abnormal return. However, the results were against the author in, [12], who reported a significant negative AAR on the day of the announcement. In addition, the AARs on three days prior to announcement day is 0.7189% decreasing to 0.3188% on the day before announcement day. While on the first day after the announcement of corporate crime (t=1), the AARs increased to -0.1378% and subsequently increased to 0.0616% on

the second day. However, these values are not significant at the 5% level. The empirical findings indicated that the information leakage or rumors of the event had reached the market before the corporate crime was announced, [51]. In short, there are no significant abnormal returns to shareholders in this sample of the target company that is associated with corporate crime across the holding period. The t-test showed that the AARs for the ten-day interval before and after the date of the announcements are not significant at the 5% level. This indicates that the announcement of corporate crime would not affect the company's stock price. This reflects that the investors of the charged company do not behave immediately in terms of selling out their stocks even though the announcement is released. Therefore, the result is aligned with the authors in, [6], which stated that the AARs are not significant surrounding the day of information releases.

Figure 2 illustrates the plot of CAARs based on daily returns within the event window for 90 days before and after the announcement date. The x-axis represented the stock trading days in relation to the announcement date, whereas the y-axis represented the CAARs value. CAARs are important to capture the announcement effect of an event on a company's stock return because some of the stock market reaction to the event may exist on the surrounding days or the actual announcement day within the event window, [51]. Referring to Table 2 (Appendices), the CAARs show a drastic decrease from 7.9075% (three days before the announcement date) to -6.1023% (two days prior to the announcement date). This situation demonstrates that rumors about corporate crime have leaked to the public. It happens frequently in Malaysia because Bursa Malaysia Securities Berhad will arrest those who inquire before a company is charged under the Securities Commission, [19]. Furthermore, the findings also indicate statistically significant and negative CAARs on the announcement day. Hence, it can be concluded that there is a significant negative abnormal return on share price relative to the announcement effect of corporate crime in Malaysia. By following the arguments of the author in, [12], if the market is efficient, the market can't have significant negative abnormal returns on event day and subsequent days due to the spontaneous reaction of stock price towards the announcement. From the findings, a significant negative abnormal return exists on the announcement date, day 3, and

day 5 after the announcement reflecting that the market is not efficient. This finding is aligned with the study of the authors in, [19], [20], which concluded that the stock market in Malaysia is not reacting efficiently to the announcement of corporate crime.

3.4.2 Descriptive Statistics Analysis

Table 3 (Appendices) tabulates the results obtained from the descriptive analysis. This analysis illustrates data from all variables used in this study, namely stock price, firm size, price-to-book value, earnings per share, and dividends per share. It provides basic information about variables, which include the mean, standard deviation, minimum and maximum value of the variables.

Based on Table 3 (Appendices), the mean of Y is 0.8864 with a minimum of 0.045 and a maximum of 4.446. The standard deviation is 0.9753, indicating that the data are centred on the mean. This indicates that the data for Y was stable and there was less fluctuation. Besides, the mean of LogMCAP is 7.9140, with a minimum value of 6.5213 and a maximum value of 10.3806. The standard deviation of the LogMCAP is 0.9362, which indicates that the LogMCAP data has high skewness and is stable.

In addition, PBV has a mean of 0.8229 with a standard deviation of 1.0425. This indicates that the investor will infer a PBV of less than one to indicate that a stock is undervalued, on average. Besides, a maximum value of PBV (4.43) implies an overvalued stock price when the market price is greater than the book value of shareholders' equity. The minimum value of PBV (-8.09) indicates that the firm that is involved in crime has sustained negative shareholder equity during the period of study.

Moreover, there is a wide variation in the minimum and maximum values of EPS, which are -75.32 and 70.12, respectively. The mean of EPS is 7.718 and the standard deviation of EPS is 21.8189, which means that the EPS in the sample is widely dispersed. Furthermore, the results of DPS show a mean value of 4.6467 with a minimum value of zero and a maximum value of 38.2. There is a respectable difference in the minimum and maximum values because there are companies that are not paying dividends at all in the sample. The standard deviation of DPS is 8.5075, which implies that the value of DPS on the date is farther away from the mean, on average. The standard deviation

of DPS is 8.5075, which implies that the values of the DPS in the data set are farther away from the mean, on average.

3.4.3 Pearson Correlation Analysis

Table 4 (Appendices) shows the analysis of Pearson correlation among the variables studied, namely stock price (Y), firm size (LogMCAP), price to book value (PBV), earnings per share (EPS), and dividends per share (DPS).

From Table 4 (Appendices), the stock price has a strong positive correlation with firm size and dividends per share, which are 0.8588 and 0.8370, respectively. This is in line with the study of [28], who found that there is a positive correlation between stock price and firm size. Dividends per share are positively correlated with the stock price, with an increase in dividend per share ratios leading to an increase in stock price, [52]. Furthermore, earnings per share and stock price have a positive correlation of 0.6381 and a statistical significance of 1%, which is consistent with the author in, [52]. Besides, the price to book value has a positive correlation of 0.1696 with the stock price, which is aligned with the authors in, [53].

In addition, the correlation between firm size and dividends per share indicates a strong positive correlation, which is 0.7787 and it is statistically at a 1% significance level. Moreover, a positive correlation between firm size and price to book value is statistically at a 5% level. Companies with large total assets have reached the maturity stage and are considered to have good prospects, [54]. When a company has a large total asset base, the ease with which the company can be controlled will increase the company's value. Besides, a positive and significant correlation is found between firm size and earnings per share. The greater the company size, the more likely it is that profitability will increase and the value of the company's earnings per share will increase, [55]. This is because the larger the company, the more assets it has that can be used to generate profits, increasing the earnings-per-share ratio.

Furthermore, earnings per share and dividend per share have a positive correlation of 0.7534, and this correlation is significant at the 1% level. This is consistent with the findings of the authors in, [56], who found that the firm's dividend payout is majorly influenced by its performance for the period and that real earnings are preferred by investors over capital gains. Meanwhile, the correlation between

earnings per share and dividends per share with the price-to-book value is positive, however, no evidence has been found to support the significance of the positive relationship. Besides, it is against the authors in, [57], who found a significant and positive correlation between earnings per share and price to book value.

3.4.4 Panel Regression Model

Table 5 (Appendices) shows the results obtained from three different panel regression analyses. Based on Table 5 (Appendices), LogMCAP and DPS are found to be significant at a 1% significance level, while EPS is insignificant in all three models. Besides, PBV was found to be significant at a 10% significance level in the pooled OLS model. The study has continued with the Breusch-Pagan LM test and Hausman test to determine which of these models would best fit and represent the data employed in this study.

Breusch-Pagan Lagrange Multiplier (LM) test is conducted to choose between the pooled OLS model and the random effect model. It tests the null hypothesis of whether the total OLS estimate is sufficient to satisfy the selection of the random effect model. The null and alternative hypotheses are as follows:

$$H_0: \text{POLS is appropriate.}$$
$$H_a: \text{RE model is appropriate.}$$

From the results in Table 5 (Appendices), the p-value for the Breusch-Pagan LM Test is less than 0.05 and it is significant at a 1% significance level. Hence, this indicates that the null hypothesis is rejected and it concludes that the random effect model is more appropriate compared to the pooled OLS regression model.

Furthermore, the Hausman test is carried out to determine whether the random effect model or fixed effect model is better or appropriate for the study. The null and alternative hypotheses are as follows:

$$H_0: \text{RE model is appropriate.}$$
$$H_a: \text{FE model is appropriate.}$$

Based on the results from Table 5 (Appendices), the p-value for the Hausman test is 0.0000, which is less than 0.05. Hence, the null hypothesis is rejected and it is concluded that the fixed effects model is more suitable for this model. In short, both the null

hypothesis from the Breusch-Pagan LM test and the Hausman test has been rejected, which means that the FE model has been found to be the most appropriate model in this study.

3.4.5 Diagnostic Test
Table 6 (Appendices) shows the results of the diagnostic tests that were carried out to test the error term structure in the fixed effect model in this study. The diagnostic test includes a normality test, multicollinearity test, autocorrelation test, and heteroscedasticity test.

Normality tests will be performed with the purpose to check whether the interference is normally a distribution. To carry out an effective hypothesis test, the normality of the residual is necessary because it can ensure that the t-statistics and p-value of the F test are reliable. In this study, the normality assumption will be tested by the Jarque-Bera Test. Based on Table 6 (Appendices), the p-value of the Normality test is 0.000, which is less than 0.05. Hence, the null hypothesis is rejected and it is concluded that the error term is not normally distributed. This is because the data is affected by the announcement effect of corporate crime and becomes not normally distributed.

A multicollinearity test is required to detect whether a multicollinearity problem exists in the model. In this study, Variance Inflation Factor (VIF) will be conducted to see whether the multicollinearity problem exists in this model. If the VIF exceeds 10, there might exist a multicollinearity problem. Based on Table 6 (Appendices), the mean VIF is 2.51. Hence, the null hypothesis will not be rejected and there is no perfect multicollinearity between the explanatory variables.

An autocorrelation test was employed to detect the serial correlation problem in the model. It is employed to decide whether the values of the error term are correlated. In this study, Breusch-Godfrey (BG) tests are performed to detect the existence of autocorrelation. Based on Table 6 (Appendices), the p-value of the BG test is 0.2147, which is more than a 5% level of significance. Hence, the null hypothesis will not be rejected, and it is not of statistical significance. It can be concluded that no autocorrelation problem exists in the model.

The heteroscedasticity test is used to detect the error term must be homoscedasticity, which means that the variance of the error terms must be constant. Inversely, heteroscedasticity occurs when different observations have different error variances. In this study, the Modified Wald test was employed to test the heteroscedasticity problem in the fixed effect model. Based on the result in Table 6 (Appendices), the p-value of the test is 0.000, which is less than a 5% significance level. Hence, the null hypothesis will be rejected and it can be concluded that there is the presence of a heteroscedasticity problem in the model.

As summarized in Table 6 (Appendices), there is a heteroscedasticity problem that occurred in the fixed effect model. Hence, the robust standard error is conducted to eliminate the heteroscedasticity problem. The robust standard error is a technique for obtaining unbiased standard errors of the fixed effect model under heteroscedasticity.

3.4.6 Fixed Effect Model with Robustness
Table 7 (Appendices) shows the result of fixed effect regression after using a robust standard error method to arrange the heteroscedasticity problem. The fixed effects regression can be expressed as:

$$Y_t = -7.2768 + 1.0057LogMCAP + 0.0196PBV + 0.0008EPS + 0.0390DPS$$

From Table 7 (Appendices), there is a positive relationship between the firm size and the stock price. When the firm size increases by 1%, the stock price will rise by 1.0057%.

The p-value of the firm size is 0.0003, which is less than the 0.05 significance level. Thus, the null hypothesis is rejected and it is statistically significant at 1%, 5%, and 10% levels of significance. This indicates that firm size has a significant effect on the stock price. This finding is consistent with the authors in, [30], who found that significant positive coefficients of firm size have shown that large market-size firms would experience minor losses of the shareholder's wealth related to announcements of allegations of corporate misconduct. If a particular criminal act imposes a significant component of fixed costs in terms of legal expenses, fines, and loss of goodwill, the percentage wealth decline will be smaller, as the firm's capitalization increases. Firms whose value is based on growth opportunities appear to suffer greater wealth losses as a result of the criminal allegations, and the findings suggest that firm size and reputation are important determinants that should be taken into account when evaluating cross-

sectional differences in wealth losses associated with corporate crime.

Besides, price-to-book value has a positive relationship with the stock price. When 1% increase in price to book value, the stock price increases by 0.0196%. The p-value of the price to book value is 0.646, which is insignificant at 1%, 5%, and 10% significance levels. This indicates PBV is insignificant to stock price. Meanwhile, the finding is against the result of the authors in, [29], [53], who found that PBV is positively significant to explain the variability of stock price. Increasing the worth of a company is a success if it is performed with the aspiration of its owners, because as the firm's value rises, then the owners' wealth also increases, [34]. This indicated that a high corporate value signifies a high level of shareholder wealth. The greater the PBV value, the higher the investor's assessment of the company's shares, causing the stock market price to rise and the capital return to increase. Thus, higher PBV value firms are expected to suffer greater shareholder wealth losses in the criminal allegations, although the PBV coefficient is not statistically significant.

Furthermore, earnings per share have a positive relationship with the stock price, with a coefficient of 0.0008. This indicates that the stock price will increase by 0.0008% when the earnings per share increase by 1%. The p-value of the EPS is 0.657, which is more than the significance level. Hence, the null hypothesis will not be rejected and it is not significant at 1%, 5%, and 10% levels. This concluded that there is no significant relationship between EPS and stock price. Some authors in, [36], explored weak evidence of a reduction in reported earnings following the allegations of fraud allegations. However, there is no evidence of a link between various allegations and changes in corporate earnings. The findings on the link between shareholder wealth losses and analysts' anticipation of bad news were challenging to interpret.

However, this is against the author in, [58], who found that earnings per share did have a significant effect on organizations that had fraud present and organizations that did not have fraud present while controlling for a stock buyback.

Moreover, the coefficient between dividends per share and stock price is 0.0390, which shows a positive relationship. When there is a 1% increase in dividends per share, the stock price will increase by 0.0390%. The p-value is 0.086 and it is significant at a 10% significance level. Hence, the null hypothesis will be rejected and it can be concluded that there is a significant relationship between DPS and stock price. This is consistent with the authors in, [59], findings, which demonstrated a positive correlation between dividends and stock prices. Besides, shareholder wealth is maximized when the company pays regular dividends to shareholders and when the stock price appreciates on the stock market, resulting in financial gains for the investor, [60].

In short, it has been concluded by testing the hypothesis, and the following results were obtained that there is a significant effect of firm size and dividends per share on stock price in the context of firms involved in corporate crime. Besides, R-squared is a measure of the explanatory power of the model between dependent and independent variables. This study has disclosed that a 79.8% variation in stock price is explained by variables LogMCAP, PBV, EPS, and DPS. While the remaining 20.2% was explained by other factors. In addition, rho is used to determine the similarity correlation in this model and the results show that the fixed effect model will cause around 63.82% of the fraction of variance. The value of F-statistics is 29.82 and it is significant at 0.0001%, which implied the model is a good fit.

4 Conclusion

Investigating the effect of corporate crime announcements is a very interesting and intriguing matter. Facts indicate that corporate crime has been continuously increasing and such corporate crime, particularly financial statement fraud and asset misappropriation, would result in significant financial losses to the company. Instead, of huge financial repercussions, corporate crime may have a deterrent effect on society. In short, it may incur some non-financial losses such as lowering social morale and creating social disorganization, as well as damage to the country's reputation, customer relationships, and the firm's equity value. However, studies that investigate the effects of corporate crime, especially the announcement effects on the stock market are limited. Most studies are conducted in developed markets but rarely found in developing market contexts like Malaysia. So far, there are only the authors in [6], [19], [20], investigating the effect of, [20], investigating the effect of corporate crime in corporate crime in Malaysia.

In this study, the efficiency of the stock market towards the corporate crime announcement and the determinants of stock prices are analyzed. The event study methodology was applied to examine the reaction of corporate crime announcements on the stock price. Following the authors in, [12], [19], [20], the finding of this research shows that the AARs on the day of the announcement were negative and not significant at the 5% level. This means that the information or rumors about corporate crime had been leaked to the public before the actual date of announcements. Meanwhile, the CAARs on the announcement day were reported negative and statistically significant at the 5% level. This implies that there is a negative abnormal return to the announcement effect of corporate crime among Malaysian public listed companies during the period 2003-2020. The results indicate that the market is not reacting efficiently to the information released regarding the incidence of corporate crime because the stock price was not fully reflected in all publicly available information.

Aside from that, the finding from the fixed effect model indicates that firm size and DPS are positively significant with stock price in the context of firms involving corporate crime. This finding is aligned with the authors in, [30], who found that large market-size firms would experience minor losses of the shareholder's wealth related to announcements of allegations of corporate misconduct. Besides, shareholder wealth is maximized when the company pays out regular dividends to shareholders and when the stock price appreciates on the stock market, resulting in financial gains for the investor, [60]. However, the findings show that the PBV and EPS had an insignificant effect on stock price in the context of firms involved in corporate crime. This indicated that there is no evidence to be found on the PBV impact on the reaction of stock prices. This is against the findings from the authors in, [29], who found that price to book value is positive and statistically significant to explain the variability of stock price. Additionally, there is no significant relationship between EPS and stock price. This is consistent with the study by, [36], who found no significant relationship between various allegations and changes in corporate earnings.

In addition, the findings of corporate crime and market efficiency may lead to better implications for investors. This research intends to boost investor awareness of corporate governance issues, particularly in publicly traded corporations. The growing relevance of reliable corporate reporting allows the organization to improve its image while also increasing public confidence. According to previous research, ineffective corporate governance in Asian countries has been linked to the dominant power of controlling shareholders.

Furthermore, by developing new programs, this study provides stakeholders with a better understanding of the causes of corporate crime. However, it is essential to improve stakeholder knowledge and assist them in reducing the opportunities for corporate crime within the firm. As a result of this knowledge, stakeholders are becoming more informed and reducing corporate crime cases in Malaysia.

Further, it is difficult to determine the true announcement effect of corporate crimes on the company's stock return due to the challenge of obtaining all of the data for all companies that have committed corporate crimes. This is because the companies that are facing bankruptcy as a result of illegal activity would be deleted by Bursa Malaysia. It makes it difficult for researchers to acquire historical data for those companies. Due to the exclusion of those companies that have become history in the sample of the study, the results will be imperfect. Furthermore, as the sample size of the study is limited, it will result in a small degree of freedom for the t-test in hypothesis testing. As a result, determining relevant facts to illustrate the arguments may be challenging. Therefore, the evidence regarding the significant effect of corporate crime announcements on stock prices is weak due to a lack of significant findings to support the research. Due to the lack of research conducted in this area, researchers are encouraged to do more research about the corporate crime announcement effect and its determinants in the future as this study has become more prominent to the public.

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Appendices

Table 1. Target Companies and Announcement Date of Corporate Crime

No.	Company name	Nature of Offence	Announcement Date
1.	Multi-code Electronics Industries (M) Berhad	Fraud in connection with the purchase of securities	13 March 2009
2.	United U-Li Corporation Berhad	Furnishing false statement	28 April 2009
3.	LFE Corporation Berhad	Criminal breach of trust	24 June 2010
4.	Inix Technologies Holding Bhd	Furnishing of false statements	23 September 2010
5.	Inix Technologies Holding Bhd	Furnishing of false statements	29 September 2011
6.	Sime Darby Berhad	Insider trading	20 July 2012
7.	Lii Hen Industries Berhad	Market manipulation	4 September 2012
8.	Malaysia Pacific Corporation Berhad	Insider trading	10 January 2014
9.	Transocean Holdings Berhad	Insider trading	8 December 2015
10.	Three-A Resources Berhad	Insider trading	25 October 2016
11.	Three-A Resources Berhad	Insider trading	13 February 2018

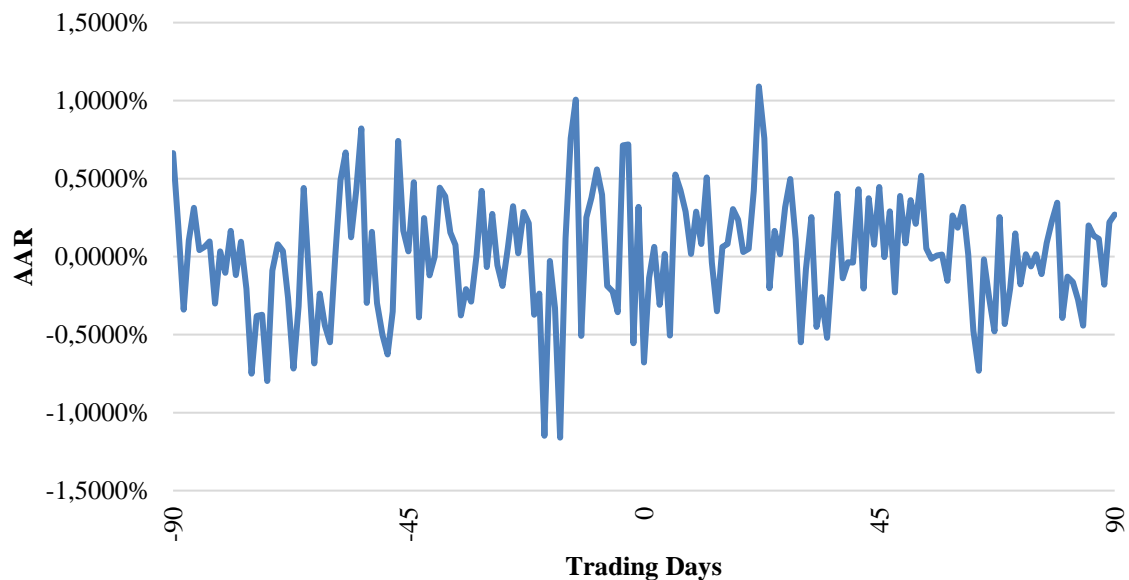*Sources: Securities Commission Malaysia (2020).*

Fig. 1: Plot of AARs for Event Days -90 to 90

Table 2. Daily AARs and CAARs for Event Day -90 to +90 with the t-value

| Trading Days	AAR	AAR t-stat	CAAR	CAAR t-stat
-90	0.6642%	1.7644	7.3065%	5.8518*
-89	0.1988%	0.5281	2.1868%	1.7514
-88	-0.3397%	-0.9023	-3.7365%	-2.9925*
-87	0.1033%	0.2745	1.1365%	0.9103
-86	0.3123%	0.8295	3.4350%	2.7511*
-85	0.0413%	0.1097	0.4542%	0.3637
-84	0.0613%	0.1628	0.6743%	0.5401
-83	0.0975%	0.2591	1.0730%	0.8593
-82	-0.3004%	-0.7979	-3.3044%	-2.6465*
-81	0.0330%	0.0877	0.3633%	0.2910
...	...	...	...	...
-10	0.3773%	1.0023	4.1505%	3.3242*
-9	0.5579%	1.4820	6.1369%	4.9151*
-8	0.3970%	1.0544	4.3665%	3.4971*
-7	-0.1880%	-0.4995	-2.0685%	-1.6567
-6	-0.2234%	-0.5935	-2.4577%	-1.9684*
-5	-0.3563%	-0.9465	-3.9198%	-3.1393*
-4	0.7121%	1.8916	7.8333%	6.2737*
-3	0.7189%	1.9095	7.9075%	6.3331*
-2	-0.5548%	-1.4736	-6.1023%	-4.8873*
-1	0.3188%	0.8468	3.5066%	2.8085*
0	**-0.6787%**	**-1.8028**	**-7.4657%**	**-5.9793***
1	-0.1378%	-0.3661	-1.5159%	-1.2141
2	0.0616%	0.1637	0.6781%	0.5431
3	-0.3099%	-0.8232	-3.4089%	-2.7302*
4	0.0180%	0.0478	0.1979%	0.1585
5	-0.5061%	-1.3443	-5.5668%	-4.4585*
6	0.5250%	1.3946	5.7754%	4.6255*
7	0.4253%	1.1297	4.6783%	3.7469*
8	0.2871%	0.7627	3.1583%	2.5295*
9	0.0177%	0.0470	0.1944%	0.1557
10	0.2882%	0.7655	3.1702%	2.5390*
...	...	...	...	...
81	-0.1282%	-0.3405	-1.4101%	-1.1293
82	-0.1638%	-0.4352	-1.8022%	-1.4434
83	-0.2769%	-0.7355	-3.0458%	-2.4393*
84	-0.4426%	-1.1758	-4.8690%	-3.8996*
85	0.1996%	0.5302	2.1956%	1.7584
86	0.1340%	0.3559	1.4739%	1.1804
87	0.1132%	0.3008	1.2457%	0.9977
88	-0.1795%	-0.4768	-1.9744%	-1.5813
89	0.2206%	0.5860	2.4265%	1.9434
90	0.2705%	0.7185	2.9754%	2.3830*

*Note: * indicates significance at 0.05 level.*
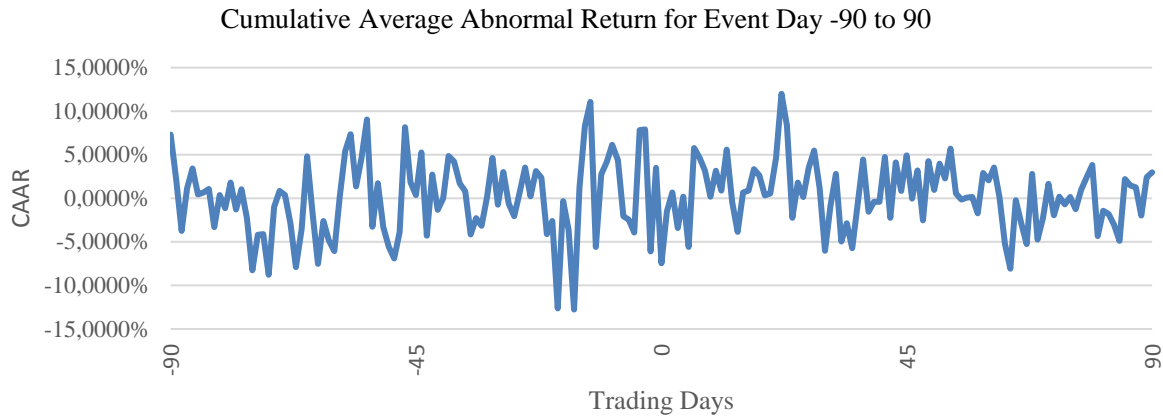
Fig. 2: Plot of CAARs for Event Days -90 to 90

Table 3. Descriptive Statistics Analysis

Variables	Obs	Mean	Std. Dev.	Min.	Max.
Y	162	0.8864	0.9753	0.045	4.446
LogMCAP	162	7.9140	0.9362	6.5213	10.3806
PBV	162	0.8229	1.0425	-8.02	4.43
EPS	162	7.7181	21.8189	-75.32	70.12
DPS	162	4.6467	8.5075	0	38.2

Table 4. Pearson Correlation Analysis

	Y	LogMCAP	PBV	EPS	DPS
Y	1.0000				
LogMCAP	0.8588***	1.0000			
PBV	0.1696**	0.1686**	1.0000		
EPS	0.6381***	0.5902***	0.1088	1.0000	
DPS	0.8370***	0.7787***	0.0397	0.7534***	1.0000

*Note: $p < 0.01$ = ***, $p < 0.05$ = **, $p < 0.1$ = ** *

Table 5. Results obtained from Pooled OLS, Random Effect and Fixed Effect Model

	Pooled OLS Model	Random Effect Model	Fixed Effect Model
LogMCAP	0.5235***	0.7771***	1.0057***
PBV	0.0629*	0.0542	0.0196
EPS	0.0001	0.0006	0.0008
DPS	0.0507***	0.0401***	0.0390***
Constant	-3.5440	-5.4985	-7.2768
R-squared	0.8138	0.9257	0.9186
Observation	162	162	162
Breusch-Pagan LM test	31.69*** (0.0000)		-
Hausman test	-	30.25*** (0.0000)	

*Note: $p < 0.01$ = ***, $p < 0.05$ = **, $p < 0.1$ = ** *

Table 6. Diagnostic Test

Diagnostic Test	
Normality Test	Chi2 = 40.64 P-value = 0.0000
Multicollinearity Test	Mean VIF = 2.51
Autocorrelation Test	F-stat = 1.816 P-value = 0.2147
Heteroscedasticity Test	Chi2 = 17207.90 P-value = 0.0000
Remedies	There is a heteroscedasticity problem that exists in the fixed effects model. Hence, the robust standard error method is used to eliminate the problem.

Table 7. Fixed Effect Regression

Y	Coefficient	Robust Std. Err.	P-value
LogMCAP***	1.005719	0.2331624	0.003
PBV	0.0196163	0.0410583	0.646
EPS	0.0008395	0.0018212	0.657
DPS*	0.0390097	0.0199626	0.086
_cons	-7.276799	1.810659	0.004
R-squared	0.7980		
Observation	162		
F (4,8)	29.82		
Prob > F	0.0001		
Corr (u_i, Xb)	-0.8020		
sigma_u	0.47722729		
sigma_e	0.3592822		
rho	0.63824833		

*Note: $p < 0.01$ = ***, $p < 0.05$ = **, $p < 0.1$ = **

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

Nurul Izza Abd. Malek is the main author, Rossazana Ab Rahim, Michelle Chang Ting Ting, & Nur Zaimah Ubaidillah are co-authors who contribute to the consultation, methodology, data analysis, final solution, and overview of research.

Conflict of Interest

The authors have no conflict of interest to declare.