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## Fraudulent Financial Reporting: An Application of Fraud Models to Malaysian Public Listed Companies

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### Abstract

*There have been great concerns among stakeholders on how fraudulent financial reporting (FFR) can affect reputation of public-listed companies (PLCs). The post Enron era has witnessed many FFR cases around the globe. FFR has impacted many countries around the world including Malaysia, the focus of this paper. FFR not only causes significant ethical concerns to both individuals and companies but also involves a great amount of financial losses. A survey conducted by KPMG (2014) involving Chief Executives in Malaysian PLCs between January 2010 and December 2013 has found that 26% of respondents who experienced fraud were able to state the estimate of fraud losses experienced, which amounted to RM 2.41 million ( $\approx$  USD 0.72 million). Thus, FFR is a major concern for the two primary regulators of capital market in Malaysia; Bursa Malaysia and Securities Commission Malaysia (SC). Both authorities continue to refine the parameters that help to ensure rigorous surveillance over Malaysian PLCs (Danial et al, 2014). Effective anti-fraud programmes which include the ability to detect the likelihood of FFR among Malaysian PLCs continue to be important not only for regulators, but also to the nation. This paper examines the likelihood of FFR among Malaysian PLCs using the Fraud Triangle Model (Cressey, 1953), Fraud Diamond Model (Wolfe & Hermanson, 2004) and Crowe's Fraud Pentagon Model (Crowe, 2011). Based on fraud-risk factors derived from these Fraud Models, this paper explores new perspectives in detecting the likelihood of FFR in the Malaysian context.*

Keywords: Fraudulent Financial Reporting, Fraud Models, Malaysian Public-Listed Companies

### INTRODUCTION

Financial reporting is important in disseminating financial information about an organisation or a company. Financial reporting reflects management's accountability and efficiency in managing financial resources and expenses. For PLCs, financial reports in annual reports are regarded as the main form of communication with shareholders as well as the public (Stanton & Stanton, 2002). From an accounting perspective, financial reports which include balance sheet, income statement and cash flow statement could potentially being used as fraudulent tools. Such unethical action in this research is regarded as FFR.

Fraud (including FFR) is a dominant white collar crime in today's business environment (Palshikar, 2002). For example, Abrecht et al. (2004) report that among the largest bankruptcies

in the United State of America (USA) history which involve FFR and/or Chief Executive Officer (CEO) fraud are WorldCom (USD 101.9 billions of total assets) and Enron (USD 63.4 billions of total assets). Many capital market players recognise the potential harm to the business, caused by FFR. In Malaysia, recent corporate scandals due to FFR have suggested that there is a strong connection between fraud and weak corporate governance (KPMG, 2014). A survey conducted by KPMG (2014) with the Chief Executives of Malaysian PLCs between January 2010 and December 2012 has found that 89% of respondents felt that the quantum of fraud has increased over the past three years. 83% of them felt that fraud is a major problem for Malaysian businesses in general and 94% believed that fraud has become more sophisticated (KPMG, 2014). 26% of respondents who experienced fraud agreed that the total loss caused by fraud amounted to RM 2.41 million ( $\approx$  USD 0.72 million) (KPMG, 2014). 68% of respondents felt that poor internal controls and lack of skills among internal audit teams to detect fraud are the major factors that triggered fraudulent acts in their companies (KPMG, 2014).

However, fraud and FFR are not new in Malaysia. Several FFR cases involving Malaysian PLCs have been reported over the past 20 years. Some of these cases are Megan Media and Transmile Bhd (Ali, 1994; Dalnial et al, 2014). Transmile Bhd was reported to have accounting irregularities, overstating revenues in 2004, 2005 and 2006 by a total value of RM 622 million ( $\approx$  USD 185.67 million) (Dalnial et al, 2014). This case has led to several other Malaysian PLCs being investigated such as Megan Media Holdings Bhd and Welli Multi Corp Bhd (Dalnial et al., 2014). Therefore, managing fraud-risk factors has become one of the centre focuses among Malaysian PLCs (Dalnial et al., 2004). Certain measures have been enhanced by the government and accounting regulatory bodies to mitigate the occurrence of fraud and FFR (Zawawi, 2010).

One of the factors for the FFR increasing trends is that Malaysia has been recognised as one of the strong political-driven developing country in Asia (Credit Suisse, 2012). Malaysia has been practising centralised-administration system that adopts clear separation in control and power (Hofstede Centre, 2014). According to the Hofstede Centre (2014), Malaysia scores very high on Power Distance Index (PDI), which is 100 as compared to other ASEAN countries, such as Thailand (64), Vietnam (70), Singapore (74) and Indonesia (78). PDI has been using as a measurement tool in the social science researches that aim to make comparisons across different countries or cultures. The index range score between 1 (lowest) and 120 (highest) is being used to measure the gap. The index shows that many Malaysians accept a hierarchical order in which everybody has a place and which needs no further justification (Hofstede Centre, 2014).

From the perspective of an organisation, the score reflects inherent inequalities, centralisation administration, subordinates expect to be told what to do and the ideal boss being a benevolent autocrat (Hofstede Centre, 2014). Although characteristics of Hofstede's PDI (2014) are not totally conclusive in the Malaysian context, these features are best described by a few financial crisis examples that have been hitting some of Malaysian PLCs such as Megan Media and Transmile Bhd. Meanwhile, according to Transparency International (2014), Malaysia is ranked 53 out of 177 countries for Corruption Perception Index (CPI) for the year 2013 as compared to 2012 (54 out of 176 countries). The PDI and CPI statistics show that there is a high tendency for fraud and FFR to repetitively occur in the country, even in corporate entities which involve PLCs. Although a continuous process within a change programme of public and private sector transformation has been undertaken, the country is still suffering from the 'political-driven' image.

This perspective has made FFR-related researches in Malaysia unique and motivating. This paper examines the likelihood of FFR among Malaysian PLCs using fraud-risk factors of the Fraud Models; the Fraud Triangle Model (Cressey 1953), the Fraud Diamond Model (Wolfe & Hermanson, 2004) and Crowe's Fraud Pentagon Model (Crowe, 2011). There are a number of studies on fraud-risk factors which use the Fraud Triangle Model (Heiman-Hoffman et al., 1996; Albrecht et al., 2004; Wilks & Zimbelman, 2004; Skousen & Wright, 2006; Albrecht et al., 2008; Rae & Subramaniam, 2008; Skousen et al., 2009; Lou & Wang, 2011; Ravisankar et al., 2011; Dorminey et al., 2012; Tugas, 2012; Aghghaleh, 2014). However, limited number of studies use the Fraud Diamond Model (Omar & Mohamad Din, 2010) and no studies use Crowe's Fraud Pentagon Model in the Malaysian context. Therefore, this research is set to address this gap of knowledge. This research is motivated as there are relatively none of empirical research studies that have undertaken particularly on accessing fraud-risk factors using all three Models (the Fraud Models) concurrently in detecting the likelihood of FFR among Malaysian PLCs.

Moreover, the lack of research on FFR conducted on developing countries indicates the need for more research to reflect the political and corporate governance culture in these countries. Having known that these Fraud Models have been developed in Western countries, there has been concern that these Fraud Models may not fit the peculiar political and corporate governance needs of developing countries, such as Malaysia.

The paper is structured in the following fashion. The first section discusses on the Fraud Models, which comprises the Fraud Triangle Model (Cressey, 1953), the Fraud Diamond Model (Wolfe & Hermanson, 2004) and Crowe's Fraud Pentagon Model (Crowe, 2011). Related fraud-risk factors from these Models are also being addressed in this section. The second section explains research design which draws methodology for the research. The following section provides interview findings in the context of Malaysian PLCs. Hypotheses development are being discussed in the next section, followed by sample selection and explanation on related proxies for quantitative analysis. This paper is concluded by potential contributions of the research as an academic evidence, as well as providing different perspectives of corporate culture in detecting the likelihood of FFR.

## **THE FRAUD MODELS**

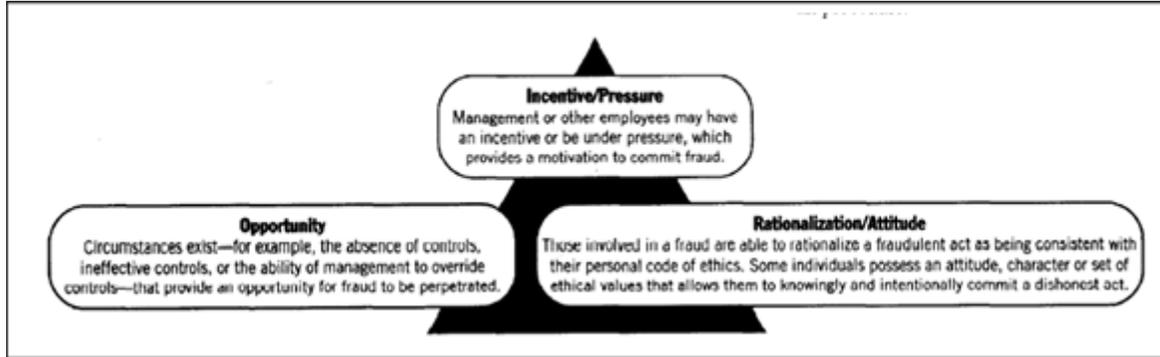
### **1. Fraud Triangle Model**

The Fraud Triangle Model was created by Dr. Donald R. Cressey (1953), an American sociologist and criminologist. He focused his research on the circumstances that lead individuals to engage in fraudulent and unethical activity. Later, his research became known as the Fraud Triangle Model (Dorminey et al, 2010; 2012; Ruankaew, 2013).

The Fraud Triangle Model (Cressey, 1953) provides a model to identify factors that caused fraudsters to commit fraud. These factors are: (1) incentive/pressure; (2) opportunity; and (3) attitude/rationalisation (Cressey, 1953). Albrecht et al. (2004) compared this theory to a fire, using the simple explanation of three elements that are necessary to cause a fire, which are (1) oxygen; (2) fuel; and (3) heat. Applying this similar concept that can cause a fire, fraud is unlikely to occur in the absence of the three elements mentioned in the fraud triangle theory, and the severity of fraud depends on the strength of each element (Albrecht et al., 2004). In other

words, for an individual to make unethical decisions, perceived pressure, an opportunity, and a way to rationalise the behaviours must exist (Albrecht et al., 2004; Lou & Wang, 2011; Ruankaew, 2013). Figure 1 lists the factors of the Fraud Triangle Model (Cressey, 1953).

Figure 1: Three Factors of the Fraud Triangle Model (Source: Ramos, 2003)

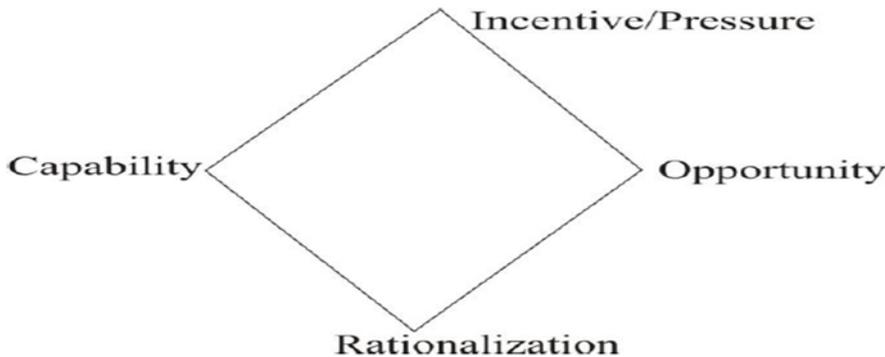


## 2. Fraud Diamond Model

The Fraud Diamond Model (Figure 2) was introduced by Wolfe and Hermanson (2004) as an extension version of the Fraud Triangle Model (Cressey, 1953). The model adds ‘capability’ as the fourth fraud-risk factor. They believe most of the frauds would not have occurred without the right person with the right capabilities implementing the details of the fraud (Wolfe & Hermanson, 2004).

They also suggest four observable traits for committing fraud; (1) authoritative position (power) or function within the organisation; (2) capacity to understand and exploit accounting systems and internal control weaknesses; (3) confidence that he/she will not be detected or if caught he/she will get out of it easily; and (4) capability to deal with the stress created within an otherwise good person when he/she commits bad acts (Wolfe & Hermanson, 2004).

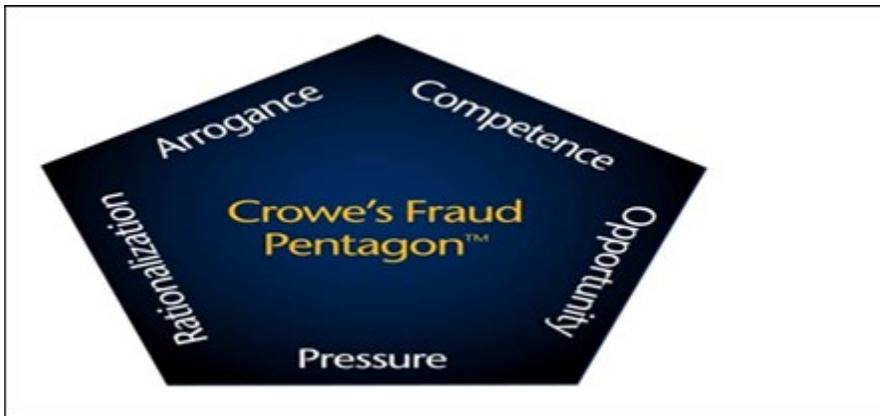
Figure 2: The Fraud Diamond Model (Source: Wolfe & Hermanson, 2004)



### 3. Crowe's Fraud Pentagon Model

The Fraud Pentagon, also known as Crowe's Fraud Pentagon Model (2011) is an expansion of the Fraud Triangle Model (Cressey, 1953). The model was developed by Jonathan Marks, a partner and a leader of the Fraud, Ethics, and Anti-Corruption Product and Solutions initiative at Crowe Horwath LLP in the US. Tailoring with today's environment, Crowe's Fraud Pentagon (Figure 3) factored two additional elements with the Fraud Triangle Model (Cressey, 1953), which are arrogance and competence. Arrogance or lack of conscience is an attitude of superiority and entitlement or greed on the part of a person who believes that internal controls simply do not personally apply (Crowe, 2011).

Figure 3: The Crowe's Fraud Pentagon Model (Source: Crowe, 2011)



The general concept of capability and competence are similarly defined in the Fraud Diamond (Wolfe & Hermanson, 2004) and Crowe's Fraud Pentagon Model (Crowe, 2011). Capability/competence represents an employee's ability to override or manipulate internal controls, develop a sophisticated concealment strategy and socially control the situation to his/her advantage (Wolfe & Hermanson, 2004; Crowe, 2011). As such, this research measure capability/competence in the same definition from the both Fraud Models (Wolfe & Hermanson, 2004; Crowe, 2011). According to Crowe (2011), a study by the Committee of Sponsoring Organisations of the Treadway Commission (COSO) has found that 70% of fraudsters have a profile that combines pressure with arrogance or greed and 89% of fraud cases involved CEO. Crowe (2011) suggests that there are five elements of arrogance from the perspective of CEO, which are:

- (1) big egos – CEO is seen as a 'celebrity' rather than a businessman;
- (2) they can circumvent internal controls and not get caught;
- (3) they have bully-attitude;
- (4) they practise autocratic management style; and
- (5) fear they will lose their position or status.

These arrogance elements can evolve into extreme arrogance of Hubris factor, which conceal negative impact underneath that can destroy a career or company (Crowe, 2011). This

phenomenon is best illustrated as an ice-berg, which looks small and not intimidating from afar, but can cause massive destruction when it collides with something.

## RESEARCH DESIGN

This research adopts a mixed-method design which draws on both qualitative (interviews) and quantitative (financial and non-financial data analysis) methods. This research uses semi-structured interview, which provides an efficient balance of structure and openness. Semi-structured interview allows the researcher to have a certain degree of control in data collection, but at the same time allows interviewees to provide additional information as they see fit (Creswell, 2009). Deductive approach is used to determine suitable hypotheses and proxies from previous literature, while inductive approach is used to discover practical and real world perspectives from the interviewees. Figure 4 illustrates the process.

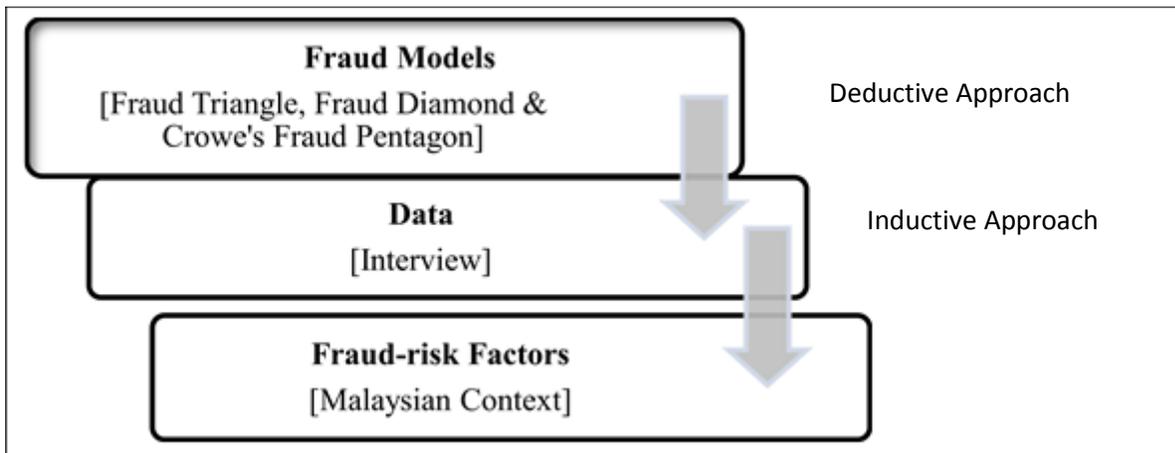


Figure 4: Deductive and Inductive Approaches prior to Hypotheses Development for the Research (Source: Current Study)

Financial and non-financial data analysis is being used in most of the previous literature that examine Fraud Models (Albrecht et al., 2004; Lou & Wang, 2011; Skousen et al., 2009; Manurung & Hadian, 2013 and Aghghaleh, 2014). In fact, such analyse methods have been widely used as the main research methods in examining fraud-risk factors since 1980's (i.e. Elliot & Wellingham, 1980; Romney et al., 1980; Pincus, 1989; Finkelstein, 1992; Hambrick & D'Aveni, 1992; Collier, 1993; Haleblan & Finkelstein, 1993; Albrecht et al., 1995; Daboub et al., 1995; Beasley, 1996; Dechow et al., 1996; Flesher, 1996; Summers & Sweeney, 1998; Hillison et al., 1999). Therefore, this research adopts quantitative method as the major approach. Financial and non-financial data from Malaysian PLCs' annual reports will be analysed using statistical analysis.

## INTERVIEW FINDINGS

The main objective of the interviews is to make sure that the proxies for this research are accurately selected and fit for the quantitative analysis. As the Fraud Models (Fraud Triangle, Fraud Diamond and Crowe's Fraud Pentagon) have been developed in the Western countries has made the interviews significantly viable to confirm the suitability of these Models among the Malaysian PLCs context. Hence, these interviewees are imperative to contribute practical and real world perspectives on FFR within the Malaysian context. The face-to-face interviews were conducted during the month of July and August 2014 in Malaysia. A total of six interviewees had agreed to participate in these interviews. Through an exploratory approach, interview findings provide a complex, detailed understanding on each of the proxies for this research. This detail can only be established by having face-to-face interviews and allowing interviewees to share their perspectives unencumbered by the expected findings from previous literature and research studies (Creswell, 2007). Therefore, 6 interviews were considered sufficient for this purpose.

All interviewees represent different category of positions in Malaysian PLCs. These interviewees have their own area of expertise and experience in conducting their responsibilities in Malaysian PLCs. Based on these differences, the interviews aim to gain different perspectives on the same issues or subjects of the interview questions. Interview findings provide three important contributions for the research, which are:

- (1) confirmation of the existing fraud-risk factors (i.e. incentive, pressure, opportunity, attitude, rationalisation, capability/competence and arrogance) from the Fraud Models (Fraud Triangle, Fraud Diamond and Crowe's Fraud Pentagon);
- (2) discovering new fraud-risk factors (i.e. greed, ignorance and determination) in Malaysian PLCs' context; and
- (3) suggesting new proxies for the research hypotheses.

Greed, ignorance and determination have emerged as the new fraud-risk factors for Malaysian specific findings identified from the interviews. Greed is being addressed as part of personal financial pressure that relates to employees' motivation to commit fraud (Rae & Subramaniam, 2008). When Cressey (1953) categorises non-sharable pressure as one of the Fraud Triangle (Cressey, 1953) factors, he recognised greed as a component of 'status gaining' which means living beyond one's means. Following this, other scholars also relate greed as one of the pressure components (Albrecht et al., 2008, 2010; Kassem & Higson, 2012). Greed has also been recognised as an example of attitude that drives executive or non-executive directors to manipulate PLC's profit for better financial performance.

Ignorance can stifle learning, as an ignorant person believes that they are not ignorant. Kruger and Dunning (1999) elucidate ignorance situation as a person who falsely believes that he or she is knowledgeable and will not seek out clarification of his or her beliefs, but rather rely on his or her position. As a result, this person may also reject valid but contrary information, neither realising its importance nor understanding it (Kruger & Dunning, 1999). Ignorance consists of the absence or distortion of true knowledge (Smithson, 1985). A research conducted by Schwartz (2001) on the nature of the relationship between corporate codes of ethics and behaviour among employees, managers, and ethics officers at four large Canadian companies shows that ignorance is one of the reasons of non-compliance with the corporate codes. Ignorance is associated to

'never aware', 'did not perceive' and 'forgot' (Schwartz, 2001). Thus, ignorance is a factor that can lead to FFR, including among executive or non-executive directors in Malaysian PLCs. Fraudsters may manipulate financial reporting to their advantages, based on their confidence that such executive or non-executive directors will not conduct a thorough check on the financial statements.

Research studies in psychology define determination as a positive emotion that involves persevering towards a difficult goal in spite of obstacles (Smith, 1991; Kirby et al., 2014). These studies have also confirmed that determination is not just a cognitive state of attitude, but rather an emotion that drives the affective state (Clare et al., 1987). Based on these statements, this research suggests that determination has a powerful effect on a fraudsters' mind from a negative emotion rather than positive emotion. Determination can motivate them to commit FFR although other fraud-risk factors (i.e. incentive, pressure, opportunity, rationalisation, capability/competence and arrogance) are well-controlled by a particular PLC. This phenomenon is best described in the field of emotion research, which is heavily focused on negative emotions and the action tendencies that they encourage (Fredrickson, 1998). Thus, there is a possibility that determination could become one of the fraud-risk factors in the Malaysian context. However, this research finds that determination is unlikely to be measured due to its subjectivity nature. Financial and non-financial data in annual reports do not provide suitable proxies to measure determination, particularly for quantitative analysis. Therefore, it is not within the scope of this research to examine determination.

This research has also found a new proxy that can be used to measure arrogance among CEOs in Malaysian PLCs. The new proxy is represented by how frequent pictures of CEOs in Malaysian PLCs are being included in annual reports. The idea in introducing this proxy came through observation on Malaysian PLCs annual reports and also the emphasising of the CEO's role as the main character in Malaysian PLCs. Although this indication (i.e. number of CEO's picture in annual report) is simple, it is believed that it could be one of the significant proxies for the hypotheses of this research, specifically to measure arrogance. Nevertheless, these pictures show the way of CEO in Malaysian PLCs to gain publicity and treat themselves as celebrity, which has been explained by Crowe (2011).

Greed, ignorance and determination can be emphasised as separate fraud-risk factors from attitude if these factors can cause huge influences to commit FFR among Malaysian PLCs. However, FFR could not possibly happen without opportunity. Wells (2001) suggests that fraud (in this research is referred to as 'FFR') does not occur in isolation. All crimes, including FFR are a combination of motive and opportunity (Wells, 2001). Thus, greed and determination are being viewed as motives for fraudsters, while ignorance creates opportunity to commit fraud. Opportunity can also being referred to as 'lack of internal control', where proper check and balance do not exist. Having connected these factors (pressure, opportunity and attitude) of the Fraud Triangle Model (Cressey, 1953), the co-existing relationships of greed, ignorance and determination between attitude and pressure must be in the existence of opportunity as illustrated in Figure 5.

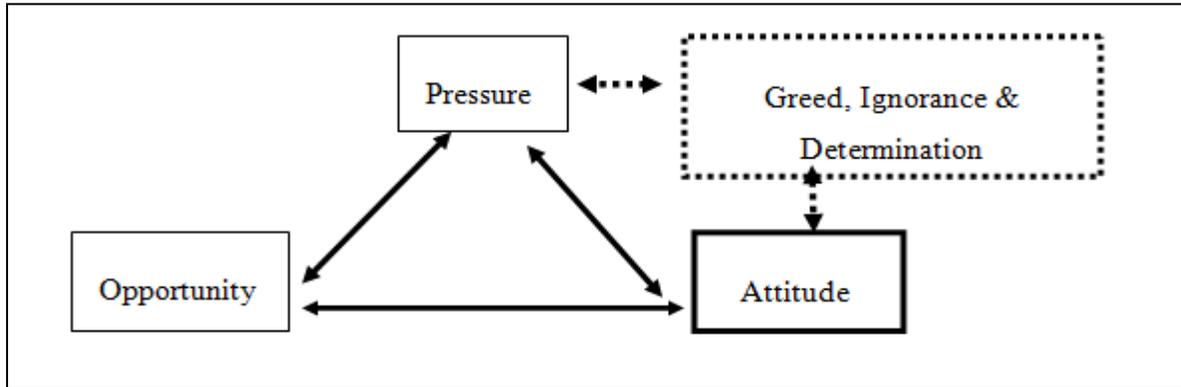


Figure 5: Co-exist Relationship of Greed, Ignorance and Determination between Pressure, Opportunity and Attitude (Source: Current Study).

### HYPOTHESES DEVELOPMENT

Thirteen hypotheses have been developed based on interview findings and previous literature that relates to the Fraud Models in a Malaysian context. Most of the literature use the Fraud Triangle Model (Cressey, 1953) in examining fraud-risk factors (Albrecht et al., 2004; Albrecht et al., 2008; Rae & Subramaniam, 2008; Skousen et al., 2009; Lou & Wang, 2011; Ravisankar et al., 2010; Dorminey et al., 2012; Tugas, 2012; Aghghaleh, 2014). This literature provide theoretical postulates on each of the fraud-risk factors; which are (1) incentive; (2) pressure; (3) opportunity; (4) attitude; (5) rationalisation; (6) capability/competence; and (7) arrogance. Research hypotheses are developed because there is no similar research study that tested the Fraud Triangle Model (Cressey 1953), Fraud Diamond Model (Wolfe & Hermanson, 2004) and Crowe’s Fraud Pentagon Model (Crowe, 2011) concurrently in the Malaysian context. Table 1 summarises hypotheses for this research.

<b>Hypothesis</b>	<b>Fraud-risk Factor</b>	<b>Fraud Models (Fraud Triangle – FT; Fraud Diamond – FD; Crowe’s Fraud Pentagon – FP)</b>	<b>Conformation of Proxy’s Suitability from Interview Findings</b>
H1: More personal financial incentive among Executive Directors that relates with PLCs’ performance indicate higher tendency towards the likelihood of FFR.	Incentive	FT, FD & FP	Yes
H2: High financial pressures on PLCs indicate higher tendency towards the likelihood of FFR.	Pressure	FT, FD & FP	Yes
H3: Less percentage of outside members (Independent Non-executive Directors) in BODs indicate higher tendency towards the likelihood of FFR.	Opportunity	FT, FD & FP	Yes
H4: High turnover frequency of HIA indicates higher tendency towards the likelihood of FFR.	Opportunity	FT, FD & FP	Yes
H5: High historical financial restatements times indicate higher tendency towards the likelihood of FFR.	Attitude	FT, FD & FP	Yes
H6: Frequent changes in PLCs’ accounting policies indicate higher tendency towards the likelihood of FFR.	Rationalisation	FT, FD & FP	Yes
H7: Undeclared policies on doubtful debts and account receivable indicate higher tendency towards the likelihood of FFR.	Capability/Competence	FD & FP	Yes
H8: Limited access on SPVs’ financial reports indicates higher tendency towards the likelihood of FFR.	Capability/Competence	FD & FP	Yes
H9: CEO duality indicates higher tendency towards the likelihood of FFR.	Arrogance	FP	Yes
H10: Politician who is also a CEO or President indicates higher tendency towards the likelihood of FFR.	Arrogance	FP	Yes

<b>Hypothesis</b>	<b>Fraud-risk Factor</b>	<b>Fraud Models (Fraud Triangle – FT; Fraud Diamond – FD; Crowe’s Fraud Pentagon – FP)</b>	<b>Conformation of Proxy’s Suitability from Interview Findings</b>
H11: Frequent number of CEO’s pictures in annual reports indicates higher tendency towards the likelihood of FFR.	Arrogance	FP	Yes
H12: Executive Directors’ remuneration that is based on PLCs’ financial performance indicates higher tendency towards the likelihood of FFR.	Greed	FT, FD & FP [Greed is being recognised as sub-component for pressure (Albrecht et al., 2008, 2010; Cressey, 1953; Kassem & Higson, 2012; Rae & Subramaniam, 2008)]	Yes
H13: Insufficient corporate governance courses for Executive and Non-executive Directors indicates higher tendency towards the likelihood of FFR.	Ignorance	Not Applicable	Yes

*Table 1: Hypotheses for the Research (Source: Current Study)*

**SAMPLE SELECTION**

Samples are selected based on Bursa Malaysia and SC’s classification of FFR-related cases into 5 categories, which are (1) False statements or information; (2) Misleading statements; (3) Combination of false statements/information and misleading statements; (4) Misleading appearance leading towards trading or stock’s price manipulation; and (5) Fail to comply with Asset Valuation Guidelines. Previous research studies that examine fraudulent and non-fraudulent Malaysian PLCs have adopted a maximum ratio of 2.5 on the sample size. For example, Dalnial et al. (2014) use 1 to 1 ratio when they match 65 fraudulent Malaysian PLCs to 65 non-fraudulent Malaysian PLCs. Aghghaleh et al. (2014) use 1 to 2.5 ratio when matching 40 fraudulent Malaysian PLCs to 100 non-fraudulent Malaysian PLCs. Therefore, this research aims to examine 160 samples consisting of 45 samples for fraudulent Malaysian PLCs and 115 samples of non-fraudulent Malaysian PLCs from Bursa Malaysia’s Main Market, using 1 to 2.5 ratio (1 fraudulent PLC: 2.5 non-fraudulent PLCs). The main reason is to get a larger, but measurable and controllable sample size of total population of Malaysian PLCs’ Main Market. In average, there are 763 PLCs on the Main Market from 2004 to 2013. Total population in the Main Market excludes 52 PLCs that relate to finance and Real Estate Investment Trusts (REITs) industry, which adopt different accounting policies and financial reporting requirements. Non-

fraudulent PLCs are matched based on year, assets size and industry within the period of research (Beasley, 1996). Based on this sample size, the research findings can be logically generalised.

**QUANTITATIVE ANALYSIS**

**1. Relationship between Dependent Variable and Independent Variables in this Research**

In statistics, the relationship between Dependent Variable (DV) and Independent Variable (IV) can be explained in a general formula for linear regression (Neter et al., 1996) as below:

Where:

$$Y = \beta_0 + \beta_1 X + \epsilon$$

Y = Dependent Variable;

X = Independent Variable;

$\beta_0, \beta_1$  = Estimated parameter; and

$\epsilon$  = Error, which indicates that an exact relationship does not exist between X and Y.

Based on these hypotheses, the following formula is established for this research.

$$\text{FRAUD} = \beta_0 + \beta_1 \text{GROWTH} + \beta_2 \text{LEV} + \beta_3 \text{COMBODs} + \beta_4 \Delta\text{HIA} + \beta_5 \text{HFRTs} + \beta_6 \Delta\text{ACCPOL} + \beta_7 \text{UNDPOL} + \beta_8 \text{SPVACC} + \beta_9 \text{CEODUAL} + \beta_{10} \text{POLCEO} + \beta_{11} \text{CEOPIC} + \beta_{12} \text{EXREMU} + \beta_{13} \text{INEDU} + \epsilon$$

Variable (Fraud) and Independent Variables (fraud-risk factors from the Fraud Models and interview findings).

<b>Proxy for Dependent Variable (DV) &amp; Independent Variable (IV)</b>	<b>Unit of Measurement from Malaysian PLCs' Annual Reports</b>	<b>Hypothesis (Fraud-risk Factors from the Fraud Models and Interview Findings)</b>	<b>Explanation</b>
FRAUD (DV)	FFR related to Malaysian PLCs	H1 to H13	A dummy variable coded by '1' is used for Malaysian PLCs categorised by Bursa Malaysia and Securities Commission Malaysia (SC) as cases of FFR, and coded by '0' otherwise.
GROWTH	Growth= Operating Profit/Total Assets	H1 (Incentive)	A dummy variable coded by '1' is used to indicate growth rate greater than that of industry median, and coded by '0' otherwise.
LEV (IV)	Leverage = Total Debt/Total Equity	H2 (Pressure)	A dummy variable coded by '1' is used to indicate leverage rate greater than that of industry median, and coded by '0' otherwise.
COMBODs (IV)	Composition (in %) of Board of Directors (BODs) = Number of outside members (Independent Non-executive Directors)/Total number of BODs	H3 (Opportunity)	A dummy variable coded by '1' is used to indicate Malaysian PLCs that have lower percentage of Independent Non-executive Directors (35% and below), and coded by '0' otherwise. Minimum requirement for Independent Directors set by Bursa Malaysia is 1/3 (≈33.33%).
ΔHIA (IV)	Turnover on Head of Internal Auditor (HIA)	H4 (Opportunity)	Represents number of HIA switch within the research period (2004-2013).
HFRTs (IV)	Historical financial restatements times	H5 (Attitude)	Proxy represents number of historical financial restatements mandated by Bursa Malaysia within the research period (2004-2013).

Proxy for Dependent Variable (DV) & Independent Variable (IV)	Unit of Measurement from Malaysian PLCs' Annual Reports	Hypothesis (Fraud-risk Factors from the Fraud Models and Interview Findings)	Explanation
ΔACCPOL (IV)	Frequent changes in Malaysian PLCs' accounting policies	H6 (Rationalisation)	A dummy variable coded by '1' is used to indicate Malaysian PLCs that have frequent changes in accounting policies (more than 2 times within the research period) and coded by '0' otherwise.
UNDPOL (IV)	Undeclared policies on doubtful debts and account receivables	H7 (Capability/Competence)	Proxy represents Malaysian PLCs that have not declared policies on doubtful debts and account receivables within the research period.
SPVACC (IV)	Limited access on the Special Purpose Vehicles (SPVs') financial reports	H8 (Capability/Competence)	A dummy variable coded by '1' is used to indicate Malaysian PLCs that have SPVs, but limit the access of SPVs' financial reports to the public, and coded by '0' otherwise.
CEODUAL (IV)	A Chief Executive Officer (CEO) who has accumulation of titles as the CEO and chairman of BODs in the same PLC (also known as CEO Duality)	H9 (Arrogance)	A dummy variable coded by '1' is used to indicate Malaysian PLCs that practise CEO duality and coded by '0' otherwise.
POLCEO (IV)	A Politician who is also a CEO or President in Malaysian PLCs.	H10 (Arrogance)	A dummy variable coded by '1' is used to indicate Malaysian PLCs that have politician as a CEO or President and coded by '0' otherwise.

Proxy for Dependent Variable (DV) & Independent Variable (IV)	Unit of Measurement from Malaysian PLCs' Annual Reports	Hypothesis (Fraud-risk Factors from the Fraud Models and Interview Findings)	Explanation
CEOPIC (IV)	Frequent number of CEO's pictures in Malaysian PLCs' annual reports.	H11 (Arrogance)	Proxy represents frequency of the CEO's pictures (counted in numbers) in Malaysian PLCs' annual reports.
EXREMU (IV)	Executive Directors remuneration that is based on Malaysian PLCs' financial performance.	H12 (Greed)	A dummy variable coded by '1' is used to indicate remunerations greater than mean of other Malaysian PLCs' remuneration of the same industry, and coded by '0' otherwise.
INEDU (IV)	Insufficient corporate governance courses for Executive and Non-executive Directors in Malaysian PLCs = Number of Corporate Governance Courses/Total Number of BODs.	H13 (Ignorance)	Proxy represents insufficient corporate governance courses (in ratio as compared to total number of BODs) for Executive and Non-executive Directors among Malaysian PLCs.

Table 2: The Summary between DV and IVs' Relationship for the Research (Source: Current Study)

**2. Univariate and Multivariate Analysis**

This research expects that most IVs should be significantly related (or correlated) to DV (fraud), which will be indicated by IVs' coefficients below .25. Quantitative analysis will begin with Descriptive Statistic and Univariate analysis which consist of Wilcoxon test, Median non-parametric test and Spearman-rank correlation test. Then, Correlation coefficient analysis which presents the correlation matrix for DV and IVs will confirm whether most of the IVs are significantly related to fraud or not. Finally, Logistic Regression Model of Multivariate analysis will be used to measure the relationship between DV and IVs. Estimations of parameters, Wald chi-square, p-value, and goodness-of-fit statistics will be displayed for the logistic regression model.

## CONCLUSION

This research examines fraud-risk factors of the Fraud Models in order to indicate the likelihood of FFR among Malaysian PLCs. The outcome of this research will lead to plausible recommendations in prevention and detection of FFR among Malaysian PLCs.

These recommendations are not only important, but critically useful in providing academic evidence and contribution that support the likelihood of FFR risks assessment among Malaysian PLCs using Fraud Models (Fraud Triangle, Fraud Diamond and Crowe's Fraud Pentagon). The outcome will also contribute new perspectives on the examination of fraud-risk factors not only in Malaysia, but other countries that experiencing similar corporate governance culture. In addition, this research may suggest new measurable proxies and fraud-risk factors (i.e. greed and ignorance) as additional contributions to the existing factors. Ultimately, the research outcome can potentially be proposed to related Accounting and Auditing regulatory bodies if these new fraud-risk factors are proven to be significantly important in detecting the likelihood of FFR.

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