THE APPROPRIATENESS OF FRAUD TRIANGLE AND DIAMOND MODELS IN ASSESSING THE LIKELIHOOD OF FRAUDULENT FINANCIAL STATEMENTS- AN EMPIRICAL STUDY ON FIRMS LISTED IN THE EGYPTIAN STOCK EXCHANGE.

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ABSTRACT

This study aims to examine the difference of in the appropriateness of the Fraud Triangle Model and the Fraud Diamond model in assessing the likelihood Fraudulent Financial Statement. As a result of the increase of manager's desires toward maximizing their personal benefits on account of the benefits of other parties; they tend to follow unethical behavior, through committing fraud, which has a negative impact on the reliability of the information represented by the financial Statements. To restrict this unethical behavior some studies (Okoli and Izedonmi, 2014; Al-Nimer, 2015; Rahimi and Amini, 2015) pointed out to the possibility of relying on external audit process, particularly when it is of a good quality, because of its ability to prevent Fraud in the Financial Statements.

The Study uses Logistic Regression Model to investigate this relationship. The sample consists of 100 firms listed in the Egyptian stock exchange for in 2012. The likelihood of Fraudulent Financial Statement is measured by the integrated results of three models that detect fraud, which includes; Altman Z Score, P Score and Beneish M- Score. The results of Regression indicate significant difference between the degree of relevance of Fraud Diamond Model in assessing the likelihood Fraudulent Financial Statements, Compared to that of the Fraud Triangle Model, Despite the absence of significant effect of some factors of Fraud Diamond Model, the results reveal that the factors of Fraud Diamond Model are a good tool for assessing the likelihood Fraudulent Financial Statements in Egypt.

Keywords: Fraud Triangle Model, Fraud Diamond Model, Fraudulent Financial Statements, Altman Z score, P score, Beneish M- score.

1. INTRODUCTION

The financial statements are considered as a key tool to meet the accounting information needs of the stakeholders, they rely on this information to make their economic decisions, and to investigate the degree of companies' financial stability and growth. For the accounting information to be useful, they must be characterized by many qualitative characteristics, such as Faithful Representation (or what is known as the Reliability), because of the effect of this characteristic on decreasing level of information risk facing decision makers (Arens *et al*., 2014).

As a result of management's ability to exploit their authority, through intentionally misstating the financial statements, by committing fraud (Pustylnick, 2011; Bandyopadhyay *et al*., 2014; Mahama, 2015). The reliability of the information delivered by the financial statements was negatively affected. Which created a necessary need for an effective mechanism to be relied upon, to ensure the safety and integrity of the process of financial statements preparation and increasing reliability of information of the financial statements (Goodwin and Wu, 2015; Zaki, 2016). This matter has been supported by several studies (ELserafy, 2015; Zaki, 2016) in environment of the professional practice in Egypt.

In this regard, some studies (Sarwoko and Agoes, 2014; Saladrigues and Grano, 2014; Wudu, 2014; Birjandi et al., 2015; Caskey and Laux, 2015) reached to the possibility of depending on external audit, because of the presence of negative relation between External Audit Quality and the existence of fraud. Through planning and implementing of sufficient Audit procedures to detect and report cases of fraud, as well as implementing other additional audit procedures to ensure tracing all cases of fraud.

It is accepted that the achievement of the supervisory role of external audit depend on increasing its quality, and this quality depends on two elements; efficiency of the auditor, and his ability to detect material misstatements on one hand, and auditor independence, which enable him to report on those misstatements that have been discovered, on the other hand, in light of his commitment to the professional standards and the rules and ethics of the profession (Zaki, 2016) On the contrary, it is clear from the practical reality, that despite of the auditors' commitment to the requirements of professional standards and Publications, related to his professional responsibility regarding fraud prevention, cases of fraud in financial statements has increased. That goes to (Carcello and Hermanson, 2008; Tugas, 2012; Shelton, 2014; Abdullahi and Mansor, 2015; Yusof *et al*., 2015; Manurung and Harsika, 2015) to the low efficiency of auditors in evaluating the possible existence of fraud in financial statements. This leads to the necessity of expanding the scope of analytical procedures, to include the tools necessary, to predict the possible existence of fraud in the financial statements on performing the audit process. In this regard, some studies (Carcello and Hermanson, 2008; Tugas, 2012; Shelton, 2014; Abdullahi and

Mansor, 2015; Yusof *et al.,* 2015; Manurung and Harsika, 2015; Ruankaew, 2016) agreed on the possibility of depending on several models, that are based on the factors associated with committing fraud, such as; Fraud Triangle Model which depends on three factors. Firstly, the Incentive to commit fraud, that expresses the exposure of management to external or internal pressure, which forces them to achieve a certain level of the profits, whether legally or illegally. Secondly, the Opportunity that refers to appropriate environment to committing the fraud, as the existence of weaknesses in the internal control structure. Thirdly, the Rationalization which refers to the ability to justify committing fraud.

And as extension of Fraud Triangle Model, some studies (Ozkul and Pamukcu, 2012; Abdullahi and Mansor, 2015; Yusof *et al.,* 2015; Manurung and Harsika, 2015; Ruankaew, 2016) added a forth factor to the three factors in fraud triangle model, which is Capability, it refers to the skills and characteristics of the individuals, that enables them to commit fraud. To be known as Fraud Diamond Model.

However, some studies (Tugas, 2012; Gbegi and Adebisi, 2013) pointed out to the possibility of developing a Diamond model, through adding a fifth factor to the previous model, which is The External Regulatory, it refer to the extent of the existence of mechanisms to punish those who breakthrough the rules, which is known as Fraud pentagon Model.

The researcher concludes from the above that, in order to increase the confidence of stakeholders in the capital market, once again, and to reduce the immoral behavior of managers, made by committing fraud in the financial statements, the efficiency of auditors in predicting the possible existence of fraud in the financial statements should increase. Thus it will lead to increasing the quality of audit, revealed in its positive impact on restricting manager's ability to mislead the users of accounting information, through committing fraud. Consequently the question of this research revolves around the appropriateness of prediction models, especially fraud triangle model and fraud diamond model, in predicting the likelihood of the existence of fraud in financial statements of Companies listed in the Egyptian Stock Exchange (EGx). This will be verified theoretically and practically.

The research is based on the empirical methodology, to test the appropriateness of both fraud triangle model and fraud diamond model in predicting the likelihood fraudulent financial statement of firms. The population of the research is firms listed in the Egyptian stock exchange (EGx) in 2012. Listed companies were chosen because of the availability of information about it. The sample consists of 100 company that the researcher was able to access it's full financial reports, as well as excluding banks and financial institutions because of their different natures and the separate laws and regulations of it, also excluded any company whose financial reports

were prepared in other currency than the Egyptian pounds and any firm with incomplete financial reports.

The contribution of this research stems from addressing a contemporary research issue which is the degree of relevance of both; fraud triangle model and fraud diamond model to predict the likelihood of existence of fraud in the financial statements of firms, which increases the efficiency of auditors in detecting and reporting on the fraud, which is widely discussed in different developed environments affecting all participants of different capital markets. This research address the same topic but in an emerging capital market, in an Arab country, as that of Egypt as to my knowledge is not widely discussed. In addition to using Altman Z Score, P Score, Beneish M- Score as a measurement to classify firms as fraudulent or non- fraudulent firms, and predicting the likelihood of existence of fraud in the financial statements, through the factors of fraud triangle model and fraud diamond model, which it is not widely used measurement in emerging economies. It perfectly suits my study because of the weak legal system. As in the light of high prediction of the likelihood of existence of fraud, stakeholder's confidence in firms financial reports increase.

The empirical importance of this research stems from testing the appropriateness of using those models in Companies Listed in the Egyptian Stock Exchange. This leads to enriching the accounting literature in this field, and increases the awareness and understanding of auditors; on the importance of depending on the prediction model such as fraud triangle model and fraud diamond model as analytical procedure, to increases the prediction of the likelihood of existence of fraud. All that reflects positively on improving External Audit Quality and then financial statements quality, which is a vital role required from audit now in Egypt more than ever.

The remainder of this study is organized as follows; the second section is Back ground and theoretical framework that is the literature review of is what the relevance both of fraud triangle model and fraud diamond model to prediction with the likelihood the existence the fraud in the financial statements of firms and hypothesis formulation. The third section is Data and Methodology, the forth section presents the study results and discussion of this results, finally the fifth section provides the conclusions and recommendations.

Research problem:

As a result of the increase in cases of fraud in financial statements in the recent times which led to the breakdown of multiple companies in many countries and the loss of stakeholders' confidence in the capital market, that triggered the need to depend on prediction models, as analytical procedures, such as fraud triangle model and fraud diamond model, to increase the efficiency and the ability of auditors in predicting the likelihood of existence of fraud in the

financial statements, and then prevent committing fraud. This study aims to investigate the level of appropriateness of both; fraud triangle model and fraud diamond model to predicting the likelihood of existence of fraud in the financial statements of firms. Especially in environment of high uncertainty and emerging capital markets as in the Egyptian Stock Exchange.

Research objective:

The broad objective of the study is to test the relevance both of fraud triangle model and fraud diamond model to prediction with the likelihood of the existence the fraud in the financial statements in Egypt and to answer the following questions:

A. What is the professional responsibility of the auditor related fraud detection, and what is its scope?
B. How to classify financial statements into fraudulent financial statements and non-fraudulent financial statements?
C. How to use fraud triangle model and fraud diamond model in the predicting the likelihood of existence of fraud in the fraudulent financial statements?
D. Are there significant differences in the level of appropriateness of fraud triangle model and fraud diamond model, in the predicting the likelihood of existence of fraud in the fraudulent financial statements of the firms listed in the Egyptian Stock Exchange particularly?

2. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

2.1 The core of professional responsibility of the auditor related to the detection the fraud:

Fraud is considered one of main motivations for breakdown of companies and the exacerbation of financial scandals (Zaki, 2016), which led to loss of confidence of the stakeholders in the accounting information and consider to the financial statements as fraudulent (Tyokoso and Tesgba, 2015; Zaki, 2016).

While the concept of fraud emerges from considering it as one of the intentional illegal acts, which is done by breaking through the internal control structure of the company and the circumventing on laws to achieve personal benefit (Ali, 2011; Abdel latif, 2015; Zaki, 2016). The professional publications and previous studies agreed that Fraud is considered a material misstatement in the financial statements resulting from misleading financial statements and asset misappropriation (ISA No. 240; ISA No. 315; ISA No. 330; ISA No. 250; SAS No. 99; SAS No. 109; SAS No. 110; Ozkul and Pamukcu, 2012; Modugu *et al.,* 2012; Modugu and Anyaduba, 2013; Taheri *et al.,* 2014; Tyokoso and Tesgba, 2015; Zaki, 2016).

Also there are several fields for committing fraud as ; manipulations or modifications in accounting records, non-representation or the intentional omission of certain transactions, the wrong application of the accounting principles, and the false recording of daily transactions (ISA No. 240; Ozkul and Pamukcu, 2012; Taheri *et al.,* 2014; Zaki, 2016).

By analyzing the responsibility of auditors with regard to fraud, it is revealed that there is an agreement between the professional publications and previous literature (ISA No. 240; ISA No. 315; ISA No. 330; SAS No. 99; SAS No. 109; SAS No. 110; Aamir and Farooq, 2011; Ozkul and Pamukcu, 2012; Chui and Pike, 2013; Taheri *et al.,*2014; Saladrigues and Grano, 2014; Wudu, 2014; Sarwoko and Agoes, 2014; Aobdia *et al.,* 2015; Zaki, 2016) that the responsibility of auditor is to detect and report any fraud throughout their implementation the audit process.

For the auditor to fulfill his responsibility he must adhere to several requirements which includes; exercising professional skepticism, making discussions with the audit team, understanding the nature and environment of the company, performing analytical procedures, design and perform additional audit procedures in response to the risks, evaluating the audit evidence obtained, and inquiring the management and those responsible for governance to identify areas of committing fraud (ISA No. 240; ISA No. 315; ISA No. 330; SAS No. 99; SAS No. 109; SAS No. 110).

2.2 How to classify financial statements to fraudulent financial statements and non-fraudulent financial statements:

In this regard, some studies (Pustylnick, 2011; Fanceschetti and Koschtial, 2012; Nia, 2015; Mahama, 2015; Zaki, 2016) pointed out to the possibility of classifying financial statements to fraudulent financial statements and non- fraudulent financial statements, through some fraud detection prediction models, including , Altman Z- Score model, P score model, Beneish M- Score model. And those models are based on calculating of several ratios, to explain the reason and the possibility of a place to commit fraud in the financial statements.

To improve the accuracy of manipulations` prediction rate to 96.55% and accuracy of the classification of financial statements to fraudulent financial statements and non- fraudulent financial statements, the results of these models should be integrated (Pustylnick, 2011; Abdul Latif, 2015).The financial statements is considered fraudulent, if the results of any two models of those models indicated the presence fraud in this financial statements (Abdul Latif, 2015; Zaki, 2016). Following is review of those models according to (Pustylnick, 2011; Fanceschetti and Koschtial, 2012; Nia, 2015; Mahama, 2015; Zaki, 2016).

2.2.1 Altman Z- Score model:

This model is used to predict companies financial distress (Abdul Latif, 2015), which is considered an early warning for the possibility of manipulation (fraud), and a measurement to determine companies that are more likely to manipulate its` financial statements (Pustylnick, 2011; Nia, 2015; Mahama, 2015). **And (Z-Score) measured through the following formula:**

$$Z = 1.2*X1 + 1.4*X2 + 3.3*X3 + 0.6*X4 + 1.0*X5$$

X1= Working Capital ÷ Total Assets.

X2= Retained Earnings ÷ Total Assets.

X3= EBIT ÷ Total Assets.

X4= Market value of Equity ÷ Book value of Equity.

X5= Net Sales ÷ Total Assets.

Whereas Z scores represent financial distress in companies if its value is more than 2.99 then it means that company is not in financial distress and it is non- fraudulent financial statement, while if it`s value is less than 1.81 then it means that company is exposed to financial distress and it is fraudulent financial statement (Zaki, 2016).

2.2.2 P- Score Model:

This model is used to predict the possibility of manipulations in the financial statements through the manipulation of revenue and intangible assets, to verify the possible existence of fraud, we will estimate the value of ΔP and compare it with the value of ΔZ, if it is (ΔP> ΔZ) then it means possible existence of fraud in the financial statements (Pustylnick, 2011; Abdul Latif, 2015; Zaki, 2016). **And (P-Score) measured through the following formula:**

$$P = 1.2*X1 + 1.4*X2 + 3.3*X3 + 0.6*X4 + 1.0*X5$$

Where: X1= Shareholders Equity ÷ Total Assets, and (**X2, X3, X4, X5**) as previously. **And (ΔP, ΔZ)** measured through **the following formulas:**

$$\Delta P = \frac{P(t) - P(t-1)}{|P(t-1)|} \qquad \Delta Z = \frac{Z(t) - Z(t-1)}{|Z(t-1)|}$$

2.2.3 Beneish M- Score Model:

This model is used to predict of possibility of committing fraud by relying on (8) indices. They can also be relied on separately to determine the fields of committing fraud and classifying of companies as fraud committer in the case presence of two or more of these indicators (Abdel-Latif, 2015). Also integrating those indicators to estimate the value of (M) and determine the possibility of company to commit fraud. if its` value is (M > -2.22) then this means the possible existence of fraud in the financial statements (Fanceschetti and Koschtial, 2012; Mahama, 2015; Nia, 2015). **And (M) measured through the following formula:**

M= -4.84+ 0.920 DSRI+ 0.528 GMI+ 0.404 AQI+ 0.892 SGI+ 0.115 DEPI – 0.172

SGAI+ 4.679 TATA – 0.327 LVGI

These indicators can also be classified into two groups; the first group reflects the existence of manipulation in profits depending on its field, Whereas the second group reflects the company's willingness to get involved in profit manipulations (Mahama, 2015), Following is review of those indicators (Abdul Latif, 2015; Mahama, 2015; Nia, 2015; Zaki, 2016):

A). The First Group of Indicators:

☒ **Day Sales in Receivables Index (DSRI):**

This indicator compares between sales ratio in customer account in the current year and previous year, and if (DSRI> 1) that refers to the possibility of committing fraud through Overstatement in sales of the current year compared to the previous year, which may result from the presence of operations unusual like having sales at the end of the month, **and is calculated as follows:**

$$DSRI = \frac{Receivables(t)/Sales\ (t)}{Receivables(t-1)/\ Sales(t-1)}$$

☒ **Asset Quality Index (AQI):**

This indicator measures the quality of the asset by calculating the proportion of fixed assets to total intangible assets, and if (AQI> 1) that refers to decrease asset quality and then the possibility of manipulation of profits through increased intangible assets, **and is calculated as follows:**

$$AQI = \frac{[1 - Current\ assets(t) + PP\&E]/Total\ assets(t)}{[1 - Current\ assets(t-1) + PP\&E]/Total\ assets(t-1)}$$

⊠ **Depreciation Index (DEPI):**

This indicator compares between rate of depreciation of fixed assets PPE (buildings, equipment, ...) for the previous year compared to the current year, if (DEPI> 1) that refers to the possibility of committing fraud in profits by the slowdown in the depreciation of assets, and overestimated the useful life of the asset, **and is calculated as follows**:

$$DEPI = \frac{\text{Depreciation}(t-1)/(\text{Depreciation}(t-1) + \text{PP\&E}(t-1))}{\text{Depreciation}(t)/(\text{Depreciation}(t) + \text{PP\&E}(t))}$$

⊠ **Total Accruals to total Assets Index (TATA):**

This indicator measures the quality of the cash flows of the company, how far generated sales on a cash basis, and the greater the value of the ratio indicates that TATA to manipulate earnings, by increasing the optional benefits, **and is calculated as follows**:

$$TATA = \frac{\Delta Current\ asset(t) - \Delta Cash(t) - \Delta Current\ Liabilities(t) - \Delta Current\ Maturities\ of\ LTD(t)}{Total\ assets}$$
$$\frac{-\Delta\ Income\ tax\ payble(t) - \ Depreciation\ and\ amortization(t)}{Total\ assets}$$

B). The second Group of Indicators:

⊠ **Gross Margin Index (GMI):**

This indicator measures the percentage of the profit margin of the previous year to the current year, if (GMI> 1) that refers to the possibility that the company manipulated earnings, **and is calculated as follows:**

$$GMI = \frac{[Sales(t-1) - Cost\ of\ goods\ sold(t-1)]/Sales(t-1)}{[Sales(t) - Cost\ of\ goods\ sold(t)]/Sales(t)}$$

⊠ **Sales Growth Index (SGI):**

This indicator measures the growth in sales, if (SGI> 1) that refers to the possibility of committing fraud in profits, due to increased sales of the current year compared to the previous year, **and is calculated as follows:**

$$SGI = \frac{Sales(t)}{Sales(t-1)}$$

⊠ **Sale, General and Administrative Expenses Index (SGAI):**

This indicator measures the extent of change in the ratio Sale, General and Administrative Expenses to sales current year compared to the previous year,   if (SGAI<1) that refers to the possibility of fraud in profits by deferring expenses, **and is calculated as follows:**

$$SGAI = \frac{\text{sales, general, and administrative expense}(t)/Sales(t)}{\text{sales, general, and administrative expense}(t-1)/Sales(t-1)}$$

⊠ **Leverage Index (LVGI):**

This indicator measures the extent of the change in the ratio of total debt to total assets for the current year compared to the previous year, if (LVGI> 1) that refers to the possibility that the company cheated in the financial statements, **and is calculated as follows**:

$$LVGI = \frac{[LTD(t) + \text{current liabilities}(t)]/\text{Total assets}(t)}{[LTD(t-1) + \text{current liabilities}(t-1)]/\text{Total assets}(t-1)}$$

2.3 The usage of fraud Triangle model and fraud Diamond model in the prediction of the likelihood existence the fraud in the fraudulent financial statements:

As a result of the recurrence of cases of fraud in financial statements the importance of the need to focus on increasing the efficiency and capacity of auditors in detect and report on fraud have emerged, **in this regard,** some studies (Lou and Wang, 2009; APA, 2011; Dalnial *et al.,* 2014; Alao, 2016; Gisairo, 2016) pointed out the possibility of increasing the efficiency of auditors, by understanding and assessment of the factors leading to committing fraud, and relied upon in the prediction of the possible existence of fraud in the financial statements.

By focusing on these factors, several studies (Carcello and Hermanson, 2008; Tugas, 2012; Shelton, 2014; Abdullahi and Mansor, 2015; Yusof *et al.,* 2015; Ruankaew, 2016) pointed out the possibility of expressing these factors in several **key models represented in each of the following;** Fraud Triangle Model, Fraud Diamond Model, Fraud Pentagon Model. **The following** is a review of the how to use those models, especially fraud Triangle model and fraud Diamond model, in the prediction of the likelihood of existence of fraud in the fraudulent financial statements, **so as follows:**

2.3.1 The usage of Fraud Triangle Model in the prediction of the likelihood existence the fraud in the fraudulent financial statements:

As a result considering fraud as one of White- Collar Crime, that it is often committed by Chief Executive Officer through exploiting their authority to do illegal acts and to achieve benefits with and / or against the interest of the company (Aghghaleh *et al.,* 2014; ACFE, 2014; Yusof *et al.,* 2015; Gisairo, 2016; Alao, 2016; ACFE, 2016). **We can** interpret the commitment of fraud, as a crime, through the availability of three main factors, **included in;** the availability of motivation that causes the thoughts to commit fraud, the appropriate conditions to commit fraud, and the ability of the individual to justify committing fraud. **Which adopted** by Donald R Cressey, as one of the researchers in criminology, when submitting **Fraud Triangle Model** in 1953, as one of the first explanatory models of causal factors for committing fraud

Accordingly, some studies (Aghghaleh *et al.,* 2014; ACFE, 2014; Abdullahi and Mansor, 2015; Ruankaew, 2016; Gisairo, 2016; Alao, 2016; ACFE, 2016) **pointed out** that Fraud triangle model **includes** each of the; **Incentive**, which is the main cause to commit fraud, **The Opportunity,** that reflect the availability of the appropriate environment to commit fraud, and **The Rationalization**, which refers to the ability of the individual and his conviction to justify committing fraud.

By analyzing these factors, some studies (Carcello and Hermanson, 2008; Albrecht *et al.,* 2010; Gbegi and Adebisi, 2013; Manurung and Harsika, 2015; ACFE, 2016) agreed that the **Incentive** (Motivation) is consider one of the most influential factor to commit fraud, **that expresses** the exposure of management to external or internal pressure which forces them to achieve a certain level of the profits, whether legally or illegally.

It is clear from the analysis of **previous studies** (Sihombing, 2014; Aghghaleh *et al.,* 2014; ACFE, 2014; Manurung and Harsika, 2015; ACFE, 2016) that incentives or pressures ,can be possibly divided into two groups, **the first group** is **the pressures relating to perpetrators of fraud**, which can be divided into; **External Pressures** that included personal pressure, that the individual is facing due to life circumstances such as debt personal and family needs, **Internal Pressures** are the pressures imposed on an individual by the company such as low salaries and fear of job loss.

While, **The second group** is the **pressures related to the company**, which divided other being to; **External Pressures** as the existence of threats to ensure the company's survival in the market and the possibility of delisting from the stock exchange and the desire to meet their external debt, and **Internal Pressures**, such as the face of the company's a state of financial distress, low productivity and the need to report on the better performance than the real performance of the company.

In the same way, some studies (Tugas, 2012; Sihombing, 2014; Manurung and Hardika, 2015; Abdullahi and Mansor, 2015; ACFE, 2016) pointed out that committing fraud need the availability of the appropriate environment, which is known as opportunity, which consists of each; the weakness of the Internal Control Structure, the complexity of operations, the And the failure to prosecute the perpetrators of fraud. **Finally,** committing fraud depends on the values and beliefs of the individual, the internal conviction and his ability to justify committing the fraud, which is expressed on the justification, as the last factor in that model.

As a result of developments in the business environment and their reflection on the desire to improve and enhance the models used, (Gisairo, 2016; Alao, 2016) pointed to a model similar fraud Triangle model which is **Fraud Scale Model**, was provided by both Home and Romney in 1984.It is achieved through replacing the justification Factor with the Personal Integrity, which refers to the possibility of judging that a person committed fraud, by the extent of his integrity and his behavior and beliefs.

By analyzing Fraud Scale Model, researcher believes that personal integrity factor is not much different in its content from the justification factor in the Fraud Triangle Model, because an individual justifies committing fraud depending on his believes regarding the possibility of misstating financial statements without feeling any guilt, which it is based on his ethical behavior. Also the researcher points to the need not to insert the personal integrity factor rather than the justification factor, and to the sufficiency of the components of the fraud Triangle model to predict the possible existence of fraud.

With regard to the relative importance of the effectiveness of eliminating the components of fraud triangle model in preventing of fraud, (ACFE, 2014) pointed to the possibility of arranging the relative importance of these factors, beginning with fighting the incentives that may cause committing fraud, as one of the most efficient and effective factors in the fight against fraud, followed by the elimination of opportunities to commit fraud, and finally track the beliefs and justifications for individuals to commit fraud, to verify the possibility of existence of fraud. **Accordingly**, the researcher can illustrate the factors of the fraud triangle factors model and arrange them in terms of relative importance to the prevention of fraud, **as follows:**
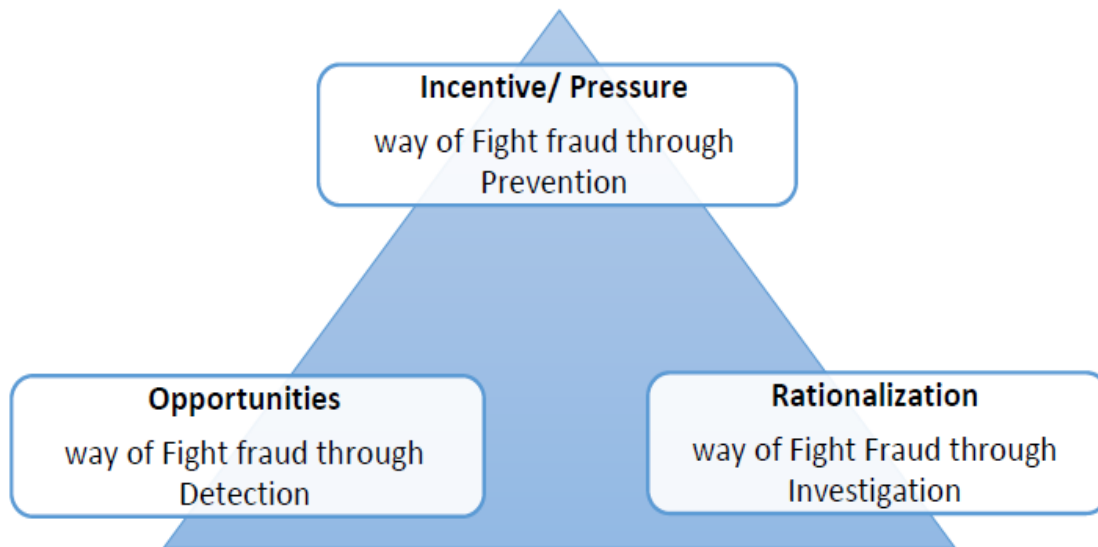
Figure 1: The Fraud Triangle Model

Based on the above, Researcher concludes that the decision to commit fraud depends on the interaction between the factors of the fraud triangle model, **and thus** can increase the ability of auditors to predict the possible existence of fraud in the fraudulent financial statements by assessing these factor, which is represented in both, the incentive and the opportunity and Rationalization.

2.3.2 The usage of Fraud Diamond Model in the prediction of the likelihood of existence of fraud in the fraudulent financial statements:

investigating the desire to improve and enhance the ability of auditors to predict the possible existence of fraud in the financial statements, some studies (David and Hermanson, 2004; Carcello and Hermanson, 2008; Gbegi and Adebisi, 2013; Shelton, 2014) pointed out that capabilities and features of the perpetrators of fraud should be considered, as one of the factors affecting the decision to commit fraud, **Which led** to the development of both Wolfe and Hermanson in 2004 fraud triangle model by adding a fourth factor, which is the Capability, and the appearance of what is known as **Fraud Diamond Model.**

An analysis of the factors of the Fraud Diamond model, several studies pointed (David and Hermanson, 2004; Carcello and Hermanson, 2008; Ozkul and Pamukcu, 2012; Abdullahi and Mansor, 2015; Yusof *et al.,* 2015; Manurung and Harsika, 2015; Ruankaew, 2016; Alao, 2016; Gisairo, 2016) to the lack of the differences in the characteristics and components between the first three factors (Incentive, Opportunity, Rationalization) of the Fraud Diamond model , and the

factors set forth above in the Fraud Triangle model. **As to the fourth factor, Capability,** pointed (Manurung and Harsika, 2015; Ruankaew, 2016; Alao, 2016; Gisairo, 2016) it defined as the characteristics and skills and distinctive features of the individual perpetrating fraud, which enables him to identify opportunities to commit fraud available to the company and exploit it.

On analyzing previous studies (David and Hermanson, 2004; Gbegi and Adebisi, 2013; Shelton, 2014; Abdullahi and Mansor, 2015; Yusof *et al.,* 2015; Ruankaew, 2016) it turns out, they agreed on the presence of six attributes or individual characteristics of perpetrators of fraud. Where **The** researcher can divide them into **two groups,** The **first group** is the **Position Characteristics** of the perpetrators of the fraud, secured to them by the company, Which includes both; **Authoritative Position** (Position Power) that reflect the individual's ability to utilize his job to take advantage of opportunities to commit fraud, **Immunity to Stress** that reflect the protection afforded to the management, which makes it able to continue to commit fraud, unchecked or unpunished.

While **the second group** is the **Personal Characteristics** of the perpetrator of the fraud, which includes all of; **Intelligent/ Experienced/ Creative Person** due to be regarded as the perpetrator of the fraud who has a high mental ability and experience, make it able to exploit the opportunities and weaknesses in his favor, **Strong Ego and great Confidence** where the perpetrator of the fraud has excess confidence in his abilities, **Coercion** which expresses the individual's ability to coerce others to participate in committing fraud, or hide the effects of fraud, for fear of being forced to leave work, and **Deceit** which refers to the ability of an individual to fabricate falsehoods to conceal a crime of committing fraud. **Accordingly,** the researcher can illustrate Fraud Diamond Model, **as follows:**
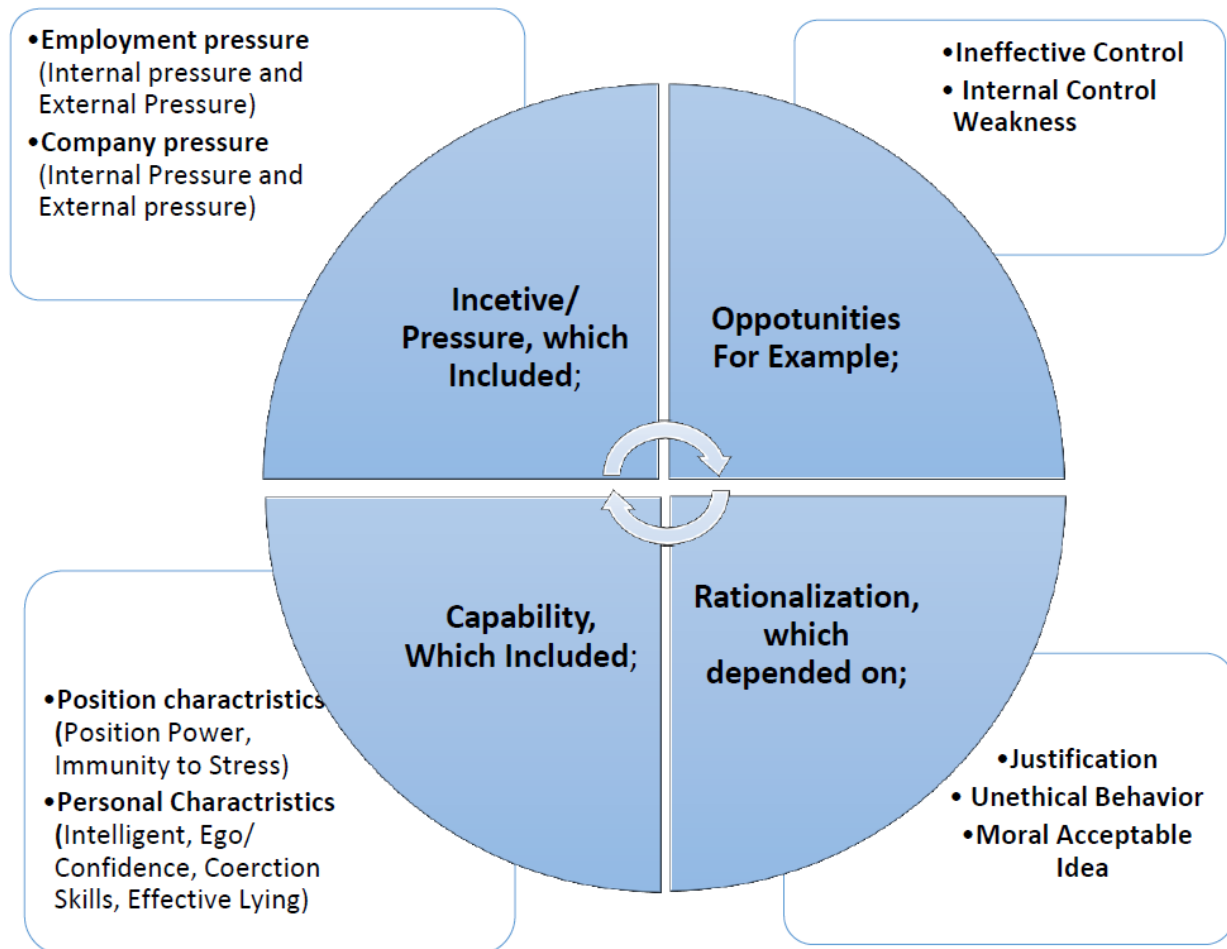
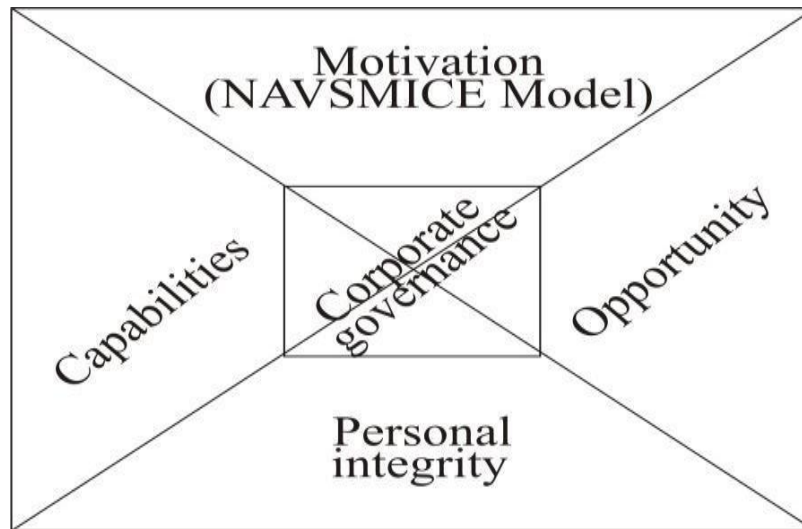**Figure 2: The Fraud diamond Model**

Also, (Gbegi and Adebisi, 2013) pointed to the possibility of developing the fraud Diamond Model by adding a new factor, which is corporate governance ,in addition to depending on the personal integrity factor. To form a model known as New Fraud Diamond Model, **The following is an explanation of this model**, according to a study (Gbegi and Adebisi, 2013):

2.4 Comparative analysis of the Appropriateness both of fraud Triangle model and fraud Diamond model in the prediction of likelihood of existence of fraud in the fraudulent financial statements and hypothesis development:

With regard to the appropriateness of both of fraud triangle model and fraud diamond model Illustrated , there was general agreement among many of the previous studies (Albrecht *et al.,* 2010; Tugas, 2012; Aghghaleh *et al.,* 2014; Sihombing, 2014; Manurung and Hardika, 2015; Abdullahi and Mansor, 2015; ACFE, 2016) on increasing the ability of auditors to predict the possibility of existence of fraudulent financial statements by relying on the assessment of the three factors of fraud triangle model. In addition to agreement (David and Hermanson, 2004; Carcello and Hermanson, 2008; Ozkul and Pamukcu, 2012; Abdullahi and Mansor, 2015; Yusof *et al.,* 2015; Manurung and Harsika, 2015; Ruankaew, 2016; Alao, 2016; Gisairo, 2016) on the possibility of improving the ability of auditors to predict the possible existence of fraud in the fraudulent financial statements, by evaluating the factors of the fraud Diamond model.

As well as, the professional publications (ISA No. 240; SAS No. 99) supported the need of auditors to assess the factors of the fraud triangle model to increase their ability to predict the possible existence of fraud in the fraudulent financial statements. These publications also pointed that auditors need to perform more analytical procedures to fulfill their professional liabilities regarding fraud detection and reporting Accordingly**, It is revealed from analyzing the previous publications**, that they overlooked the factor of ability, despite its importance in increasing the efficiency and ability of the auditor to predict the possible existence of fraud. This indicates that Professional Publications are somehow belated from keeping up with the

developments of the previous Academic Studies; also they overlooked the Fraud Diamond Model.

As for the significant differences between the degree of appropriateness of fraud triangle model and fraud diamond model, It emerges from an analysis of previous studies (David and Hermanson, 2004; Carcello and Hermanson, 2008; Ozkul and Pamukcu, 2012; Abdullahi and Mansor, 2015; Yusof *et al.,* 2015; Manurung and Harsika, 2015; Ruankaew, 2016; Alao, 2016; Gisairo, 2016) that no comparisons were made to determine which of the two models more are appropriate to the purpose of use. But the researcher believes that as (Abdullahi and Mansor, 2015; Yusof *et al.,* 2015; Manurung and Harsika, 2015; Ruankaew, 2016; Alao, 2016; Gisairo, 2016) pointed implicitly to the increase of the appropriateness of fraud diamond model due to including an extra factor, It **Could be argued** that assessing the factors of fraud diamond model , increases the ability of auditors to predict the possible existence of fraud in the fraudulent financial statements, compared to assessing the factors of fraud triangle model. **The research hypothesis can be derived as follows**:

H1: the usage of fraud Diamond model affect positively and at a greater degree, the prediction of the likelihood of existence of fraud in the fraudulent financial, compared to fraud Triangle model.

3. METHODS

The research is based on the empirical methodology, to test the difference in degree of appropriateness of both; fraud triangle model and fraud diamond model, to predicting the likelihood of existence of fraud in the financial statements of firms. Logistic Regression model is used. As it allows for testing the expected relationships between and among variables (Ozkul and Pamukcu, 2012; Abdullahi and Mansor, 2015; Yusof *et al.,* 2015; Manurung and Harsika, 2015; Ruankaew, 2016)

3.1 Population and Sample selection

The population of the research is firms listed in the Egyptian stock exchange in 2012. The sample consists of 100 industrial and trading company that the researcher was able to access it`s full financial reports. After screening several firms following the literature (Yusof *et al.,* 2015; Manurung and Harsika, 2015; Ruankaew, 2016) the sample excludes banks and other institutions because of their different natures and the separate laws they follow, also excluded any company whose financial reports were prepared in other currency than the Egyptian pounds and any firm with incomplete financial reports.

3.2 Measurement of Variables

3.2.1 The dependent variable: The prediction of the likelihood of fraud in the financial statements (F):

Fraud means material misstatement in the financial statements resulting from management preparing misleading financial statements to achieve their personal interests, from the employees' embezzlement of assets (SAS No. 99; SAS No. 109; SAS No. 110; ISA No. 240; ISA No. 250; Perols and Lougee, 2011; Franceschetti and Koschtial, 2012; Sarwoko and Agoes, 2014; Zaki, 2016).

As a result of the lack of a proper database to classify and identify companies committing fraud from other companies in Egypt, it is measured based on fraud detection prediction models, and integrating the results of three models, that included both of; Altman Z score, P score and Beneish M score, to improve accuracy of manipulations prediction rate to 96.55% (Pustylnick, 2011; Abdul Latif, 2015). **This variable** is measured by the extent of the ability of fraud model to interpret, detect or predict the existence of fraud in the actual fraudulent financial statements (Yusof *et al.,* 2014; Sihombing, 2014; Manurung and Hardiika, 2015)

3.2.2 The independent variable: Fraud Models; and measured through the application fraud Triangle model and fraud Diamond model as follows**:**

3.2.2.1 Fraud Triangle Model; It is one of the models that can be relied upon to verify the possibility of committing fraud in the fraudulent financial statements, through evaluating its factors (Incentive, Opportunity, Rationalization) associated with committing fraud (Manurung and Harsika, 2015; Ruankaew, 2016), **And which can be measured as follows:**

- **Incentive;** that expresses the exposure of management to external or internal pressure which forces them to achieve a certain level of the profits, whether legally or illegally (Yusof *et al.,* 2014; Sihombing, 2014; Manurung and Hardiika, 2015), **It measured through**; the **internal pressures** facing the company and which have been expressed, financial pressures, as measured by the rate of return on assets ROA, and the pressure on the financial stability as measured by the rate of growth in assets GROSS. the **external pressures** facing the company measured by leverage LEV, **As follows:**

$$\diamond \quad ROA = \frac{EBIT}{Assets\ (t)}$$

$$\diamond \quad GROSS = \frac{Assets\ (t) - Assets\ (t-1)}{Assets\ (t-1)}$$

$$\diamond \quad LEV = \frac{Total\ Debt\ (t)}{Total\ Assets\ (t)}$$

- **Opportunity;** Which is to the availability of the appropriate environment, such as the weakness of the Internal Control Structure (Yusof *et al.,* 2014; Sihombing, 2014; Manurung and Hardiika, 2015), **It measured through** Lack of effectiveness of the internal control structure, measured by a decrease the proportion of the number of independent members on the Board (INDE), and the nature of the industry measured by Day Sales in Receivable Index (DSRI), **As follows:**

❖ **INDE=** Ratio of Independent member of Board.

$$❖ \; DSRI = \frac{Receivables(t)/Sales\,(t)}{Receivables(t-1)/\,Sales(t-1)}$$

- **Rationalization;** which refers to the ability of the individual and his conviction to justify committing fraud (Yusof *et al.,* 2014; Sihombing, 2014; Manurung and Hardiika, 2015) **It measured** by Total Accruals to Total Assets index (Sihombing, 2014), **As follows:**

$$❖ \; TATA = \frac{\begin{array}{c}\Delta Current\;asset(t) - \Delta Cash(t) - \Delta Current\;Liabilities(t) - \Delta Current\;Maturities\;of\;LTD(t)\\ -\Delta\,Income\;tax\;payble(t) - \;Depreciation\;and\;amortization(t)\end{array}}{Total\;assets}$$

3.2.2.2 Fraud Diamond Model; it is developing to fraud triangle model, it depends on three factors referred to above and the Capability factor(Abdullahi and Mansor, 2015; Yusof *et al.,* 2015; Manurung and Harsika, 2015; Ruankaew, 2016), **It has been measured as follows:**

- **Incentive;** it has been measured previously, as in item (3.2.2.1).

- **Opportunity;** it has been measured previously, as in item (3.2.2.1).

- **Rationalization;** it has been measured previously, as in item (3.2.2.1).

- **Capability;** it is the characteristics and skills of individual and distinctive features of the perpetrator of the fraud, which enables it to identify opportunities to commit fraud available to the company and exploit it. **It is measured through** Changes in the Board of Directors, as Dummy variable taking the value (1) in the event of changes in the Board of Directors and takes the value (0) Other (Manurung and Hardika, 2015).

3.3 Data collection and Analysis

The data used in this study is secondary data, collected from the actual financial reports of the companies, published in their official websites. Market prices of stocks are collected from the data of Egyptian stock exchange. The financial report includes the financial statements. Financial

ratios and models used were calculated. Then emptying the data in Microsoft excel sheet in preparation of analyzing it using SPSS to test the research hypothesis.

3.4 Statistical methods used in data analysis and model selection

Logistic Regression Model was used to test the appropriateness of both of fraud triangle model and fraud diamond model in predicting the likelihood of existence of fraud in the financial statements of firms (Yusof *et al.,* 2015). The Logistic Regression formula is the same used in the study of (Aghghaleh *et al*., 2014; Yusof *et al.,* 2015) but with minor adjustments to suit the variables in study, **As Follows:**

- **Fraud Triangle Model:**

$$Ft = \beta0 + \beta1ROAt + \beta2GROSS + \beta3\ LEVt + \beta4INDEt + \beta5DSRIt + \beta6TATAt + \varepsilon\ t$$

Where; F = Prediction of the Likelihood of existence of fraud in financial statements, β0=Intercept, β1-6 = Coefficient of the independent variables, ROA = return on assets, GROSS= growth in assets, LEV = Leverage, INDE= Ratio of Independent member of Board, DSRI= Day Sales in Receivable Index, TATA= Total Accruals to Total Assets index, ε = error term, t = year.

- **Fraud Diamond Model:**

$$Ft = \beta0 + \beta1ROAt + \beta2GROSS + \beta3\ LEVt + \beta4INDEt + \beta5DSRIt + \beta6TATAt + \beta7Change + \varepsilon\ t$$

Where; (F, β0, β1-7, ROA, GROSS, LEV, INDE, DSR, TATA, ε , t) as referred to previously, Change= Changes in the Board of Directors.

4. RESULTS AND DISCUSSIONS

4.1 Results:

Table (1): Descriptive Statistics for Factors from the Fraud Triangle and the Fraud Diamond:

Variable:		Financial Statement	
Incentive:		**Fraud (N=60)**	**Non (N=40)**
ROA	Mean	0.828	0.830
	Median	0.400	0.083
	Std.D	0.1577	0.894
Gross	Mean	0.1073	0.077
	Median	0.0225	0.077
	Std.D	0.213	0.148
LEV	Mean	0.4588	0.286
	Median	0.433	0.286
	Std.d	0.299	0.2050
Opportunity:			
INDE	Mean	0.766	0.875
	Median	0.800	0.760
	Std.D	0.426	0.334
DSRI	Mean	1.233	1.093
	Median	1.00	1.00
	Std.D	1.169	0.513
Rationalization:			
TATA	Mean	0.08	0.117
	Median	1.034	1.120
	Std.D	0.255	0.339
Capability:			
Change	Mean	0.40	0.225
	Median	0.00	0.00
	Std.D	0.494	0.422

Table (1) provides the descriptive statistics for all variables in the study. The number of companies investigated in this study is 100 observations, which is divided into (60) fraudulent financial statement and (40) non-fraudulent financial statement. **The Analysis of this previous results** shows, that the decrease in the Mean value of (Gross, TATA) than its Std. Deviation, by a lower percentage in the group of fraudulent financial statement compared to the decrease in the group of non- fraudulent financial statement, implies the presence of volatility and Anomalous values in Audit quality variable (Nashwan, 2005).

As well as increasing in the Mean value of (ROA, LEV, DSRI) than its Std. Deviation, by a greater percentage in the group of fraudulent financial statement compared to the decrease in the group of non- fraudulent financial statement, this implies the lack of volatility and Anomalous values in Audit quality variable (Nashwan, 2005; Abdel Fatah *et al.,*2009).

Table (2): The Sig of for Factors from the Fraud Triangle and the Fraud Diamond:

Variable	Fraud Triangle Model (FT)				Fraud Diamond Model (FD)			
	B	Wald	Sig	EXP(B)	B	Wald	Sig	EXP (B)
ROA	-0.320	0.027	0.869	0.726	-0.53	0.070	0.791	0.591
GROSS	1.189	0.932	0.334	3.284	1.64	1.676	0.195	5.158
LEV	3.267	10.38	0.001	26.24	3.43	10.71	0.001	30.9
DSRI	0.118	0.212	0.645	1.125	0.073	0.078	0.779	1.076
INDE	0.855	1.944	0.163	2.352	1.017	2.549	0.110	2.765
TATA	-0.85	0.759	0.384	0.4251	-1.19	1.402	0.236	0.303
Change	—	—	—	—	-1.21	5.257	0.022	0.299

In **Table (2)** the logistic regression analysis shows significant effect to both of (LEV, Change) on the independent variable, where (p-value 0.05), also there are no significant effect to (ROA, GROSS, INDE, DSRI, TATA) on the independent variable, where of Significance level (p-value 0.05 or 0.10) in light of application of fraud Diamond Model. While in light of application fraud triangle model shows there are no significant effect to (ROA, GROSS, INDE, DSRI, TATA) on the independent variable, as well as there is significant effect of (LEV) on the independent variable, where (p-value 0.05).

The additional analysis through EXP (B) of dependent variables, shows that in the light of the application of fraud triangle model LEV (reflecting the external pressure as an indicator of incentive) is considered one of the most important variables that help increase the predictability with the likelihood of existence the fraud in the financial statements about (26) twice, that means the increase in the leverage ratio by one unit lead to increases the likelihood of predicting the existence of fraud by (26) units.

While variable (LEV) is considered the most important variables that increase the possibility of fraud in the financial statements about (30) twice, and the next variable in order is the Change in the Board of Directors (representing Capability factor) about (70%), and in light of the application fraud diamond model.

Table (3) The Relevance of Fraud Triangle Model and Fraud Diamond Model:

	Fraud Triangle Model	**Fraud Diamond Model**
-2Log Likelihood	118.706	112.988
Sig (Likelihood)	0.014	0.003
Cox and Snell Square	0.147	0.194
Nagelkerke R Square	0.199	0.263
Percentage Correct	66%	69%

In **Table (3)** shows the increase in the explanatory power of independent variables, in the light of the application fraud diamond model to explain the changes in the dependent variable, from (14.7%) to (19.4%) according to the coefficient of Cox and Snell Square as well as the increasing the coefficient Nagelkerke R Square from (19.9%) to (26.3%), compared to the application fraud triangle model. Although it illustrated increasing Percentage Correct (number of correct predictions on the total number of sample correct) in the light of the application fraud diamond model from (66%) to (69%) compared to the fraud triangle model.

4.2 Discussion of the results:

The logistic regression analysis show insignificant effect for each of the independent variables (ROA, GROSS, INDE, DSRI, TATA), in the light of the application both of fraud triangle model and fraud diamond model, on the prediction of the likelihood of existence of fraud in the fraudulent financial statement. This is in addition to the significant effect for the variable of (LEV) in the light of application of both; fraud triangle model and fraud diamond model, As well as the significant effect for the variable of (Change) in the light of the application fraud diamond model. These results are different from several studies in the previous literature (Lou and Wang, 2009; Aghghaleh *et al.,* 2014; Shelton, 2014; Yusof *et al.,* 2015; Gisairo, 2016), but it agrees with (Shelton, 2014; Gisairo, 2016) with regard to the significant effect for the variables of (LEV, Change). This difference in the results is related to the environment of professional

practice in the emerging counties such as Egypt, and the absence professional regulating bodies of the audit profession in such countries.

In the same way, the results show the increase in the explanatory power of the independent variables of fraud diamond model compared to fraud triangle model, from (14.7%) to (19.4%) according to the coefficient of Cox and Snell Square as well as the increasing the coefficient Nagelkerke R Square from (19.9%) to (26.3%), as well as increasing Percentage Correct of fraud diamond model to (69%). It theoretically agrees with (David and Hermanson, 2004; Gbegi and Adebisi, 2013; Shelton, 2014).

Accordingly, it is clear that the depending on the factors of fraud diamond model leads to increase the ability of auditors to predict the likelihood of existence fraud in the fraudulent financial statements, as a result of the significant effect of capability factor, that is measured by the variable (Change).this variable is the reason behind increasing both; the proportion of explanatory power and the percentage of correct classification of the fraud diamond model compared to fraud triangle model. These results can be traced back to the variable (Change).

This refers to increase of the appropriateness of fraud diamond model, compared to fraud triangle model, in increasing the ability of auditors to predict the likelihood of existence of fraud in the financial statements, these results agrees with (Gbegi and Adebisi, 2013; Shelton, 2014). As a result of lack of the significant affect for all variables of fraud diamond model, especially; (ROA, GROSS, INDE, DSRI, TATA) therefor the research hypothesis is accepted partially. The partial acceptance of the research hypothesis is related to the environment of professional practice in the emerging counties such as Egypt, where legal systems is weak and no proper sanctions applied on the violators..

5. CONCLUSIONS AND RECOMMENDATIONS

Conclusions:

The researcher concludes from the foregoing results; firstly with regard to Fraud, it is considered one of main motivations for the breakdown of companies and the exacerbation of financial Scandals, it can be defined as material misstatement in the financial statements, resulting from misleading financial statements prepared by management to achieve their personal interests, or the employees of embezzlement of assets. Also there are several major motivations for committing fraud such as; financial pressures, weakness of internal control structure and the ineffectiveness mechanisms of corporate governance. Fraud fields can be summarized as follows; manipulations or modifications in accounting records, non-representation or the intentional omission of certain transactions, the wrong application of the accounting principles.

Also classifying financial statements of firms to fraudulent financial statements and non-fraudulent financial statements, can be achieved through depending on some fraud prediction detection models, that based on the calculation of several ratios, to explain the reason and the possibility of a place to commit fraud in the financial statements, and it included; Altman Z-Score model, P score model, Beneish M- Score model.

By analyzing the responsibility of auditors with regard to the fraud, it revealed that there is an agreement between the professional publications and previous literature that the responsibility of auditor is to detect and report any fraud throughout their implementation of the audit process, through complying with several requirements as; exercising professional skepticism, discussions with the audit team, understanding the nature and environment of the company, the performance of analytical procedures, the design and performance of additional audit procedures response to the risk, and evaluation of audit evidence obtained.

To increase the ability of auditors to predict the likelihood of existence of fraud in the fraudulent financial statements, we can depend on the assessment the factors of fraud Triangle, which includes incentive and opportunity and rationalization, in addition to supporting the ability of auditors, by assessing the capability factor, through depending on fraud diamond model.

Finally By analyzing the previous literature, it is illustrated that fraud diamond model is more appropriate in predicting the likelihood of existence fraud in the fraudulent financial statements compared to fraud triangle model, and that there are significant differences in the effect of all factors of fraud diamond model compared to all factors of fraud triangle model, while the empirical result of this research shows lack of the significant effect of some variables of fraud diamond model. This contradicted results, stems from the environment of the study where Egypt suffers from several defects in the environment of professional practice, as the absence of professional regulating bodies to supervise the work of the auditors and the quality of the audit process.

Recommendations:

The importance of the existence professional regulating bodies for the audit profession in Egypt, in order to activate the legal responsibility of auditors with both its types of criminal and civil responsibility. And also auditors' Professional and social responsibility. The necessity of de-listing companies from Egyptian Stock Exchange, when the auditors detect cases of fraud.

The importance of the availability of a database updated annually with Egyptian Financial Supervisory Authority (FSA), which includes the classification of the fraudulent companies and Non- fraudulent companies like global stock markets. Audit firms must train its auditors on the use of Decision Support tools, specially Fraud Models and the Mathematical models, when

detecting fraud in the financial statements. Egypt must support FSA role in monitoring on Audit Firms Quality and listed companies in Egypt.

REFERENCES

Aamir, S., and U. Farooq. (2011). **Auditor Client relationship and audit Quality- the effects of long- term auditor client relationship on audit quality in SMEs.** Published thesis in Partial Fulfillment of the Requirements for the Degree of Master in Accounting, Umea School of Business, Umea University.

Abdullahi, R., and N. Mansor. (2015). Fraud Triangle Theory and Fraud Diamond Theory Understanding the Convergent and Divergent for Future Research. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 5(4): 38-45.

Abdel Fatah, M. N., A. Abdel EL Menaim, A. EL zahaby, S. M. Momhamed. 2009. **The Depth analysis of the data with using SPSS.** Available at: *www.google.com*.

Abdul latif, D. H. E. (2015). The effect of the External Auditor is uses to the Data Mining methods on the effectiveness of the detection and reporting about the fraud in the financial statements- an Empirical study on the private sector in Egypt. Unpublished PHD Degree in Accounting, Accounting Department, Faculty of Commerce, Alexandria University.

Aghghaleh, S. F., T. M. Iskandar, and Z. M. Mohamed. (2014). Fraud Risk Factors of fraud Triangle and the Likelihood of fraud Occurrence: Evidence from Malaysia. *Information Management and Business Review* 6(1): 1-7.

Alao, A. A. (2016). Analysis of Fraud in Banks: Evidence from Nigeria. *International Journal of Innovative Finance and Economics Research* 4(2): 16-25.

Albrecht, C., C. Turnbull, Y. Zhang, and C. J. Skousen. (2010). The Relationship between South Korean Cabals and Fraud. *Management Research Review* 33(3): 257-268.

Ali, A. E. N. (2011). Encyclopedia of the Modern External Audit. El Dare El Gameya-Alexandria.

Al- Nimer, M. 2015. Factors Affecting Mandatory Audit Rotation: Evidence from Jordan.

International Journal of Economics and Finance 7(6): 51-59.

American Institute of Certified Public Accountants (AICPA). (2002). Consideration of Fraud in a Financial Statement Audit. Statements on Auditing Standards No. 99 AU Section 316 Available at: *www.aicpa.org*.

_____. (2006). Performing Audit Procedures in Response to Assessed Risks and Evaluating the Audit Evidence Obtained. Statements on Auditing Standards No. 110 AU Section 318 Available at: *www.aicpa.org*.

_____. (2006). Understanding the Entity and its Environment and assessing the Risks of Material Misstatement. Statements on Auditing Standards No. 109 AU Section 314   Available at: *www.aicpa.org*.

Aobdia, D., C. J. Lin, and R. Petacchi. (2015). Capital Market Consequences of Audit Partner Quality. *The Accounting Review,* 90(6): 2143-2176.

Arens, A. A., R. J. Elder, and M. S. Beasley. 2014. **Auditing and Assurance Services: An Integrated Approach 14**[th] **Edition**. Upper Saddle River, NJ: Prentice- Hall.

Association of Cerrtified Fraud Examiners (ACFE). (2016). **Fighting Fraud in the Government.** Global Headquarters, the Gregor Building, West Ave, Austin, USA.

_____. (2014). **Iconic Fraud Triangle endures.** Global Headquarters, the Gregor Building, West Ave, Austin, USA.

Auditor of Public Accounts (APA). (2011). **The   Fraud   Triangle.**   Available at: *www.apa.virginia.gov*.

Bandyopadhyay, S. P., C. Chen, and Y. Yu. (2014). Mandatory Audit Partner Rotation, Audit Market Concentration, and Audit Quality: Evidence from China. *Advances in Accounting* 30(1): 18-31.

Birjandi, H., M. H. Kaveh, and M. S. Khorrami. (2015). The Effect of Audit Quality Adjustment on the Relationship between Earnings Management and Return on Equity in Listed Companies in Tehran Stock Exchange. *Research Journal of Finance and Accounting* 6(11): 25- 37.

Carceloo, J. V., and D. R. Hermanson. (2008). Fraudulent financial reporting: how do we close the knowledge Gap?. Available at: *http://www.theifp.org*.

Caskey, J., and V. Laux. (2015). Corporate Governance, Accounting Conservatism, and Manipulation. Available at: *http://ssrn.com*.

Chui. L., and B. Pike. (2013). Auditors' responsibility for fraud detection: New wine in old bottles?. *Journal of Forensic & Investigative Accounting* 5 (1): 204-233.

Dalnial, H., A. Kamaluddih, Z. M. Sanusi, and S. Khairuddin. (2014). Detecting Fraudulent Financial Reporting through Financial Statement Analysis. *Journal of Advanced Management Science* 2(1): 17- 22.

David, T. W., and D. R. Hermanson. 2004. The Fraud Diamond: Considering the Four Elements of Fraud. *The CPA Journal* 38- 42.

ELserafy, A. A. (2015). **The effect of the fulfillment of company's Social Responsibility and level of Ethics Commitment of the Financial Accounting on the Quality of Financial Reporting- an Empirical Study on companies listed on the Egyptian Stock.** Unpublished thesis PHD in Accounting, Accounting Department, Faculty of Commerce, Damanhour University.

Franceschetti, B. M., and C. Koschtial. (2012). Do bankrupt Companies manipulate earnings more than the non-bankrupt ones?. Available at: *http://www.aabri.com*.

Gbegi, D. O., and F. J. Adebisi. (2013). The new Fraud Diamond Model- How can it help Forensic Accountants Fraud Investigation in Nigeria?. *European Journal of Accounting Auditing and Finance Research* 1(4): 129-138.

Gisairo, B. (2016). **Effectiveness of use of Biometric Technology to Curb Fraud in Medical Insurance Firms in Kenya.** A Research Project Submitted in Partial Fulfillment of the requirement for the Degree of Master of Science in Finance, School of Business, University of Nairobi.

Goodwin, J., and D. Wu. (2015). What is the Relationship Between Audit Partner Busyness and Audit Quality?. *Contemporary Accounting Research*, forthcoming.

International Auditing and Assurance Standard Board (IAASB). (2009). **The Auditor's Responsibilities relating to Fraud in an audit of Financial Statements.** International Standard on Auditing No. 240. IAASB. Available at: *www.ifac.org*.

_____. (2009). **Identifying and Assessing The Risks of Material Misstatement Through Understanding The Entity and Its Environment.** International Standard on Auditing No. 315. IAASB. Available at: *www.ifac.org*

_____. (2009). **The Auditor's Procedures in Response to Assessed Risks**. International Standard on Auditing No. 330. IAASB. Available at: *www.ifac.org*.

_____. (2009). **Consideration of Laws and Regulations in an audit of Financial Statement.** International Standard on Auditing No. 250. IAASB**.** Available at: *www.ifac.org*

Lou, Y. I., and M. L. Wang. (2009). Fraud Risk Factor of the Fraud Triangle Assessing the Likelihood of Fraudulent Financial Reporting. *Journal of Business & Economics Research* 7(2): 61- 78.

Mahama, M. (2015). Detecting Corporate Fraud and Financial Distress using the Altman and Beneish Models the Case of Enron Coro. *International Journal of Economics, Commerce and Management* III(1): 1-18.

Manurung, D. T. H., and A. L. Hardika. (2015). Analysis of factors that influence financial statement fraud in the perspective fraud diamond: Empirical study on banking companies listed on the Indonesia Stock Exchange year 2012 to 2014**. Working paper**, International Conference on Accounting Studies (ICAS) 17-20 August, Jokor Bahru, Johor, Malaysia.

Modugu, K. P., and D. J. O. Anyaduba. (2013). Forensic Accounting and Financial Fraud in Nigeria: An Empirical Approach. *International Journal of Business and Social Scinence* 4(7): 281-289.

Modugu, P. K., N. Ohonba, and F. Izedonmi. (2012). Challenges of Auditors and Audit Reporting in a Corrupt Environment. *Research Journal of Finance and Accounting* 3(5): 77-82.

Nashwan, E. (2005). **Scientific Evidence of the Application Statistics.** Umm Al- Qura University. Available at: *www.google.com*.

Nia. S. H. (2015). Financial ratios between fraudulent and non- fraudulent firms: Evidence from Tehran Stock Exchamge. *Journal of Accounting and Taxation* 7(3): 38-44.

Okolie, A. O., F. O. I. Izedonmi, and A. O. Enofe. 2013. Audit Quality and Accrual- based Eanings Management of Quated Companies in Nigeria. *IOSR Journal of Economics and Finance* 2(2): 7-16.

Ozkul, F. U., and A. Pamukcu. (2012). Fraud Detection and Forensic Accounting. Available at: *http://wwwspringer.com*.

Perols, J., and B. A. Lougee. (2011). the Relation Earnings Management and Financial Statement Fraud. *Advances in Accounting, incorporating Advances in International Accounting* 27: 39-53

Pustylnick, I. (2011). Empirical Algorithm of Detection of Manipulation with Financial Statements. *Journal of Accounting, Finance and Economics* 1(2): 54-67.

Rahimi, G., and S. M. Amini. 2015. The Survey of the Relationship between Auditing Quality and the Profitability in the Companies Accepted in Tehran' s Exchance Market. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 5(2): 100-115.

Ruankaew, T. (2016). Beyond the Fraud Diamond. *International Journal of Business Management and Economic Research* 7(1): 474-476.

Saladrigues, R., and M. Grano. (2014). Audit Expectation Gap: Fraud Detection and other Factors. *European Accounting Management Review* 1(1): 120-142.

Sarwoko, I., and S. Agoes. (2014). An Empirical analysis of Auditor's industry Specialization, Auditor's Independence and Audit Procedures on audit quality: Evidence from Indonesia. *Procardia- Social and Behavioral Sciences* 164: 271-281.

Shelton, A. M. (2014). Analysis of Capabilities Attributed to the Fraud Diamond. Available at: *http://dc.etsu.edu/honors*.

Sihombing, K. S. 2014. Analisis Fraud Diamond Dalam Mendeteksi Financial Statement Fraud: Studi Empiris Pada Perusahaan Manufaktur Yang Terdaftar Di Bursa Efek Indonesia (BEI) Tahun 2010-2012. Available at: *www.google.com*

Taheri, M., M. Bahadori, and H. Kamrani. (2014). The Relationship between Audit Quality and Fraud in Listed Companies in Tehran Stock Exchange. *Academic Journal of Accounting and Economics Researches* 3(3): 269-277.

Tugas, F. C. (2012). Exploring a new Element of fraud: A study on selected financial accounting fraud cases in the world. *American International Journal of Contemporary Research* 2(6): 112- 121.

Tyokoso, G. M., and L. N. Tsegba. (2015). Audit Quality and Earnings Management of Listed Oil Marketing Companies in Nigeria. *European Journal of Business and Management* 7(29): 34- 42.

Wudu, A. (2014). **Auditor responsibility and fraud detection: in Ethiopian private audit firms.** Published Presented in Partial Fulfillment of the Requirements for the Degree of Master of Science, the Department of Accounting and Finance, Addis Ababa University.

Yusof, M. K., A. H. Ahmed Khair, and J. Simon. (2015). Fraudulent Financial Reporting: An Application of Fraud Models to Malaysian public Listed Companies. *The Macrotheme Review* 4(3): 126- 145.

Zaki, N. M. (2016). The relationship between audit quality and non-Fraudulent financial statements- An Empirical study on Companies Listed in the Egyptian Stock Exchange. *International Journal of Social Science and Economic Research* 1(11): 1930- 1952.