The usage of Fraud Hexagon Model to discover fraud in the Financial Statements

An Applied Study

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Abstract:

The research aims to use the Fraud Hexagon Model to improve the comprehension the main elements that cause fraud to occur. Fraud Hexagon Model is the expansion of Pentagon fraud model, fraud diamond and fraud triangle. The fraud Hexagon model adds collusion in addition to the other five existing factors namely pressure, opportunity, rationalization, Capability and External Regulatory. The population of this study was 41 companies recorded on the Egyptian Stock Exchange and have financial lawsuits for the period of 2019-2020. The samples consists of 10 companies were gotten by using a random sampling method. The occurrence of Fraud in the Financial Statement is measured by the Altman Z Score, due to shortage of database to assort companies committing fraud from other companies in Egypt. Data was examined by using logistic regression analysis. The results indicated that the major six element-collusion - plays an essential role in commit fraud. It is become clear that fraud Hexagon model is the most suitable model in detecting fraud, and there are important variances between the influence of all elements of fraud Hexagon model and fraud pentagon model.

- **Key words**: The fraud Hexagon model, Pressure, opportunity, Rationalization, Capability, External Regulatory, collusion, Financial Statement Fraud.

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الملخص:

الغرض من هذه الدراسه هو استخدام النموذج السداسي للغش لتحسين فهم العوامل التى تدفع لارتكاب الغش . يعتبر النموذج السداسي للغش إمتداد للنموذج الخماسي والرباعي والثلاثي للغش . حيث يضيف النموذج السداسي عامل التواطؤ الى العوامل الخمسه الموجوده في النموذج الخماسي وهم(الحافر ،الفرصه ،التبرير ،القدرة، الإطار القانوني واللائحى) يتكون مجتمع هذه الدراسه من 41 شركه مدرجه في البورصه المصريه ولديها دعاوى قضائيه ماليه في الفتره الزمنيه 2019- 2020. تتكون عينه الدراسه من 10 شركات تم الحصول عليها باستخدام تقنية أخذ العينات العشوائية. تم قياس احتماليه وجود الغش بالقوائم الماليه باستخدام نموذج Altman Z Score وذلك لعدم وجود قاعدة بيانات لتصنيف وتحديد الشركات المرتكبه لحالات الغش عن غيرها. تم تحليل البيانات باستخدام التحليل الإحصائي الوصفي وتحليل الانحدار اللوجستي . أشارت النتائج إلى أن العنصر السداسي - التواطؤ - يلعب دورًا حاسمًا في إجبار الناس على ارتكاب الغش . حيث يعتبر التواطؤ عنصر مركزي في كثير من جرائم الغش والجرائم المالية المعقدة والمكلفة. يتضح أن نموذج السداسي للغش أكثر ملاءمة في إكتشاف الغش في القوائم المالية مقارنة بنموذج الخماسي للغش ، وتوجد فروق ذات دلالة إحصائية بين تأثير كل عوامل الغش بالنموذج السداسي و النموذج الخماسي للغش.

ـ **الكلمات المفتاحية:** النموذج السداسي للغش، الحافر، الفرصة، التبرير، القدرة، الإطار القانوني واللائحى، التواطؤ، الغش بالقوائم المالية.

1. Introduction:

The financial statements become an important instrument in the operation of the company it helps to communicate financial information to stakeholders and related parties, where it is considered a final process in an accounting cycle, that reflects corporate condition within a given period and meet the accounting information needs.

Regarding to the recent report to the Nations on Occupational Fraud and Abuse (2018), published by (ACFE), involve information about fraud damages in the Asia-Pacific circumstances they analyzed, along with the ways of fraud committed, the methods in which the frauds were discovered, the features of the victim organizations and their anti-fraud controls, the report revealed that losses from fraud in financial reports equaled $700,000 and accounted for 13% of the cases in this region.

Thus, Fraud occur in the financial statements due to the incentive and inspiration of various parties, both from inside the company, and from outside the company. They do different ways to implement manipulation of financial statements.

This report created an essential requirement for an operational instrument to certify the security and reliability of the preparation of financial statements and growing reliability of information of the financial statements. This cause the need of growing the range of analytical procedures, such as models that explain why people commit fraud and improve our comprehension the main elements that lead to fraud occurrence in the financial statements, through assessing the factors (Pressure, opportunity, Rationalization, Capability, External Regulatory, collusion), and try to develop these models to adapt with current developments in the work environment.

2. Study Problem

Some companies use fraud to misrepresent their financial statements and to show their profits on the contrary for personal gain at the expense of the investor. These practices have led to the collapse of many large international companies such as Enron in 2001, WORLD COM in 2002 , Tyco International in 2002, Parmalat at the end of 2003, Toshiba in 2015 and Olympus Corporation in 2017 , due to the auditor's collusion with management in these practices or because the auditor failed to detect material misstatements.

Therefore, the research problem can be expressed in answering the following questions:

- What are the models ' developments which explain why people commit fraud?
- Are the six elements of fraud hexagon model can predict fraud in the financial statements?
- Is there an impact of the Fraud Hexagon model on improving the Audit of financial statements?

3. Study Importance

The importance of this study could be addressed through the following themes:

3.1: Scientific Importance:

The scientific importance of the research comes from increasing the efficiency of auditors to explain the reasons for fraud in the financial statements. Which is reflected in improving the external audit quality, and thus supporting the reliability of financial statements.

3.2: Practical Importance:

The practical importance of this research stems from using the Fraud Hexagon model for explaining why people commit fraud, and identify the main elements which play an essential role in answering the following question: whether fraud has been actually occurred?

4. Study Objectives

In view of the study problem and its importance, the main objective of the research is to use the Fraud Hexagon Model for clarifying why people commit fraud, and the effect of using the model on the quality of the audit by applying the research on a sample of Firms recorded in The Egyptian Stock Exchange. In order to achieve the research objective; the following three sub-objectives must be achieved:

a) Analyzing the evolution of fraud models.

b) Examining results of applying the Fraud Hexagon Model to ensure that fraud exists in the financial statements.

c) Improving the audit quality of financial statements by using the Fraud Hexagon Model.

5. Study Hypotheses

The main hypothesis H0: There is no statistically influence of using the fraud hexagon model on the prediction of the fraudulent financial statements.

This research experiential how six elements of fraud hexagon model, (i.e. pressures, opportunity, rationalization, capability, External Regulatory and collusion) effect on fraudulent Financial Statements. To accomplish this, hypotheses are as follows:

H0-1: There is no influence of Pressure on the prediction of the fraudulent financial statements.

H0-2: There is no influence of opportunity on the prediction of the fraudulent financial statements.

H0-3: There is no influence of Rationalization on the prediction of the fraudulent financial statements.

H0-4: There is no influence of Capability on the prediction of the fraudulent financial statements.

H0-5: There is no influence of External Regulatory on the prediction of the fraudulent financial statements.

H0-6: There is no influence of collusion on the prediction of the fraudulent financial statements.

6. Study Limitation

This study is limited to using the Fraud Hexagon Model to discover fraud in the Financial Statements, and thus the followings are beyond the scope of this study:

a) The effect of this model on defining the factors that lead to the occurrence of fraud.
b) The researcher will not apply other fraud models, and the study will not discuss the impact of Fraud Hexagon Model on audit process.

7. Study Methodology

To achieve the research's objectives both inductive and deductive approaches will be utilized, where inductive approach will be employed to review the previous theoretical and empirical studies. In addition, this research will depend statistically on using the multiple regression model to explain the relationships among the variables.

8. Literature Review

8.1: Taufiq Akba (2017)

The purposes of this study is to define the factors which cause fraud in the financial statements on industrial companies in Indonesia. An empirical study conducted to examine the study's hypotheses. The populations of the study include 144 industrial companies recorded in Indonesia stock exchange and its financial statements are available over the period 2013 to 2015. The sample of the study include 79 companies.

The results indicated that pressure factor is the only factor that affects the occurrence of fraud in the financial statements on manufacturing company in Indonesia during the observation period. While other elements like opportunity, rationalization and capability not influence on fraudulent financial statements. The results also showed that financial targets, financial stability, and institutional ownership used to measure pressure.

8.2: Zaki. N. M (2017)

This study empirically investigated the variation of the suitability in Fraud Triangle Model and the Fraud Diamond model in determining the probability fraud in the Financial Statement. The study uses Logistic Regression Model for testing the estimated relationships among variables to expecting the probability of fraud in the financial statements of firms.

The population of the study included companies recorded in the Egyptian stock exchange in 2012. The sample of the research consists of 100 industrial and trading companies recorded in the Egyptian stock exchange in 2012.

Results indicated that the probability of fraud in the financial statement is measured by three models; Altman Z Score, P Score and Beneish M- Score. Because of the shortage of the existence appropriate database to assort companies committing fraud from other companies in Egypt. The results also indicated that fraud diamond model is most suitable in expecting the probability of occurrence fraud.

8.3: Georgios Vousinas (2019)

This study investigated the need to update the most commonly used and widely accepted models to explain the main factors which play an essential part in whether fraud will really happen and emerging a model that will be depend on.

The results indicated that the fraud risk is a developing case influence both public entities and private organizations, fraud is hard to uncover and difficult to prove in a court of law because it adapts to the current environment. The results also suggested that trying to develop the Fraud Pentagon model (S.C.O.R.E.) model, that consist of five components (Stimulus, Capability, Opportunity, Rationalization and Ego), by adding the sixth component of collusion, the Fraud Hexagon model the (S.C.C.O.R.E) model is result, To reach a deep comprehension of the reasons behind fraud's existence to better apply in cases of financial crimes.

9. Study Outline

Based on the objective, importance, limitation, and what the researcher seeks to achieve, the study will be structured as follows:

1. Theoretical Background of fraud models

2. The essence of the auditor's responsibility for fraud prevention.

3. Using the fraud Hexagon model to predict fraud in the financial statements

4. Hypotheses Testing

5. Discussion of Findings

6. Concluding Remarks

7. Future Research

1. Theoretical Background of fraud models.

There are several theories about what motivates the fraudsters to commit fraud. Fraud researchers have also attempted to identify factors that lead individuals or corporations to commit fraud. A few significant ones are listed below:

1.1. The Fraud Triangle Model

The fraud triangle was established by Donald Cressey (1953), was the first American criminologist and sociologist researcher to determine the causes for the crime commit who conducted extensive research on the mindset of white-collar criminals. He identified three elements which must be present for occupational fraud (a pressure or incentive, an opportunity, a rationalization) that are necessary for fraud to occur. Cressey's research led him to develop the fraud triangle theory.

1.1.1. Pressure: A financial need that cannot be shared ,the key factor in committing fraud is pressures or incentives He listed three forms of pressure, including personal stress, occupational stress, and external pressure.

1.1.2. Opportunity: opportunities are a deficiency in the system where the individual has the incentive, strength and capability to manipulate and probability commit fraud. The weaker the corporate structure of internal control, inadequate auditing system, shortage of financial reports and bad separation of duties the more possible the opportunity to conceal fraud.

1.1.3. Rationalization: IT refers to the perpetrator's assumption that the dishonest and unethical behavior rather than criminal activity is something else. If he cannot rationalize his unethical behavior, it is unlikely that the person will commit fraud.

1.2. Fraud Diamond Model

It is expansion to fraud triangle model, it consist of four elements (Pressure, Opportunity, Rationalization and Capability). Capability is the skills and special character of the perpetrator of the fraud, which exploit opportunities to commit fraud.
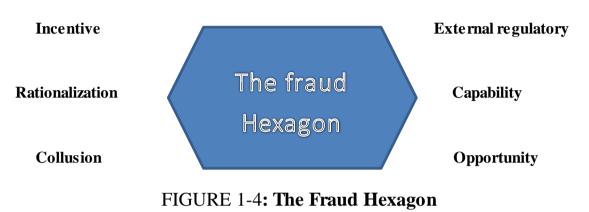
1.3. Fraud pentagon model

Fraud pentagon model is a new view of the phenomenon which adds the fifth factor External Regulatory as one of the current contributor in all circumstances wherever fraudulent financial statements happened.

External regulatory effect at its weakest will have a multiplier influence on the opportunity of fraud to occur. External regulatory indicates the existence of mechanisms to ensure that laws and regulations are not violated and sanctions and penalties are activated upon departure.

1.4. The Fraud Hexagon

In order to adjust to the recent progresses and the ever increasing fraud cases. Georgios create a new model which called the Fraud Hexagon model, to improve the comprehensive the key elements that lead to the occurrence of fraud.

The idea that the Fraud Hexagon model will be seen as an extension of the Fraud Pentagon model in order of apply better in white collar cases, must be emphasized. So the Fraud Pentagon model becomes the Fraud

Hexagon model, with the adding of the sixth component is collusion which plays a key role in assessing the conditions that contribute to financial fraud commitments, According to the above factors, the researcher will implement the hexagon model as shown:

Incentive		External regulatory
Rationalization	The fraud Hexagon	Capability
Collusion		Opportunity

FIGURE 1-4**: The Fraud Hexagon**

Source: The researcher based on previous studies

Collusion:

Fraud can be hard to discover, as it regularly includes cover-up through distortion of documents or collusion between management, employees or third parties. According to Georgios the word collusion mentions to a dishonest agreement or compact among two or more Individuals, Collusion may also be accidental when the fraud progresses inside an organization, the usage of fraudster's opportunity to benefit of others' situations to exploit unsuspecting persons.

Collusion is consider a key element in fraud accordance, It is also justified in the current ACFE Report (2016), Which indicated that almost 50% of the revised circumstances contain many perpetrators planning with one another to commit fraud, the more of fraudsters contain, the higher damages occurred.

2. The essence of the auditor's responsibility for fraud prevention.

The external auditors provide an impartial (independent) opinion on the fair presentation of the management's financial statements. The financial statement users rely on auditors and expect them to detect FSF.

the auditor must follow some requests that involve; exercise specialized suspicion, creating conferences with the audit group, comprehensive the company nature, acting techniques, plan and achieve extra audit processes in reaction to the risks, assessing the audit evidence gotten, and examining the management who responsible for authority to accomplish his obligation.

3. Using the fraud Hexagon model to predict fraud in the financial statements.

The dependent variable: Estimation the possibility of fraud in the financial statements (F) is measured by using Altman Z score. For that reason of the nonexistence of appropriate information to categorize fraud companies in Egypt.

Z scores act financial suffering in companies if it`s number is exceed 2.99, that means that there is no fraud in its financial statement, while if it`s number is less than 1.81, that means there is fraud in its financial statement.

The independent variable: fraud Hexagon model consist of six factors (Pressure, opportunity, Rationalization, Capability, External Regulatory, collusion).

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Table 1: Description of independent Variables

Variables	Description	Measurement
proxy of Pressure		
ROA	Financial pressures Measured by return on assets .	$$ROA = \frac{EBIT}{ASSETS\ (t)}$$
Indicator of Opportunity		
INDE	measured through a reduction the percentage of the number of independent members on the Board	INDE = Ratio of Independent member of board.
Indicator of Rationalization		
TATA	Total Accruals to Total Assets index	$$TATA = \frac{\Delta current\ asset(t) - \Delta cash\ (t) - \Delta current\ liabilities(t) - \Delta\ current\ maturities\ of\ LTD - (t)\Delta income\ tax\ payble\ (t) -\Delta Depreciation\ and\ amortization(t)}{Total\ assets}$$
Indicator of Capability		
(Change)	measured by Change in the Board of Director	A dummy variable coded by '1' indicate changes in the Board of Directors and coded by '0' Otherwise.
Indicator of External Regulatory		
(GOV)	It was measured by the effectiveness of corporate governance mechanisms	The size of Board of director, It is measured as dummy variable taking the value (1) in the event of The size of Board of director is more than six members, and takes the value (0) Other.
Indicator of Collusion		
(Coll)	Collusion.	A dummy variable coded by '1' indicate that the company have financial lawsuit and financial distress and coded by '0' otherwise.

4. Hypotheses Testing

This research aims to use the Fraud Hexagon Model to improve the comprehensive the main elements that cause the occurrence of fraud. Hypothesis test was conducted with logistic regression analysis. Logistic regression will experiment how dependent variable can be expected by the independent variables. As follows:

$$F_t = \beta_0 + \beta_1 ROA_t + \beta_2 INDE_t + \beta_3 TATA_t + B_4 Change + \beta_5 GOV + \beta_6 coll + \varepsilon_t$$

Descriptions:

F = Expectation of the Possibility of fraud in financial statements.

β_0 = Intercept, β_0 = Constants

β_1, 2,3,4,5, β_6 = Coefficient of the independent variables,

ε = Error term,

t = Year.

ROA = Return on assets,

INDE= Ratio of Independent member of Board,

TATA= The ratio of total accrual per total assets

Change= Changes in the Board of Directors.

GOV= Effectiveness of corporate governance mechanisms

Coll= Collusion

5. Discussion of Findings

The results display the growth in the descriptive power of the independent variables of fraud hexagon model. Therefore, it is perfect that the rely on the elements of fraud hexagon model; enhance the skills of auditors to expect the possibility fraud, and the important influence of collusion element (coll).

Therefor the study hypothesis is accepted incompletely. The incomplete approval of the study hypothesis is associated with the environment practice in Egypt, where authorized systems is weak and no appropriate permissions practical on the violators.

Lastly it is clarified that the hexagon model is the most suitable in expecting the possibility of fraud related to other fraud models. There are significant differences in the influence of all elements of fraud hexagon model, while the experimental outcome of this study displays deficiency of the important influence of certain variables of fraud hexagon model. This disputed results, stems from some weaknesses, as the lack of specialized regulating forms to supervise the quality of the audit process.

6. Concluding Remarks

1. Fraud is one of important incentives for the failure of the Companies and the distortion of the financial Scandals Previous studies have confirmed a strong inverse relationship between the fraud in the financial statements and the quality of the audit, where the higher the quality of the audit, the less fraud.

2. The importance of the development process of auditing, planning and performing adequate audit procedures to detect and report fraud.

3. It is extremely hard to detect fraud which constantly adapts to the current environment. This leads to the necessity of an operational mechanism to confirm the security and honesty of preparation of financial statements, therefore growing reliability of the financial statements information while performing the audit process.

4. The scope of analytical procedures includes several models which have been developed in order to clarify the causes why fraud occurs and also to contribute to the development of key factors that play an important role in preventing fraud.

5. The fraud hexagon model stems from the Fraud Pentagon which is an expansion to the Fraud Diamond, which is an extension to the Fraud Triangle.

6. The fraud hexagon model helps to enhance the proficiency of auditors in estimating fraud. Thus, it will lead to increase the quality of audit process.

7. Future Research

1. A new fields for future research include finding additional variables having influence on fraudulent financial statement.

2. Studying research area is to usage additional samples from other sector which is rarely used in a study concerning fraud, as mining, real estate.

3. Future research is expected to develop the hexagon Fraud Theory with other fraudulent proxies such as F-Score.

4. Future researches join between the secondary data and the primary data gotten through questionnaires to improve the study.

5. Essentially future researchers expand the range of sample i.e. 5 years.

6. Also, future researches should usage information from other sources such as the ministry of finance to strengthen the description of variables.

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