

**THE INVESTIGATION OF THE RELATIONSHIP BETWEEN FRAUD RISK
MANAGEMENT PRACTICES AND FIRM VALUE ON KENYA LISTED COMPANIES**

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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DEDICATION

This thesis is dedicated to Mondri's Family for their constant inspiration to work hard and smart and with dedication at all times.

ABSTRACT

All organizations can be victims of fraud incidents in one way or another. Listed companies play a key role in the economic development of a country. The study investigated the relationship between the Fraud risk management practices and firm value of the listed companies in the Nairobi Security exchange, Kenya. Fraud risk management practices are part of the governance function of an organization that looks at the management of fraud risks in a company with the intention of mitigating, detecting and responding to the risks before occurring, when they occur and after occurring. The study collected data by use of a 5-point Linkert –scale questionnaire. The data on firm value (Tobin`s Q) from the audited financial statements of the companies as provided on the 2017-2018 investor handbook by NSE was collected. Confirmatory factor analysis was conducted to test for construct validity of the data. The correlation findings revealed a positive and significant relationship between fraud risk management practices (corporate governance fraud risk practice, Preventive FRMP and Responsive FRMP) and firm value (Tobin`s Q). Other correlation findings indicated that detective FRMP and firm value show a positive but not significant relationship. The regression findings established that corporate governance fraud risk management practices have a positive and significant effect on firm value. But preventive, detective and responsive fraud risk management practices have a positive and not significant effect on firm value. While the relationship between firm size and firm value is negative and significant. The leverage and firm age have a positive and not significant effect on firm value. The study recommends an enhanced adoption of a devoted board and top management review of fraud incidents, whistleblowers, having an effective fraud department, implementing anti-fraud policy and a comprehensive ethics program. Other recommendations include; enhanced training on fraud risks, enhanced performance appraisal of fraud prevention, enhanced whistleblowing hotline system, progressive sanctions, disclosing the results of internal investigation to the regulator, prosecution of the fraud offender and recovery of the stolen funds.

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LIST OF ABBREVIATIONS AND ACRONYMS

ACFE	Association of Certified Fraud Examiners
CGMA	Chartered Global Management Accountant
CMA	Capital Market Authority
COSO	Committee of Sponsoring Organizations of the Treadway Commission
ERM	Enterprise Risk Management
EWRM	Enterprise-Wide Risk Management
FTT	Fraud Triangle Theory
PWC	Price Water House Coopers
USA	United States of America

DEFINITION OF KEY TERMS

The following definitions of terms were used in the study;

Fraud Risk Management

Fraud risk management can be defined as procedures developed and implemented to reduce risks that have potential results of corporate fraud. The activities that organizations develop with the intention of understanding the risks and coming up with ways to reduce them (Hussaini, Bakar, & Yusuf, 2019). This study adopted the definition by (Hussaini, Bakar, & Yusuf, 2019)

Preventive fraud risk management

Preventive fraud risk management can be defined as techniques employed by organizations to stop fraud from occurring in the first place (Othaman, Aris, Mardziah, Zainan, & Amin, 2015). This study adopted the definition by

Detective fraud risk management

Detective fraud risk management can be defined as a process that involves identifying fraud incidents as quickly as possible once it has been perpetrated and it is a continuous process because fraud evolves (Othaman, Aris, Mardziah, Zainan, & Amin, 2015). The study adopted the definition by (Othaman, Aris, Mardziah, Zainan, & Amin, 2015)

Fraud response and monitoring

Fraud response and monitoring can be defined as a process that involve formulation and implementation of effective and continuous communication procedures between the investigation team and the various stakeholders (ACFE, 2010). The study adopted this definition by ACFE, 2010.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Any organization can be a victim of fraud incidents (CIMA, 2008). Companies are said to create value when the return on investment is greater than the cost of the investment according to Tobin's theory (Tahir & Razali, 2011). Any activity or occurrence within the company that can undermine the return on investment will particularly affect the performance of the firm. Fraud incidences destroy companies' reputation, loss of investments, and loss of employment to many (ACFE, 2010). The listed companies require appropriate measures to ensure there is an effective mechanism to curb fraud in their organizations. Fraud has been of great concern both globally and locally. These trends have led to a number of laws being established in order to be able to curb the fraud cases (CBK, 2011). The fraud incidents undermine the growth of companies through loss of reputation, loss of money and loss of jobs to many people (PWC, 2018; ACFE, 2018).

In a survey conducted it shows that economic crime continues to increase (PWC, 2018; ACFE, 2018) and new risks are emerging and evolving (Golshan & Rashid, 2012). The advancement of technology has a big bearing on the increase in crime, and corruption is ranked highest in crime. The industries that are more affected by corruption are Energy (53%), Manufacturing (51%) and Government (50%) (ACFE, 2018). Africa has the highest economic crime at 62% in 2018, while Kenya's fraud risk is higher at 52%, which is above the African average of 50% and higher than the global average of 37% (PWC, 2018). Fraud risk is of much concern in many countries. Fraud cases have affected companies both financially and even complete collapse of the organizations. Fraud risk management practices have been established in many jurisdictions as part of the mechanism to curb risk incidences (Tahir & Razali, 2011), but from a survey by PWC (2018) only 54% in the last two years have undertaken a general fraud risk survey while other types of fraud little or no risk assessment has been conducted in cybercrime, bribery and corruption and money laundering. While these types of economic crime are high in the globe scale; cybercrime (31%), consumer fraud (29%), business misconduct (28%) and asset misappropriation (45%) (PWC, 2018).

Although fraud risk management practices are fundamental in management of risks, very few companies have adopted the practices. A longitudinal study conducted in the USA from 1997 to 2001 indicated that 41% of the firms had adopted ERM while on another study in the same country for the period 1999 to 2005 it shows that 42% of firms had adopted ERM (Golshan & Rashid, 2012). Another study by the Economic Intelligence unit in Europe, North America and Asia indicates that 41% of the firms had adopted some form of ERM (Watt, 2008). The reasons for low adoption of ERM include; limited information on value of ERM, low facilities to capture risk, complexities of business, fast changes in technology, globalization, quick change of product life cycles, lack of support from board of directors and low compliance with regulations (Watt, 2008; Beasley, Hancock, & Branson, 2009).

In the Kenyan context, a survey by PWC (2020) indicated that 36% of Kenyans faced a fraud loss of Kshs. 10million while only 2% faced a fraud loss of greater than Kshs. 500 million. Although firms in Kenya are aware of the fraud risks facing them and have established ways to overcome fraud incidences, the problem still continues to occur (PWC, 2020). The firms listed in the NSE have experienced a number of fraud incidents. For example, the former management of CBK who were in office as of 31st December 2015, had embezzled the bank's finances and practiced financial statement fraud, hence the CMA took action on them (CMA, 2018). Uchumi supermarket and Mumias Sugar which also are listed in NSE, senior management were found to be involved in asset misappropriation and smoothening of accounting figures of the firms for the 2014 and 2015 respectively (Cytonn Investment, 2018). The directors of CMC Motors were also involved in a scandal of boosting firm profit by accounting for vehicles that had not been delivered as revenues and did not capture interest payments for the vehicles sold on credit (Herbling, 2014). The East Africa Breweries and Kenya Airways Ltd were involved in fraudulent reporting disclosures for the period between 2011 and 2015 (Otieno, 2016). The level of fraudulent activities in the Kenyan listed firms may be attributed to weak corporate governance and internal controls in place (Ongoro, 2018). As it can be observed from the studies reviewed, still a problem exists on the Kenyan listed companies on ways to curb fraud incidence and hence improve firm value. The study sought to investigate the most effective mechanisms that can be used by firms listed in the NSE, to curb fraud incidence and the relationship with firm value.

According to ACFE (2010), the corporate governance framework is an important component of fraud risk management programs. It consists of; directorship, internal auditing, external auditing (Anderson, 1993) and the audit committee (IIA, 2003). A study by Dibra (2016) argues that if corporate governance fraud risk management practices are implemented properly they can mitigate fraud risks and hence improve firm value.

Preventive fraud risk management practices entail mechanisms employed by firms to avoid occurrence of fraud or to reduce the frequency of occurrence of fraud. The techniques employed include; fraud risk assessment program, internal controls, board audit committee, management oversight, anti-fraud policy and surprise audits (Ohando, 2015). Other techniques suggested by Gitau (2018), include; comprehensive ethics program, screening of staff members, screening of service providers, electronic alerts to members, reviewing controls and training on fraud. The findings suggest a strong negative correlation between preventive practices and net incurred claims (Gitau, 2018). Although a study by Waigumo (2012), found that preventive measures used in Kenyan banks are not significantly effective in curbing bank fraud.

Detective fraud risk management practices entail techniques put in place to detect an ongoing fraud or a fraud incident that has already happened (Othaman et al., 2015). Some of the key detection measures include; whistle-blower policy, software aided detectives, forensic investigation (Gitau, 2018), review of access control, physical securities and test of controls (KPMG, 2013), account reconciliation, electronic surveillance, increased attention of senior management, cash reviews (Halbouni et al., 2016). The detective measures can be good and properly implemented, but it can be difficult to detect fraud because senior management are involved in manipulating the results. According to KPMG (2017b), fraud is difficult to detect because of insider involvement hence making it take a long time to be identified, which further results in negatively affecting the performance of the firms. Gitau (2018), found that fraud detective measures have a moderate negative correlation to net incurred claims. That implies that as fraud detective practices are improved in the company the fraudulent practices will be detected and hence lead to improvement of the company performances. In another study it was found that fraud detective practices lead to improvement of performance to a great extent (Njenga & Osiemo, 2013). Furlan et al., (2011), found a positive significant relationship between detective fraud risk management and profitability. While another study found that detection fraud risks

management has no significant effect on the financial performance of companies (Ejjoh & Ejom, 2014).

Responsive fraud risk management practices entail taking corrective action to remedy the damage caused by fraud. The responsive techniques that have been suggested to be effective include; internal investigation, voluntary resignation, civil action for recovery, warning, immediate dismissal and disciplinary action (Kapardis and Papastergiou, 2016). A study by IIA, (2007), revealed that firms find it difficult to implement action and recommendations when directors are involved in the fraud.

The relationship between fraud risk management practices and firm value is affected by other control variables such as firm size, firm age and leverage. Firm size has been cited by past literature as a control variable in the study of risk management and performance (Allayannis & Weston 2001, Anderson, Duru & Reeb 2009). Prior studies argue that as a firm becomes larger or it goes public, agency conflicts are likely to arise (Jensen & Meckling 1976; Jansen 1986). The conflict between managers and shareholders can erode shareholders wealth and is likely to affect the firm value. Studies conducted have found a negative correlation between firm size and firm value (Tobin's Q) (Allayannis and Weston, 2001; Carter et al. 2006; and Tahir and Razali, 2011). But larger firms can increase their performance through large production by utilising the strength of manpower and money and minimizing risks. Other studies have found a positive link between firm size and firm value (Beasley et al. 2008; Hoyt & Liebenberg, 2008; Lin, Wen, & Yu, 2012). Studies have revealed that larger organizations encounter high levels of fraud activities due to the opportunity to commit fraud, motivation to commit and rationalization may be higher in large organizations as may be compared with the small organizations (Jackson,2011; Rick, 2013). In another study, it is argued that smaller organizations may experience more fraud than larger organizations because the organizations neglect to establish fraud risk management practices (Tysiac, 2015). In a study by ACFE (2012), it concurs that smaller organizations are much affected by fraud as compared by larger organizations because of the control measures put in place by large organizations, hence affecting the firm value.

Firm age refers to the span the company has been able to run its activities since it was founded (Ashari and Putra, 2016). Investors will consider firm age because it shows the ability of the company to exist and be able to compete in the world of business (Suryamis and Oetomo, 2014).

The firm age enables a company to gain experience in the industry and establish mechanisms for internal controls. This therefore gives the firms that have been in existence for a long period of time to have an operational advantage over the new firms (Beck et al 2005). Although different studies have come up with contradicting findings, some found a positive relationship between firm age and firm value (Ofoeda et al. 2016) while others found a negative significant effect on firm value (Putri and Arinies,2017).

Leverage is the proportion of debt to equity in the capital structure of a firm. Leverage also has been found to affect firm performance. But results have been contradicting with some finding a positive relationship between leverage and firm performance (Gleason et al, 2000), while others indicate negative relationship between firm performance and leverage level (Zeitun and Tian, 2007).

In measuring performance several parameters have been applied in different sectors and research that include; Return on assets, return on equity, Net interest margin, value added, capital base employee's performances and customer loyalty (Murthy & Sree, 2003; Alexandru, Genu, & Romanescu, 2008; Gitau & Samson, 2016). Various performance measurements have resulted to different results. The use of return on assets as a performance measure have shown a positive relationship between risk management and performance (Mburu, 2016; Yegon, 2015; Ohando, 2015) while usage of other measures such as Tobin's Q ratio have given a negative relationship between management of risk and performance (Abdullah et al., 2017; Lin et al., 2012). From these studies, it was observed that different performance proxies also result in different results of the relationship.

The different findings on the relation between fraud risk management practices and performance are due to various reasons that may be due to differences in; theories, proxies, methodology, and sectors. For instance, some studies have made use of various proxies to measure performance that have given diverse results such as return on asset giving a positive relationship between risk management and performance (Yegon, 2015; Ohando, 2015) while use of Tobin's Q ratio giving a negative relationship between risk management and performance (Abdullah, et al 2017; Lin, et al., 2012). Theories that are used by different studies give the variables that the study will use in conducting their work hence giving results that can vary according to the relationship and effect that independent proxies may have on dependent variables. Various sectors have different risks

and are guided by different theories and the independent variables can have different outcomes depending on the sector. For instance, some relationship on risk management for banks and insurance sectors may not necessarily have a direct effect on performance, this is because the sectors are highly regulated hence making other factors contribute towards the performance of the companies that are in other sectors of the economy that are not similarly regulated. Other factors that may contribute to the difference are economic situations, technological situations, political, and time when the studies were conducted. This study intends to contribute to the body of knowledge by establishing the relationship between fraud risk management practices and firm value for listed companies in the NSE in Kenya. The study made use of the COSO framework of fraud risk management practices that consists of corporate governance, preventive, detective and responsive and monitoring practices.

The Nairobi Security Exchange (NSE) was established in 1954 as a trading platform for listed companies to spur economic growth in Kenya (NSE, 2020). It is regulated by the Capital Market Authority (CMA) (Otieno, 2020). The NSE assists listed companies to access capital and encourages saving and investment (NSE, 2020). The exchange has listed 64 companies in 13 different sectors. Although the listed companies are regulated and have well developed mechanisms to curb fraud risks, the fraud incidences continues to be witnessed. Various listed companies have been involved in fraud case which have seen them recorded poor performance of the firms. Some of the listed companies that have witnessed fraud incidence include; Mumias sugar, Uchumi Supermarket, Kenya RE, East Africa Portland Cement, Kenya Airways, National Bank and Eveready ltd (Mpiana, 2017; Ongoro, 2018; Otieno, 2015; (Odhiambo, 2014); (Onyango, 2019)). The employees of Uchumi supermarket conspired with fraudulent suppliers to steal huge sums of money from the company that lead to the collapse of the supermarket (Business Daily, 2019). Also at East Africa Portland Cement Company, employees manipulated sales records to fraudulently ship huge consignment of cement from the Athi River warehouse (Odhiambo, 2014). The cases mentioned on listed companies just indicate a weak internal mechanism within the companies in the NSE to curb fraud incidences and hence boost company profitability. The study sought to investigate the relationship between fraud risk management practices and firm value of the Kenyan listed companies.

1.2 Statement of the Problem

Fraud has become common in the world as companies are going under due to mismanagement. Since the Enron scandal, WorldCom scandal, and Satyam case, the countries have stepped in, to establish laws and institutions to cap this mismanagement of the companies (Hussaini et al, 2019). Fraud risks need to be managed effectively and efficiently keeping in mind the impact it has on performance of a firm. However, statistics in Kenya show a different trend, that companies have been affected by fraud incidence such as Mumias sugar, Uchumi supermarket, National Bank, Kenya airways and Imperial Bank (Mpiana, 2017). The Kenya airways lost 17.95 billion shillings to fraud making the company share price to fall at the NSE (Mungai, 2016). The former director of Kenya Re embezzled 7.6 million Kenya shillings according to the court findings and was fined (Onyango, 2019). The East Africa Portland Cement employees were also involved in manipulation of sales records that led to fraudulent shipment of cement from the Athi River Warehouse causing the firm to lose millions of shillings (Odhiambo, 2014). The fraud incidences facing the companies as observed by the reviewed literature, indicate lack of proper corporate governance fraud risk management practices to minimize the occurrence. Hence these studies intend to bridge the knowledge gap on the necessary corporate governance fraud risk management practices that need to be employed by listed companies in order to eliminate fraud or minimize it and the effect they have on firm value.

Chartered Global Management Accountant (2012), suggests that an effective fraud risk management practice comprises of; corporate governance, preventive, detective and response and Monitoring. The listed companies in the NSE, lack sufficient policy of the management of fraud incidences. From the studies reviewed, (ACFE, 2018; Othaman et al., 2015; Waigumo, 2012; Sanusi et al., 2015; Davis & Pesch, 2013; Mirinariciene, 2014), there is limited research conducted in preventive fraud risk management practices and firm value on the Kenya listed companies. The study therefore intends to address the research gap, by investigating the effective preventive fraud risk management practices that can be employed by listed companies and the relationship they have in firm value.

Detective fraud risk management practices and firm value as can be observed from the reviewed studies; (Othaman et al., 2015; ACFE, 2018; Ohando, 2015; Njenga & Osiemo, 2013; Zhou &

Kapoor, 2011; KPMG, 2017b; Gitau, 2018), indicate that limited research has been conducted and the techniques involved may have not been efficient because insiders are involved in the fraud incidence occurring. The study therefore intends to investigate the detective fraud risk management practices that are effective and on the relationship, they have on firm value. The responsive fraud risk management practices that have been evoked by some Kenyan listed firms such as dismissal of directors like in CMC case (Otieno, 2016), prosecution and fines such as for Kenya Re (Onyango, 2019), as mechanism employed to prevent future occurrence of fraud incidence and help improve performance. But limited attention has been given to responsive fraud risk management techniques maybe because companies fear for their reputation. The study therefore aimed at investigating the effective responsive techniques that can be employed by listed companies in the NSE to curb fraud and the relationship they have to firm value.

Although these necessary techniques are employed to eliminate or reduce fraud occurrence other control variables come into play on the relationship between fraud risk management practices and firm value. The control variables that have been cited by literature that affect the relationship include; firm size, firm age and leverage. (Ofoeda, 2017). The study intends to establish the relationship between fraud risk management practices on firm value (Tobin's Q ratio) of listed companies in the NSE, Kenya.

1.3 Research Objectives

To investigate the relationship between fraud risk management practices on firm value of Kenya listed companies.

1.3.1 The specific objectives

The specific objectives guiding the study were,

- i. To investigate the extent fraud risk management practices are employed by Kenya listed companies.
- ii. To establish a relationship between corporate governance fraud risk management practices and firm value of Kenya listed companies.

- iii. To establish the relationship between preventive fraud risk management practices and firm value of Kenya listed companies
- iv. To establish the relationship between detective fraud risk management practices and firm value of Kenya listed companies
- v. To establish the relationship between responsive fraud risk management practices and firm value of Kenya listed companies

1.3.2 Research Question

- i. To what extent are fraud risk management practices employed by Kenya listed companies?
- ii. Is there a relationship between corporate governance fraud risk management practices and the firm value of Kenya listed companies?
- iii. Is there a relationship between preventive fraud risk management practices and firm value of Kenya listed companies?
- iv. Is there a relationship between detective fraud risk management practices and firm value of Kenya listed companies?
- v. Is there a relationship between responsive fraud risk management practices and firm value of Kenya listed companies?

1.4 Significance of the study

1.4.1 Board of Directors

The findings of the study will assist companies in coming up with proper policies that will guide companies in allocation of resources towards strengthening fraud risk management framework. The directors play a key role in the management by making investment decisions for the firms. The weak fraud risk management practices may expose the firm to risks that may be fatal to the company and information from the study will inform directors on the importance and relationship that exist between fraud risk management practices and performances of the firms. The study will inform directors on making key decisions on investment on the fraud risk management decisions

and the benefits that may accrue from proper implementation of the practices. It is assumed that the outputs of this study when used jointly with other evidence on the subject matter will lead to some level of uptake by decision makers in Kenya and the East Africa region

1.4.2 Researcher, Professional and Chief Risk Managers

The study will add to a body of knowledge by identifying how listed companies in NSE manage risks. The fraud risk management practices framework used by the listed companies will be identified and any weaknesses and challenges the framework has will be of concern for further research to improve. Although the framework has been established, the performance of companies is unchanged. The study will tend to look for the underlying issues that might cause this trend in performance. The issue under investigation is of key importance to industry captains and opinion leaders on behavior of business under the current setting.

1.4.3 Investors

The study will give additional knowledge to investors that are important in making investment decisions. The investors are key players in the security exchange and hence having a more understanding of firms that have proper mechanisms to curb fraud incidences is of importance to them. The study will provide additional insights on the fraud risk management practices undertaken by the various companies and the influence they have on the performance of the firms. Investors are keen on the performance and safety of the company they invest in; this is because of the resource they commit to these companies. Therefore, the study will be of importance in advising the investors about safe companies that they can invest in. This is because of the measures that have been established in detecting and preventing fraud risk incidences in the companies.

1.5 Scope of the study

The study focused on 62 listed companies in the Nairobi Security Exchange that had provided their audited financial accounts to the NSE as of 31st December 2017. The unit of analysis was the listed companies that had five- year continuous data over the period of 1st January 2013 to 31st December 2017. The listed firms are required by law to provide audited financial statements

annually to NSE. Therefore, these made their financial statements more reliable and reflect the fair view of financial position as may be compared with the ones not listed. A census of all listed firms in NSE that had submitted their audited financial statements were selected and three officers (managers) were selected purposely from finance, audit and risk departments. The departments were selected because they are usually involved in risk management and hence can provide reliable information on the topic. The target population involved all listed firms that provided their audited financial statement between 1st January 2013 to 31st December 2017 but the study excluded those listed within the period, because they do not provide statements for the entire period of five years. An average of the data was used in the study. The study collected both primary and secondary data. The primary data was collected on fraud risk management practices on the listed companies in the NSE. The secondary data was collected from the Nairobi Security Exchange (NSE) website on the performance of the listed companies. Hence the data was used in comparing the variables of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter covers the following sections; introduction, theoretical review, empirical review, conceptual framework and operationalization of variables.

2.2 Theoretical framework

This section covers theories that are relevant for explaining the relationship between fraud risk management practices and performances for listed firms in the NSE in Kenya. The theories that guided the study include; the fraud triangle theory, the fraud management lifecycle theory and cost and revenue efficiency theory.

2.2.1 The Fraud Triangle Theory

The theory originated from the works of Edwin Sutherland of 1939 who had come up with the term white-collar crime. The theory was developed by Cressey in 1950 who was a former student of Edwin Sutherland. It attempts to explain the causes of fraud. In his research, he had focused on the factors that make individuals to get involved in fraudulent and unethical activities. From this study, he came up with the Fraud Triangle Theory (FTT) that consists of the following three elements; the perceived pressure, opportunity, and rationalization.

The theory was developed as an aftermath of the creation of the fraud examination discipline. The study looks at the genealogy of the fraud triangle and follows on the translations underlying its creation. In the study it is argued that individuals are vectors of moral riskiness that need to be monitored and controlled by the organizations. It can be concluded that organizations need to be a place for addressing fraud through establishing systems that are vigilant to reduce these risks (Morales, Parracini, & Gendron, 2014)

The theory has provided the anti-fraud professionals with the framework for why fraud occurs and on the areas that they need to focus their attentions on situations when assessing fraud cases. The theory has been of help also in academics for teaching and learning for students in auditing and fraud courses. The theory further serves as the underlying model for standards used by

external auditors. The Fraud Triangle is important as a model for assessing the risks for fraud (Dorminey, Fleming, Krancher, & Riley, 2012). The study says that identification of fraud risks is an important element in the assurance services and requires a model that reflects the current state of fraud events. The study proposes a meta-model that will enhance the understanding of researchers and educators on what motivates fraudsters and how to improve anti-fraud community's ability to prevent, deter, detect, and investigate the fraud cases. The key aspects of the meta-model will be instructional benefits in the classroom and an empirical approach from a research standpoint.

Fraud triangle has been identified as a useful framework that has been employed to compact fraud and it has been used in experiment on risk assessment (Lokanan, 2015; Lasalle, 2007). The Association of Certified Fraud Examiners (ACFE) argues that fraud triangle communicates a restrictive version of Fraud. In this study, fraud is considered as multifaceted phenomenon whose contextual factors cannot fit into one particular framework. The findings concluded that, fraud triangle is not to be considered as a sufficiently reliable model for anti-fraud professionals.

The Fraud Triangle Theory's components have been revised to incorporate pressure, opportunity and capability. This is because of continued formal testing of the model in order to provide the anti-fraud professionals to clarify and extend their thinking about the factors which contribute to fraudulent activities (Boyle, DeZoort, Hermanson, & Wolfe, 2018). The theory has been criticized by various scholars and resulted in the development of the fraud Diamond theory and the fraud Pentagon theory. Wolfe & Hermanson (2004) presented on the fraud diamond theory in a CPA journal in December 2004. The theory added one more element to the FTT, and they argued that although perceived pressure can coexist with an opportunity and rationalization, fraud may not occur unless another element is present (capability). The potential perpetrator must have the skills and ability to commit the fraud. Capability enables the individual intending to commit a fraud to recognize the open door (opportunity) and hence take an advantage of it.

The theory concludes that fraud is committed by individuals who are employees of the company that identify an opportunity and take advantage of it. This implies that fraud can be reduced to a great extent if the motivating factors, opportunities and individual rationalization are properly managed by implementation of proper policies and controls. The opportunity to commit fraud can be due to lack of proper internal control and poor organizational structures established by the

companies. Therefore, it can be seen that opportunity to commit fraud is a major element that encourages fraud in companies and companies can reduce fraud incidences by establishing an effective fraud risk management program. The companies are required to eliminate or minimize opportunities to commit fraud, and this can be made possible by applying fraud risk management practices. The theory was applied in analyzing factors that lead to committing fraud and on the ways of eliminating.

Theory is related to the study objectives that sought to investigate the relationship between fraud risk management practices (corporate governance, preventive, detective and responsive) and firm value. The study results can show either the corporate governance fraud risk management or preventive measures are effective if the relationship with firm value will be positive. This will imply that the practices employed are able to curb the incidences of pressure and rationalization that lead to committing fraud. If the results on detective practices have a positive relationship with firm value it implies that the practices are effective to deny the fraudster an opportunity to commit a fraud. Finally, if the responsive measures employed have a positive relationship with the firm value, it will imply that responsive practices are effective in deterring rationalization that is one of the motivating factors to commit fraud. The study was much interested in the aspects of pressure, opportunity and rationalization, hence the fraud triangle theory was more relevant for this study, as opposed to other developments on the theory such as fraud diamond and fraud pentagon that have come up with additional factors, capability and personal ethics respectively.

2.2.2 The Fraud Management Lifecycle Theory

The theory was developed by Wesley Wilhelm in 2004 and attempts to explain the various stages that are involved in fraud management. In his study, he developed a theoretical framework for fraud management lifecycle through examining the various stages and how they interact with each other.

Fraud management lifecycle refers to a network lifecycle in which each node in the network, each stage is interrelated, interdependent, and independent actions, functions and operations. The fraud management lifecycle consists of eight stages that include; deterrence, prevention, detection, mitigation, analysis, policy, investigation and prosecution. The first stage, deterrence, is about the means employed to stop or prevent fraud before it is attempted. The second stage, prevention,

aims at preventing fraud from occurring. Detection, is the third stage, is about identifying and locating fraud prior to, during and subsequent period, until termination of the fraud activities. Mitigation is about stopping the fraud from continuing to occur and is the fourth stage of the fraud management lifecycle theory. Analysis, which is the fifth stage, aims at determining the losses caused by the fraud. The sixth stage, policy is about activities that will help creating, evaluating, communicating and assisting implementation of policies aimed at reducing incidences of fraud. The seventh stage, investigation, is aimed at gathering evidence to be able to stop fraud activities and provide evidence for prosecution. The last stage is prosecution which suggests the failures and successes in the fraud management lifecycles. Failures means that the fraud was successful while successes means that the fraud was detected, and the perpetrator identified and charged. The interrelationships in the stages are building blocks for fraud management lifecycle theory. (Wesley, 2004).

The theory has been applied by a number of prior studies (Waigumo, 2012; Chepkoech & Rotich, 2017; Gitau, 2018; Odhiambo, 2016; Ohando, 2015). Studies have noted that the theory is important for it shows which processes companies need to develop in order to minimise the fraud risks in their organisations. (Githecha, 2013; Gitau, 2018; Karanja, 2018). The theory has limitations that have been identified that include; no explanation on the drivers of fraud within commercial banks, in managing of fraud it is assumed to be similar in cultural, legal, technological applications and finally no explanation in case these practices fail (Githecha, 2013). A balance is needed within the various stages of the theory for effectiveness of fraud management to be achieved (Gitau, 2018)

In this study the eight stages of fraud management lifecycle interrelationship were assessed and evaluated. The eight stages of the theory can either lead to success or failure of fraud management and proper balancing of these activities of fraud management lifecycle stages can result in improved fraud management. A focus on only one of the stages can result in insufficient detection of the problem or fraud. For instance, a focus on prosecution alone may not be sufficient in the detection and also can result in providing low attention to deterrence mechanisms by the firm. Hence, this calls for a balance on all the stages of the life cycle for proper fraud management. A balance does not imply equal resource allocation but signifies to right allocation of resources for effective fraud management. The theory had relevance on the study in regards with the phases of

fraud risk management lifecycle. On the objective of corporate governance and prevention, the study sought to investigate if the practices employed are effective to deter fraud hence improve performance of the listed companies in Kenya, representing fraud deterrence and prevention stages of fraud management lifecycle. On detective practices the study sought to establish if detective practices are effective to deter fraud incidence and hence improve on firm value, these representing the fraud detective stage of the fraud management lifecycle. On responsive practices, the research sought to investigate if the responsive practices that represent mitigation, analysis, policy, investigation and prosecution employed are effectively utilized to improve firm value of the listed companies.

2.2.3 Cost and Revenue Efficiency Theory

The theory is directly derived from microeconomic theory that was developed by Adam Smith in 1776. The cost and revenue efficiency theory attempts to explain how input usage and output production can be used optimally. The theory provides a meaningful and reliable measure of performance (Grace, Levery, Philips, & Shimpi, 2010)

The theory is important in assessing the performance of a firm. Efficiency theory can be said to be the firm's ability to use the resources optimally. Cost efficiency refers to use of minimum required costs to produce a given level of output. Revenue efficiency refers to the ratio of the revenues of a given firm to the revenues of a fully efficient firm with the same input vector and output prices (Grace et al., 2010). Financial performance can be measured in terms of efficiency in management of current and rate of acquisition of new assets (Damodaran, 2008). Financial efficiency and operation efficiency have been used to measure a firm's value. Ratios such as liquidity ratio, solvency ratio, profitability ratio, current ratio and asset ratio have been used to measure financial performance of a firm (Pandey, 2009), while efficiency has been used to mobilize resources for production to measure financial performance of a firm (Grace et al., 2010). Financial performance can be measured by other methods such as: agency costs, Tobin's Q, discounted cash flows financial analysis and corporate social responsibility.

Tobin's Q method has also been used to measure financial performance of a firm (Tahir & Razali, 2011). The method was named after the founder, James Tobin in 1969. The measure uses a percentage of the firm's market value of asset to replacement cost of the firm's assets. The method

combines accounting and market information to measure performance and cannot be manipulated by management. The approximate "Q" is according to Tahir & Razali, (2011) and Hoyt & Liebenberg, (2008) who suggested to be equal to firm's share price multiplier by the number of common stock shares outstanding added to firm's preference stocks added to total net debt and divided by the book value of the total assets of the firm. The use of Tobin's Q as a standard proxy to measure firm value has been recommended (Tahir & Razali, 2011). The method has been applied in economic decisions such as cross-sectional studies of differentiation between investment and diversification; relationship between investment opportunities and tender offer responses and relationship for managerial performances and earnings. A firm is said to create value if the return on investment is greater than the cost of investment. A firm is said to be adding value if the marginal Q is greater than one, and if less than one the firm is said to fail. The firm is said to be at equilibrium if it is unity. Tobin's Q has been used as a proxy of firm value to measure the effects of ERM on firm value in cases where other variables exist such as size, leverage, profitability, international diversification and majority shareholders (Hoyt & Liebenberg, 2008; Tahir & Razali, 2011). Other studies that have made use of this theory are (Yegon, 2015; Grace et al., 2010; Tahir & Razali, 2011).

In conclusion, a number of proxies have been applied in measuring performance of firms. The study used Tobin's Q to measure the relationship between fraud risk management practices and firm value of companies listed in Nairobi Security Exchange (NSE), Kenya. The data was collected from the audited financial statements that had been submitted to NSE by the listed firms. The extracted data include; share price, number of common stock shares outstanding, and liquidating value of the firm's outstanding preferred stock, long term debt, short term liabilities, short term assets and total book value of the total assets of the firm.

2.3 Empirical Literature Review

The section covered the empirical literature review that is relevant for explaining the relationship between fraud risk management practices and firm value for listed companies in the NSE in Kenya. The fraud risk management practices used in the study include; corporate governance fraud risk management practice, preventive fraud risk management practice, detective fraud risk management practices, response and monitoring fraud risk management practices and a control variable that is firm size. An effective fraud risk management encompasses corporate governance,

prevention, detection, response and monitoring (Chartered Global Management Accountant, 2012). The study therefore made use of the framework by the Chartered Global Management Accountant, (2012) that recommends the four fraud risk management practices as effective in the management of fraud incidence.

2.3.1 Corporate governance fraud risk management and firm value

A number of authors have conducted research on corporate governance and performance of firms, who have come up with inconsistencies findings. According to ACFE (2010), the corporate governance framework is important in the fraud risk management program. Corporate governance has been described to consist of various components that are; directorship, internal auditing, external auditing (Anderson 1993) and the audit committee (IIA, 2003). When properly implemented it can mitigate fraud risks hence enhancing performance of the firm. But these can be achieved if only checks and balances are in place on the corporate governance and if not, corporate governance cannot prevent fraud risks in a firm (Dibra, 2016). Gitau, (2018) also suggests that corporate governance has a moderate correlation to net incurred claims ratios which is fraud risk ratio for insurances. The relationship shows that corporate governance is important in the fraud risk management for firms that needs to be considered by firms, for it will reduce fraud risks which further improves performance of firms. In another study by ACFE, (2010) it shows that lack of effective corporate governance seriously undermines any fraud risk management program and hence affects the performance of the firm. In a study by Akindele (2012) that examined the effect of risk management and corporate governance on bank performances, the result revealed that there exists a positive relationship between risk management and bank performance and that good corporate governance leads to better risk management. The study hence explored the role that is played by corporate governance fraud risk management on the firm value.

2.3.2 Preventive fraud risk management practices and firm value

Preventive fraud risk management entails mechanisms employed by organizations to avoid occurrence of fraud or to reduce the frequency of occurrence of fraud. The preventive component is on conducting fraud risk assessment for the company that aims at identifying the type, likelihood and potential costs of fraud risks that the company is exposed to (Robinson, 2012).

This is important for the firm to establish programs that are cost effective for mitigating risk and setting risk tolerance levels in the company. Preventive and deterrence measures are less costly as may be compared to fraud detection and litigation that require time and expense (Sanusi, Rameli, & Isa, 2015).

Previous studies on preventive fraud risk management have come up with diverse findings. Davis & Pesch, (2013) argues that uniform techniques cannot be applied across companies, but company characteristics should be the basis for establishment of fraud preventive measures. In a study Powell (2011), it argues that organizational culture is important on fraud awareness, policies and procedure and appropriate communication that may be employed by the organization towards prevention of fraud. The communication of this information on the importance of fraud prevention should be done from top to down. It can be seen from other studies that implementation of fraud prevention mechanisms is an efficient measure of preventing or deterring fraud (Mirinariciene, 2014). The study on fraud prevention had not received adequate research focus, maybe because fraud is a concealed crime that makes it difficult to have in place proactive fraud prevention controls. It is important for research to focus also on the individual and organizational environment in order to establish proper controls for the organization (Davis & Pesch, 2013; Coenen, 2008). Commercial banks use preventive fraud risk management practices in order to put fraud risk exposure under control hence resulting in improving performance of the banks. They use a number of techniques that include; fraud risk assessment program, internal controls, board audit committee, and management oversight, anti-fraud policy and surprise audits (Ohando, 2015). While other studies show that preventive fraud risk management is ineffective leading to an increasing cases and costs of fraud (Odhiambo, 2016; Auma, 2014). In a study by Gitau (2018), it revealed that fraud preventive practices have a strong negative correlation with net incurred claims. The practices include; comprehensive ethics programs, screening of staff members, screening of service providers, electronic alerts to members, reviewing controls and training on fraud. This implies that as companies establish effective preventive fraud risk management practices it will lead to improvement on the detection of fraudulent claims and hence increase performance of the firm.

Therefore, based on these diverse findings and limited studies on use of preventive fraud risk management practice there is a need for more research in this area.

2.3.3 Detective fraud risk management practices and firm value

Detective fraud risk management involves identifying fraud incidences as quickly as possible once it has been perpetrated. Although preventive control measures are employed by organizations it will not be absolute, hence the importance of the detective measures that can efficiently identify fraud once it occurs and take necessary action (Australian Standard, 2008). Some of the key detection measures include; whistle-blower policy, software aided detectives, forensic investigations (Gitau, 2018), review of access control, physical securities and test of controls (KPMG, 2013). Other measures that have been identified as effective detectives are; account reconciliations, electronic surveillance, increased attention of senior management, cash reviews (Halbouni, Obeid, & Garbou, 2016).

Other studies have alternative views on fraud detection controls. Some suggest that fraud detection measures may not lead to more fraud detection but can result in a development of instruments such as fraud control policies and fraud risk registers. (Kummer, Kishore, & Peter, 2012). While Zhou & Kapoor, (2011), concludes that although good detection measures are put in place fraud is difficult to detect because executives are involved in manipulating the results. According to KPMG (2017b), fraud is difficult to detect because insiders are involved hence taking long to be identified, this further results in negatively affecting the performance of the firms. There is also a lack of commitment of most organizations in countering fraud while others organizations and individuals are reluctant to report frauds (Button, Gee, & Brooks, 2011). In the study by Gitau (2018), the results reveal that fraud detective practices have a moderate negative correlation to net incurred claims. This implies that as fraud detective practices are improved in the company, the fraudulent practices will be detected and hence lead to improvement of the company performances. In a study by Njenga and Osiemo (2013), it revealed that fraud detection leads to improvement of financial performance to a great extent. In another study by Furlan, Vasilecas, and Bajec (2011), who conducted research on motor insurance fraud management systems in the USA, found a significant positive relationship between detective fraud risk management and profitability. While another study on the financial performance of tertiary institutions in Nigeria found that detection fraud risk management has no significant effect on the financial performance (Ejoh & Ejom, 2014)

From the studies reviewed there exists inconsistency in the findings of the detective measure as some support the role of detecting fraud incidence and improve performance while others argue that the detective measures are not able to accomplish this. Therefore, this study intends to explore the relationship between detective fraud risk management practice and firm value.

2.3.4 Responsive and monitoring fraud risk management practices and firm value

Responsive fraud risk management involves taking corrective action to remedy the harm caused by the fraud. The actions should be appropriate and timely for ensuring potential fraud are handled in an effective manner. It involves formulating and implementing protocols between the investigation teams and stakeholders that need to be communicated efficiently and consistently (ACFE, 2010). The action should be objective and measurable in order to mitigate fraud hence enhancing performance of the firm (Bartsiotas & Gopinathan, 2016). The response and monitoring can only be achieved in an organization if proper policies and procedures are in place. But if this policies and procedures are not available then responding to fraud will suggest like witch-hunting in the organization. Other researchers have found that lessons from previous incidents are important for continued improvement of monitoring structure to be in place (Idowu, Ighosewe, & Nkechi, 2016). According to ACFE (2010), organizations need to have several ways of reporting fraud incidences for effective control. The tone at the top has key role in ensuring that this ways of reporting are in place and working (Biegelman & Bartow, 2012).

Some of the effective measures for responsiveness and monitoring include; internal investigation, voluntary resignation, civil action for recovery, warning, immediate dismissal and disciplinary action (Kapardis & Papastergiou, 2016). In a study by IIA (2007), it found that organizations have a challenge of implementing action and recommendations where executives are suspected to perpetrate fraud.

2.3.5 Control variables; Firm size, firm age, leverage and firm value

Firm size has been cited by past literature as a control variable in the study of risk management and performance (Allayannis & Weston 2001, Anderson, Duru & Reeb 2009). Prior studies argue that as a firm becomes larger or it goes public, agency conflicts are likely to arise (Jensen & Meckling 1976; Jansen 1986). The conflict between managers and shareholders can erode shareholders wealth and is likely to affect the firm value. Studies conducted have found a negative

correlation between firm size and firm value (Tobin's Q) (Allayannis and Weston, 2001; Carter et al. 2006; and Tahir and Razali, 2011). But larger firms have resources and expertise to increase firm value through mass production or by managing strategic risks effectively. Other studies have found a positive link between firm size and firm value (Beasley et al. 2008; Hoyt & Liebenberg, 2008; Lin, Wen, & Yu, 2012). Studies show that larger organizations may experience a high level of fraud activities because the opportunity to commit fraud, motivation to commit and rationalization may be higher in large organizations as may be compared with the small organizations (Jackson, 2011; Rick, 2013). In another study, it is argued that smaller organizations may experience more fraud than larger organizations because the organizations neglect to establish fraud risk management practices (Tysiac, 2015). In a study by ACFE (2012), it concurs that smaller organizations are much affected by fraud as compared by larger organizations because of the control measures put in place by large organizations hence affecting the firm value.

2.4 Measurement of Fraud Risk Management

Various methodologies can be employed to measure fraud risks of a firm. The measurements are important in identifying the risks a firm is facing and hence enable the firm to establish proper mitigating techniques and resources allocated to the fraud risk management lifecycle. The commonly used techniques include;

Fraud risk score cards- is a methodological approach of fraud risk self-assessment that is based by five main steps, that are quantification, assessment of the effectiveness of the current controls, assessment of the fraud risk after taking into account of the present controls, net risk or residual risk, and the response plan that was developed by European Commission (2015) same has been developed by COSO, ACFE, CIMA. Quantification of the risk type is by assessing the impact and likelihood (gross risk). The assessment of the effectiveness of the controls in place to mitigate the gross risk of the firm. Then followed by assessment of the fraud risk after taking into account the effect of any present controls and how effective they have been conducted. After evaluations of the controls and their effectiveness, the resulting risk is referred to as net risk or residual risk. Hence the net risk is used to carry out a risk profiling that defines the target risk. Once the controls have been seen to be effective and a risk level is established by managing authority as a tolerable risk by the firm. Hence, the response plan has a basis of risk scores, which reflects the extent of the resources that may be employed by the firm. The higher the score of the

rank, the more attention and resources that should be allocated by the firm to manage the high risk fraud score areas of the firm. The response plan needs to be effective although the plans have some defects. Hence, the higher effective the plan, the lower the residual risk of the firm and if the effectiveness of the plan is low then the residual risk will be higher.

Fraud risk heat maps-is a tool used to present a risk assessment process visually. Ma kay (2011) defines a risk heat map as a tool used that shows the result of a risk assessment process in a visual perspective in a meaningful and concise way. The heat maps are about evaluating the likelihood and potential impact of the risks that may be identified in a firm. The risk heat maps represent both the qualitative and quantitative evaluations of the probability of risk occurrence and the impact of the risk to the organization (Shubbak & Thorne, 2015; Gitau, 2018). In order for the risk heat maps to be effective a common understanding will be key in three main areas; the risk appetite of the company, the level of impact that is material to an organization and the way of assigning probabilities and potential impacts. Organizations can map probability ranges to common qualitative characteristics of the risk likelihood and a ranking scheme for potential risks. Also organizations can use range on what is material in financial terms or using the strategic achievement of the organizations. The commonly used fraud residual risk as a basis to consider the extent at which risk is reduced, the various mechanisms used by the company such as internal control and fraud risk management practices. The fraud heat maps are usually useful to executives and boards in understanding potentially devastating risks that merit the board attention. The heat map gives a plot of the likelihood of the various types of fraud against the significance in the firm. A number of scholars have used the fraud risk heat maps on their studies (Toby & Frank, 2009; CGMA, 2012)

Fraud risk scoring-is a process of showing the level of risk when applying some fraud risk factors that are in place. They should be designed to be simple to calculate, interpret and to action. The scoring method contains three basic components; a set of consistent rules for assigning numerical values to each risk factor that reflect the underlying risk, a formula for calculating the scores and a set of thresholds that help to translate the calculated score back to the probabilities. The risk score are designed to represent the underlying probability of an adverse event. In order to relate the risk factor and the probability, an estimate of weights is carried out. Research has been

conducted using this method by a number of scholars (Raub, Hamazah, Jaafar, & Baharim, 2016; Singh & Singh, 2015)

The limitations of the methodology include that for complex methods it will be hard to assign weights to each risk factor and hence give a simple formula to calculate the score.

Likert scale fraud risk survey- is a 5- or 7- point scale that gives a range of options to the respondent from one extreme point to the other extreme, such as extremely likely to not at all likely. The scale is named after its founder, American social scientist Rensis Likert. It is most popular because it is reliable in measurement of opinions, perceptions, and behaviors. It is commonly employed on research that involves questionnaires. The scale can be employed to measure the presence or absence of fraud risk management practices in an organization. The respondents are supposed to indicate the level of agreement or disagreement with the various statements that are listed in the questionnaire. The Likert scale assumes equidistant of the items of the scale. The Likert items are the statements that the respondents are asked to evaluate their opinion, or perception and behaviors in a quantitative value. A well designed Likert scale needs to exhibit both symmetry and balance. Symmetry means that there are equal numbers in the positive and negative positions from the zero value. Various researchers have used Likert scale on their study (Ohando, 2015; Gitau, 2018; Mburu, 2016) in order to establish the presence or absence, the intensity and effectiveness of the internal controls and fraud risk management practices employed by the various institutions. Although, it is beneficial and easy to use, some have criticized the scale, that the respondents may lead to an extreme end or do not give opinion at all. These may result in wrong findings that lean toward one extreme end or middle point. The study employed the 5-point Likert scale in determining the opinions and perceptions of respondents towards fraud risk management practices of the listed companies in the NSE.

2.5 Research summary

From the empirical literature review above, it can be observed that limited studies have been undertaken in line with fraud risk management practices and firm value (Coenen, 2008; Davis & Pesch, 2013). Contradicting findings have been reported in corporate governance fraud risk management practices, others have found a moderate correlation with net incurred claim ratios (Gitau, 2018), while other studies have found a positive correlation between corporate

governance and performance (Akindele, 2012). Studies have reported that preventive fraud risk techniques cannot be uniform across companies, but depend on the company characteristics (Davis & Pesch, 2013). The preventive fraud risk measures have not received adequate research focus, maybe because fraud is a concealed crime that makes it hard to have proactive measures in place (Davis & Pesch, 2013; Coenen, 2008). Previous studies have demonstrated that detection fraud risk measures may not lead to more fraud detection but may result in new establishment of tools, such as fraud control policies, and fraud risk registers. The studies continue to argue that executives are involved in the crime hence making it difficult to be detected and have no commitment to countering the fraud. Detective fraud risk practices have contradicting findings, where some found significant and positive relationship between detective fraud risk management practices and performance (Furlan, Vasilecas, & Bajec, 2011), while others found moderate negative correlation to net incurred claims (Gitau, 2018). The studies on responsive fraud risk management practice revealed that lessons from previous incidents are key for improvement of monitoring tools. Also as companies go public or become large, conflict arises and may affect the company performance. Previous studies have found contradictory results. Some have found negative correlation between firm size and firm value while others have found a positive link between firm size and firm value.

2.6 Research Gap Matrix

The review of literature has established that fraud is of great concern both globally and locally and has led to laws and regulation to be established to curb the fraud cases (CBK, 2011). All industries can be affected by fraud (ACFE, 2018). Many countries have established fraud risk management practices as one of the steps to curb fraud risk incidences (Tahir & Razali, 2011). Although establishment of the practices, fraud incidents continue to grow, maybe due to; limited information, complexities of the business, fast changes in technology, globalization, quick change in product life cycles, low support of board of directors and poor policy (Beasley et al. 2009; Watt, 2008).

The review of literature shows contradicting findings between fraud risk management practices and performance. Some study have found positive and significant relationship between risk management practices and performance (Akindele, 2012; Gordon et al, 2009; Yegon , 2015) while others have found a negative relationship between risk management and performance (Abdullah

et al, 2017; Lin et al, 2012) and others have found no relationship (Pagach & Warr, 2010). The results imply that researchers have not come to agreement on how to leverage risk in order to improve performance hence necessitating more research in the area.

The review also established that studies have been conducted on certain sectors. Studies on fraud risk management practices have been undertaken for; insurance companies (Gitau 2018; Furlan et al. 2011), Banking sector (Ohando, 2015; Akindele, 2012; Olamide et al. 2015; Karanja, 2018; Sanusi et al. 2015; Githecha, 2013), tertiary institution (Ejoh & Ejom, 2014), Deposit taking Microfinance (Njenga & Osiemo, 2013) and Non-Governmental organization (Kariuki, 2017). A study on listed companies by Yegon (2015), researched on the determinants of enterprise risk management on financial performance. The determinants studied include: firm's characteristics, information technology, staff capacity and regulatory framework. Therefore, this study intended to investigate the extent fraud risk management practices are established by listed companies in the NSE and the relationship between fraud risk management practices and firm value for listed companies in NSE, Kenya.

Table 2. 1 Summary of literature review and research gaps

Name of the Author	Purpose of the research	Findings	Research Gaps	Response to the Gaps
Waigumo, G.L. (2012)	To establish the effects of preventive and detective controls on fraud in Kenya commercial banks	The study established that both preventive and detective control had no significant impact on bank fraud	A knowledge gap existed in establishing more variables; corporate governance preventive, detective, responsive and	This study established that corporate governance, preventive and responsive have a positive and significant influence on firm value while

			control variable of firm size	detective has a positive influence but not significant Firm size has negative and significant influence on firm value
Yegon, C.K, (2015)	To find out the effect of enterprise risk management determinants on financial performance on the NSE listed firms in Kenya	The study established that effective management of ERM determinants has effect on financial performance of the listed firms in Kenya	A knowledge gap existed in establishing the relationship between fraud risk management practices and firm value of listed companies in Kenya. As the study had studied determinants; firm characteristics, staff capacity, information technology and regulatory framework	This study established that corporate governance, preventive, responsive fraud risk management practices have a positive and significant influence on firm value while detective has positive but not significant effect on firm value. Firm size has a negative and significant

				influence on firm value.
Gitau (2018)	To establish the effects of fraud risk management practices on fraud levels in Kenyan medical insurance sector	The study established that fraud risk management practices significantly predicted the level of net incurred claim ratio. The findings imply that strong fraud risk management practices are likely to reduce the level of fraudulent insurance claims	A knowledge gap existed on establishing how the fraud risk management practices relate with performance on the other sectors	The study established that fraud risk management practices affect performance (firm value), corporate governance, preventive and responsive fraud risk management practices have a positive and significant influence on firm value, while detective fraud risk management practices have positive and non-significant influence on firm value.

Ohando (2016)	To evaluate fraud management strategies adopted by insurance companies in Kenya	The study established that a positive relationship existed between fraud risk management practices and financial performance of commercial banks in Kenya. Preventive and detective fraud risk management practices had a very strong positive influence on financial performance(ROA) of commercial banks	A knowledge gap existed on establishing how fraud risk management practices relate with firm value in the other sectors. ROA was use as a proxy for financial performance, other proxy can be used for performance.	The study established that fraud risk management practices have influence on firm value (Tobin's Q), corporate governance, preventive, responsive fraud risk management practices have positive and significant influence on firm value, while detective fraud risk management practices have positive but not significant influence on firm value.
Odhiambo (2016)	To evaluate fraud	The study established that insurance companies use	A knowledge gap existed on	The study established that

	management strategies adopted by insurance companies in Kenya	normal internal controls systems to manage fraud. The study established that the strategies are ineffective leading to increasing cases and cost of fraud.	establishing the effective mechanisms that insurance can use to cap fraud hence improve performance of the firm.	corporate governance, preventive, detective and responsive fraud risk management practices can be used to improve performance. The practices were established to influence performance positively.
Tahir & Razali (2011)	To estimate the relationship between ERM and firm value in the Malaysian public listed companies	The study established that ERm is positively related to firm value but it is not significant	A knowledge gap existed in establishing the relationship between fraud risk management practices and firm value of listed companies in Kenyan economy	The study established that fraud risk management (corporate governance, preventive and responsive) has a positive and significant influence on firm value while detective has a positive but not

				significant influence on firm value
Njenga & Osiemo 2013	To investigate effect of fraud risk management on organization performance with focus on deposit-taking microfinance institutions in Kenya.	The study established that anti-fraud policies, corporate governance, fraud detection and internal controls improve organization performance.	A knowledge gap existed on establishing the relationship fraud risk management practices have on firm value for different sectors of the economy	The study established that fraud risk management practices have a positive and significant influence on firm value. The firm size has a negative and significant influence on firm value.

Source: Researcher (2020)

2.7 Conceptual Framework

Conceptual framework can be defined as an analytical tool used by a researcher to give an understanding of a situation that is at hand (Kombo & Tromp, 2009). Conceptual framework has been defined as a description of an issue that is followed by graphical representation of the variables of the study. The conceptual framework helps the researcher to describe how the variables of study interact.

A conceptual framework is composed of variables of a study. A variable can be defined as a measurable activity that can assume different values in the study population (Mugenda, 2008). A variable can also be defined as a concept that assumes different quantitative values which may include; weight, height or income (Kothari, 2009)

The conceptual framework of the study consists of the dependent variables and independent variables. The dependent variable of the study is firm value as measured by Tobin's Q value. The independent variable of the fraud risk management practices includes; corporate governance fraud risk management practices, preventive fraud risk management practices, detective fraud risk management practices, responsive and monitoring fraud risk management practices and a control variable that is firm size.

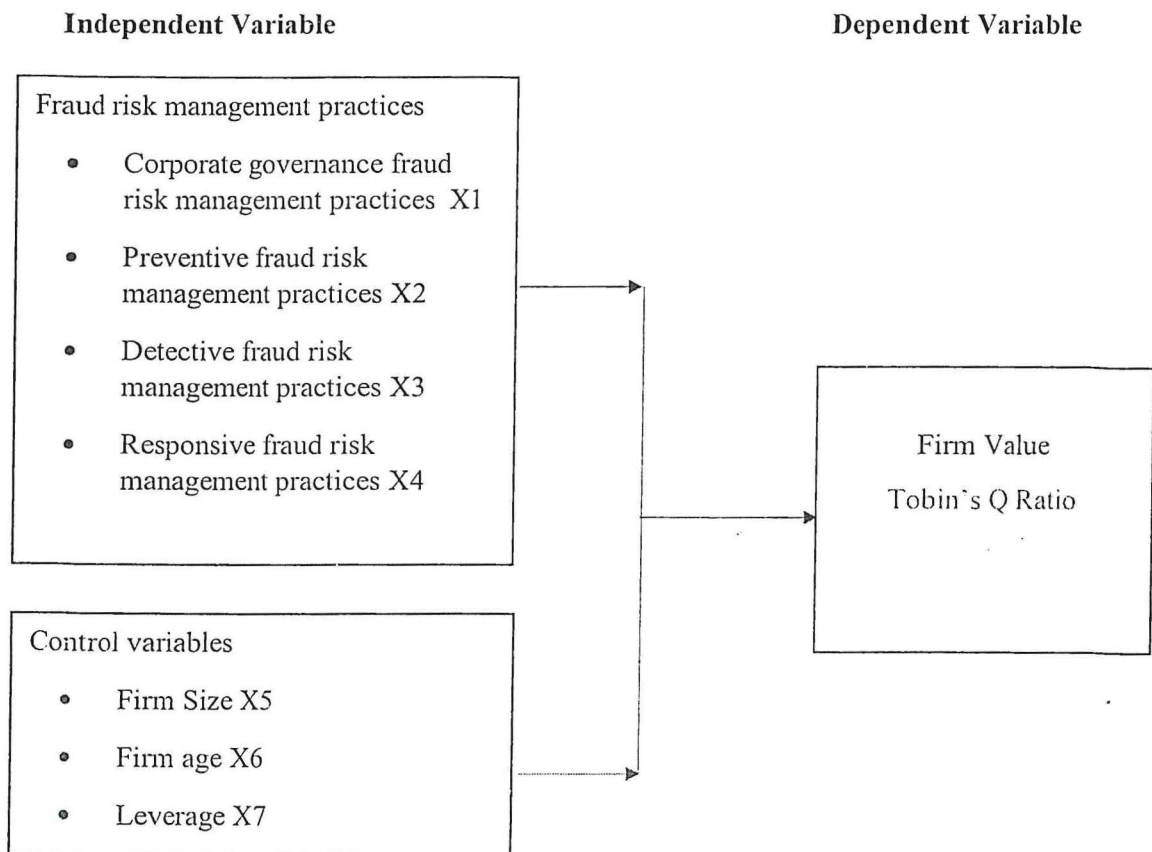


Figure 2.1 Conceptual Framework of FRM Practices and Firm Value

2.7.1 Operationalization of the variables

2.7.1.1 Firm value

Firm value which is the dependent variable for study was measured by Tobin's Q ratio. According to a study by Chung & Pruitt (1994), Tobin's Q ratio can be used as a proxy of firm value. Tobin's Q method has been used to measure financial performance (Hoyt & Liebenberg, 2008; Tahir & Razali, 2011) The data was collected from audited financial statements for the period 1st January 2013 to 31st December 2017. To calculate Tobin's Q ratio, the following items were collected from audited financial statement; firm's share price, number of common stock shares outstanding, firm's outstanding preferred stock, firm's long term debt, firm's short term liabilities, firm's short term assets and total book value of assets of the firm

$$Q = \frac{(MVE + PS + DEBT)}{TA}$$

TA

2.7.1.2 Fraud risk management practices

Fraud risk management practices are the independent variable of the study. In this study the fraud risk management practices were evaluated by extent they are implemented by the various listed companies in the NSE, Kenya. A 5-likert point scale was used to measure the extent the various practices are implemented. Where 5 imply very large extent, 4 – large extent, 3- Moderate extent, 2- Small extent and 1- Not at all. Different studies have described corporate governance fraud risk management practice to consist of the following components; directorship, internal auditing, external auditing (Anderson, 1993) and audit committee (IIA, 2003). Preventive fraud risk management practices consist of different components; fraud risk assessment, internal controls, board audit committee, management oversight, anti-fraud policy and surprise audits (Ohando, 2015). While detective fraud risk management practices consist of the following components; whistle-blower policy, software aided detectives, forensic investigations (Gitau, 2018), review of access control, physical securities and test of controls (KPMG, 2013), account reconciliations, electronic surveillance (Halbouni et al. 2016). Responsive fraud risk management practice

composes of the following; internal investigation, voluntary resignation, civil action for recovery, warning, immediate dismissal and disciplinary action (Kapardis & Papastergiou, 2016)

2.7.1.3 Firm size

Firm size has been considered by various studies as a control variable in the study on risk management and performance (Allayannis & Weston, 2001; Anderson, Duru & Reeb, 2009). Studies have found firm size to be a critical factor that affects the performance of the firm (Ofoeda, 2017). The previous findings on the effect of firm size on performance are not consistent. Studies conducted reported that bank size has a positive and significant effect on performance (Ng, Ye, Ong, & Teh, 2017; Paul, Devi, & Teh, 2012). While other studies have reported that bank size has a negative relationship to profitability (Sufian & Chong, 2008).

Table 2. 2 Operationalization of variables

Independent variables	Constructs	Operational constructs	Measurements	Supporting literature	Supporting Theory
Corporate governance fraud risk management practices	Having a fraud policy, Internal auditing, External auditing, Audit committee, Having a department on fraud risk management, Devoted Board and Top Management review of fraud incidences	Perceived effectiveness of Having a fraud policy, internal auditing, External Auditing, Audit committee, Having a department on fraud risk management, Devoted Board and Top Management review of fraud incidences	A 5- point Likert scale of extent of agreement	Anderson (1993), IIA (2003)	Fraud Management Lifecycle Theory and Fraud Triangle Theory
Preventive fraud risk management practices	Fraud risk assessment program, Board of directors oversight, Use of technology to prevent fraud, proper	Perceived effectiveness of Fraud risk assessment program, Board of directors oversight, Use of technology	A 5- point Likert scale of extent of agreement	Ohando (2015), Gitau (2018)	Fraud Management Lifecycle Theory and Fraud Triangle Theory

	<p>internal control, Use of code of conduct and standards, Proper training, proper recruitment of staff, Surprise audits, Use of whistle blower, Having fraud departments, Implementation of antifraud policy, Proper support program for employees, Comprehensive ethics program,</p>	<p>to prevent fraud, Proper internal control, Use of code of conduct and standards, Proper training Proper recruitment of staff Surprise audits Use of whistle blower Having fraud departments Implementation of antifraud policy Proper support program for employees Comprehensive ethics program</p>			
Detective fraud risk management practices	<p>Internal audit, External audits</p>	<p>Perceived effectiveness of Internal audit</p>	<p>A 5- point Likert scale of extent of agreement</p>	<p>KPMG (2013), Halbouni, obeid &</p>	<p>Fraud Management Lifecycle Theory and Fraud</p>

	Management reviews Account reconciliation Monitoring systems for detecting fraud Training on fraud risks Tip-off from internal Tip-off from external Performance appraisal of fraud prevention Analytical reviews of the accounts Whistleblowing hotline system Law enforcement investigation Job rotation Proper segregation of duties Detective software Forensic investigative review	External audits Management reviews Account reconciliation Monitoring systems for detecting fraud Training on fraud risks Tip-off from internal Tip-off from external Performance appraisal of fraud prevention Analytical reviews of the accounts Whistleblowing hotline system Law enforcement investigation Job rotation Proper segregation of duties Detective software		Garbou (2016)	Triangle Theory
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	<p>Increasing budget of investigative function</p> <p>Shared databases of fraud cases</p>	<p>Forensic investigative review</p> <p>Increasing budget of investigative function</p> <p>Shared databases of fraud cases</p>			
Responsive fraud risk management practices	<p>Conducting internal investigation</p> <p>Progressive sanctions</p> <p>Disclosing the results of internal investigation to the regulator</p> <p>Prosecution of the fraud offender</p> <p>Remedying the harm caused</p> <p>Strengthening controls</p> <p>Communicating to the employees that management took appropriate action</p> <p>Public disclosure of</p>	<p>Perceived effectiveness of</p> <p>Conducting internal investigation</p> <p>Progressive sanctions</p> <p>Disclosing the results of internal investigation to the regulator</p> <p>Prosecution of the fraud offender</p> <p>Remedying the harm caused</p> <p>Strengthening controls</p> <p>Communicating to the employees that management took</p>	A 5- point Likert scale of extent of agreement	Kapardis & Papastergiou (2016)	Fraud Management Lifecycle Theory and Fraud Triangle Theory

	<p>fraud and misconduct</p> <p>Recovery of the stolen funds</p> <p>Defined fraud investigation and reporting procedures</p> <p>Introduction of hotline</p> <p>Incentives for whistle-blowing</p>	<p>appropriate action</p> <p>Public disclosure of fraud and misconduct</p> <p>Recovery of the stolen funds</p> <p>Defined fraud investigation and reporting procedures</p> <p>Introduction of hotline</p> <p>Incentives for whistle-blowing</p>			
Firm size	Book value of total assets			Allayannis & Weston 2001, Anderson et al., 2009, Ofoeda, 2017	
Dependent variable- Firm Value	Firm's share price, common stock shares outstanding, liquidating value of the firm's		Tobin's Q Ratio	Chung & Pruitt 1994, Hoyt & Liebenberg 2008,	Cost and Revenue Efficiency Theory

	outstanding preferred stock, firm's long term debt and net of firm's short term liabilities and firm's short term assets, total book value of the total assets if the firm			Tahir & Razali, 2011	
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Internal audit

External audits

Management reviews

Account reconciliation

Monitoring systems for detecting fraud

Training on fraud risks

Tip-off from internal

Tip-off from external

Performance appraisal of fraud prevention

Analytical reviews of the accounts

Whistleblowing hotline system

Law enforcement investigation

Job rotation

Proper segregation of duties

Detective software

Forensic investigative review

Increasing budget of investigative function

Shared databases of fraud cases

SECTION E: RESPONSIVE FRAUD RISK MANAGEMENT PRACTICES

To what extent do you practice the following responsive fraud risk management practices in prevention, deterrence and detection of fraud incidences in the listed companies? Give your ratings in a Likert scale of 1 to 5 (Where 1 = Not at all, 2= Small extent, 3= Moderate extent 4 =Large extent 5= Very large extent)

Responsive Fraud Risk management practices	1	2	3	4	5
Conducting internal investigation					
Progressive sanctions					
Disclosing the results of internal investigation to the regulator					
Prosecution of the fraud offender					
Remedying the harm caused					
Strengthening controls					
Communicating to the employees that management took appropriate action					
Public disclosure of fraud and misconduct					
Recovery of the stolen funds					
Defined fraud investigation and reporting procedures					
Introduction of hotline					

Incentives for whistle-blowing

APPENDIX III: NAIROBI SECURITY EXCHANGE

Listed Companies in NSE as classified per sector

Agricultural sector

1. Eaagards Ltd
2. Kakuzi Ltd
3. Kapchorua Tea Co. Ltd
4. The Limuru Tea Co. Ltd
5. Sasini Ltd
6. Williamson Tea Kenya Ltd

Automobiles & Accessories

7. Car & General (K) Ltd Banking
8. Barclays Bank of Kenya Ltd
9. CFC Stanbic of Kenya Holdings Ltd
10. Diamond Trust Bank Kenya Ltd
11. Equity Group Holdings Ltd
12. Housing Finance Group Ltd
13. I & M Holdings Ltd
14. KCB Group Ltd Ord
15. National Bank of Kenya Ltd
16. NIC Group PLC
17. Standard Chartered Bank Kenya Ltd
18. The Co-operative Bank of Kenya Ltd

Commercial and Services

19. Atlas African Industries Ltd
20. Express Kenya Ltd
21. Kenya Airways Ltd
22. Longhorn Publishers Ltd
23. Nation Media Group Ltd
24. Standard Group Ltd
25. TPS Eastern Africa Ltd
26. Uchumi Supermarket Ltd
27. WPP Scangroup Ltd
28. Deacons East Africa
29. Eveready East Africa Ltd
30. Sameer Africa Ltd

Construction & Allied

31. ARM Cement Ltd
32. Bamburi Cement Ltd
33. Crown Paints Kenya Ltd
34. E.A. Cables Ltd
35. E.A. Portland Cement Co. Ltd

Energy & Petroleum

36. Kengen Co. Ltd
37. KenolKobil Ltd

38. Kenya Power & Lighting Co. Ltd

39. Total Kenya Ltd

40. Umeme Ltd

Insurance

41. Britam Holdings Ltd

42. CIC Insurance Group Ltd

43. Jubilee Holdings Ltd

44. Kenya Re Insurance Corporation Ltd

45. Liberty Kenya Holdings Ltd

46. Pan Africa Insurance Holdings Ltd (Sanlam Kenya plc)

Investment

47. Centum Investments Co. Ltd

48. Home Afrika Ltd

49. Kurwitu Ventures Ltd

50. Olympia Capital Holdings Ltd

51. Trans-century Ltd

Investment Services

52. Nairobi Security Exchange Ltd Ord4

Manufacturing & Allied

53. B.O.C Kenya Ltd

54. British American Tobacco Kenya Ltd

55. Carbacid Investment Ltd
56. East African Breweries Ltd
57. Flame Tree Group Holdings Ltd
58. Kenya Orchards Ltd
59. Mumias Sugar Co. Ltd
60. Unga Group Ltd

Telecommunications & Technology

61. Safaricom Ltd

Real Estate Investment Trust

62. Stanlib Fahari I-REIT. Ord. 20

(Adopted from NSE Handbook 2017-2019)

APPENDIX IV: BUDGET

Description	Amount
Printing papers for questionnaire printing and final thesis 7 rims @600	4,200.00
Printing and internet services	5,000.00
Binding for thesis	30,000.00
Transport during data collection	10,000.00
Nacosti Fee	1,000.00
Ethical Review Fee	10,000.00
Total Amount	60,200.00

APPENDIX V: STRATHMORE UNIVERSITY –IERC APPROVAL

Mr Moindi, Enock
enock.moindi@strathmore.edu

Dear Mr Moindi,

RE: Relationship Between Fraud Risk Management Practices and Firm Value of Listed Companies in The Nairobi Security Exchange, Kenya


This is to inform you that SU-IERC has reviewed and approved your above research proposal. Your application approval number is SU-IERC 0853/20. The approval period is 24th August 2020 to 23rd August 2021.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MIA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 72 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 72 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://nris.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely,


Dr Virginia Gichuru,
Secretary; SU-IERC

Cc: Prof Fred Were,
Chairperson; SU-IERC



Ole Sangale Rd, Madaraka Estate PO Box 59257-00200, Nairobi, Kenya, Tel +254 (0)20 336880
Email: info@strathmore.edu www.strathmore.edu

APPENDIX VI: INFORMED CONSENT

Title of Research: Relationship between fraud risk management practices and firm value of listed companies in the Nairobi Security Exchange, Kenya.

Principle investigator: Enock Nyagwencha Moindi, Master student, at Strathmore University,

Email: enock.moindi@strathmore.edu, Mobile: 0729534456

Institutional Contact:

I agree to participate in this research project conducted by the research has been explained to me and I understand that it seeks information about

.....

1. Introduction and purpose of the study

The study aims at investigating the relationship between fraud risk management practices and firm value for listed companies in the Nairobi Security Exchange, Kenya. Listed companies play a key role in the economic development of a country which can be reflected by the rise or fall of share prices. Fraud risk management practices are part of the governance function of an organization that looks on the management of fraud risks in a company with the intention of mitigating, detecting and responding to risks before occurring, and after occurring. The study will utilize questionnaire to collect data on fraud risk management practices used by various companies and then check if they have any relationship with firm value of the company. The data on company value (Tobin Q ratio) will be collect from Audited financial statement submitted to the NSE, as compiled in Investors handbook 2017/2018.

2. Description of the Research

The study will therefore involve collection of data from staff members of the listed companies in finance, internal audit and risk departments. The independent variables (fraud risk management practices) data will be collected using a questionnaire. While the dependent variable (firm value) will be collected from audited financial statement submitted to NSE, for the period 1st January 2013 to 31st December 2017.

3. Research Participation

The study participants will include staff members from the finance, internal audit and risk departments. The three departments are mainly involved in risk mitigation and controls of a company. The staff member need to be in a management position to be part of the participants group. Therefore, the study intends to involve finance manager, internal audit manager and risk manager of companies listed in the NSE that had submitted their audited financial statement to NSE for the five years with effect from 1st January 2013 to 31st December 2017.

4. Potential Risks and Discomforts

No known risks

5. Potential Benefits

The study may not have a direct benefit to you, but your participation may benefit the industry and society on the governance of the companies.

6. Confidentiality

The research being done on fraud risk management practices by listed companies may draw attention to other participants and rise some questions. The researcher will not share information about you or your organization to anyone outside the research team. The information that will be collected from this study will be kept private on lock and key. The information about you or your company will have a number instead of your name or name of your company. Only the researcher will know your number and will lock the information. The information is strictly for academic purpose and will be treated in the strictest confidence.

Authorization

When you sign this form, you authorize the use and disclosure of the information for this study.

7. Compensation

You will not be provided with any incentive to take part in the research.

8. Voluntary Participation and Authorization

You can opt not to participate in the study, for it is fully voluntary and for not participating will not affect our prior relationship.

9. Withdrawal from the study

You are free to withdrawal from participating on the study at any point, but kindly inform the researcher in writing and any information obtained prior to withdrawal will be included in the study.

10. Cost

No cost will be required to participate in the study, for the questionnaire will be dropped by the researcher and later picked.

I voluntarily agree to participate in this research program

Yes []

No []

I understand that I will be given a copy of this signed Consent Form

Name of Participant.....

Signature:.....Date:.....

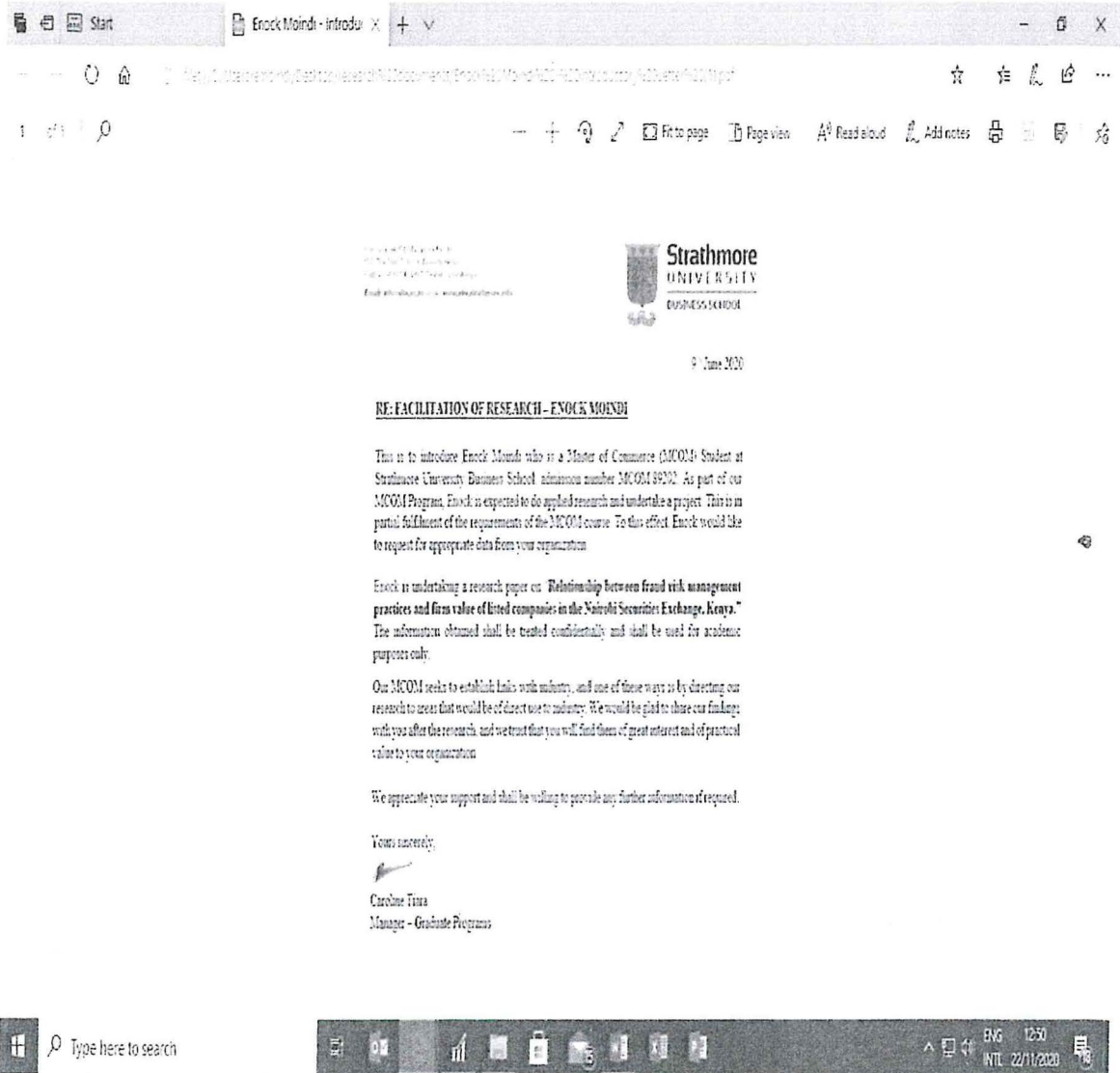
Name of Witness:.....

Signature:Date:.....

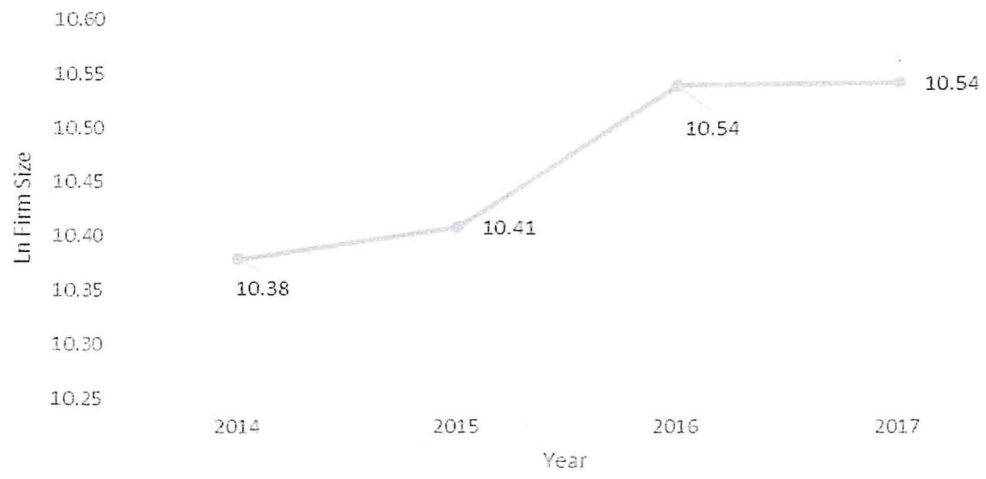
Person Obtaining Consent:

Signature: Date:

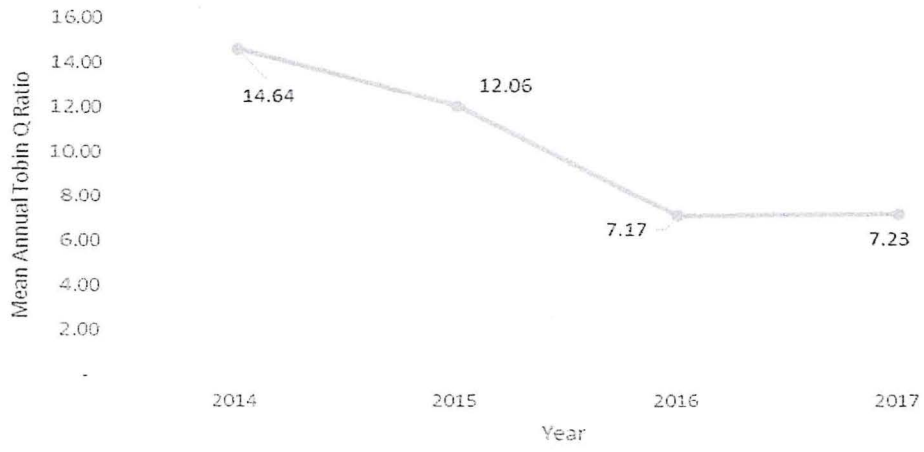
APPENDIX VII: STRATHMORE UNIVERSITY INTRODUCTORY LETTER



APPENDIX IX: TREND ANALYSIS OF FIRM SIZE



APPENDIX X: TREND ANALYSIS OF FIRM VALUE



APPENDIX XI: FACTOR EXTRACTION

Factor Analysis			
	Component		
	1	2	3
RFRM1	0.611	-0.039	-0.383
RFRM2	0.816	-0.07	-0.175
RFRM3	0.414	0.634	0.097
RFRM4	0.716	-0.36	-0.075
RFRM5	0.646	-0.054	0.586
RFRM6	0.588	-0.032	0.167
RFRM7	0.785	-0.172	0.089
RFRM8	0.268	0.758	-0.071
RFRM9	0.615	0.338	-0.235
RFRM10	0.664	0.113	0.324
RFRM11	0.411	-0.283	0.298
RFRM12	0.546	-0.193	-0.606
Extraction Method: Principal Component Analysis.			

a 3 components extracted.			
Component Matrix			
	Component		
	1	2	3
CG1	0.573	0.322	-0.544
CG2	0.296	0.833	0.071
CG3	0.295	0.551	0.572
CG4	0.603	-0.403	0.358
CG5	0.555	-0.608	0.27
CG6	0.757	0.139	0.036
CG7	0.554	-0.213	-0.489
Extraction Method: Principal Component Analysis.			
a 3 components extracted.			
Component Matrix			
	Component		
	1	2	3

PFRM1	0.152	-0.211	0.651
PFRM2	0.786	-0.055	-0.166
PFRM3	0.241	0.582	-0.437
PFRM4	0.727	-0.287	-0.047
PFRM5	0.452	-0.406	-0.502
PFRM6	0.740	-0.147	0.011
PFRM7	0.797	-0.188	-0.062
PFRM8	0.852	-0.138	-0.115
PFRM9	0.631	0.352	0.407
PFRM10	0.722	0.486	-0.005
PFRM11	0.837	0.208	-0.001
PFRM12	0.834	0.022	0.164
PFRM13	0.879	-0.111	0.079
PFRM14	0.830	0.044	0.095
Extraction Method: Principal Component Analysis.			
a 3 components extracted.			

Component Matrix			
	Component		
	1	2	3
DFRM1	0.652	0.215	-0.263
DFRM2	0.616	0.427	-0.17
DFRM3	0.638	0.548	-0.154
DFRM4	0.625	0.562	-0.223
DFRM5	0.715	-0.285	-0.051
DFRM6	0.739	-0.382	0.021
DFRM7	0.667	0.005	0.098
DFRM8	0.608	-0.565	-0.141
DFRM9	0.762	-0.391	-0.068
DFRM10	0.679	0.431	-0.24
DFRM11	0.705	-0.385	-0.052
DFRM12	0.732	-0.336	-0.096
DFRM13	0.661	-0.096	-0.198
DFRM14	0.706	0.223	-0.078

DFRM15	0.667	-0.098	0.118
DFRM16	0.465	0.221	0.69
DFRM17	0.507	0.267	0.579
DFRM18	0.622	-0.035	0.595
Extraction Method: Principal Component Analysis.			
3 components extracted.			
Component Matrix			
	Component		
	1	2	3
RFRM1	0.611	-0.039	-0.383
RFRM2	0.816	-0.07	-0.175
RFRM3	0.414	0.634	0.097
RFRM4	0.716	-0.36	-0.075
RFRM5	0.646	-0.054	0.586
RFRM6	0.588	-0.032	0.167
RFRM7	0.785	-0.172	0.089

RFRM8	0.268	0.758	-0.071
RFRM9	0.615	0.338	-0.235
RFRM10	0.664	0.113	0.324
RFRM11	0.411	-0.283	0.298
RFRM12	0.546	-0.193	-0.606
Extraction Method: Principal Component Analysis.			
3 components extracted.			