INTERNAL CONTROL SYSTEM AND FRAUD PREVENTION IN BANKING SECTOR IN KENYA

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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DEDICATION

This research is dedicated to the most important people in life; my beloved mother Maria Karimi M'tuarichu, my loving wife Mary Karwirwa and my precious daughter Marvel Maria Karimi.

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ACRONYMS AND ABBREVIATION

ACFE	Association of Certified Fraud Examiners
AfDB	African Development Bank
ANOVA	Analysis of Variance
AQI	Asset Quality Index
AVE	Average Variance Extracted
BFID	Bank Fraud Investigation Department
CBK	Central Bank of Kenya
CFI	Comparative Fix Index
COSO	Commission of Sponsoring Organization
DEPI	Depreciation Index
DSRI	Days Sales in Receivable Index
EIB	European Development Bank
GMI	Gross Margin Index
ICS	Internal Control System
IFAC	International Federation of Accountants
IIA	Institute of Internal Auditors
LVGI	Leverage Index
MMR	Moderated Multiple Regression
NBK	National Bank of Kenya
NSE	Nairobi Securities Exchange
OLS	Ordinary Least Square
PCA	Principal Component Analysis
PWC	Price Waterhouse Coopers
RM	Malaysia Ringgit
RMSEA	Root Mean Square for Error Approximation
Rs	Indian Rupees
SGAI	Sales, General and Administrative Index
SGI	Sales Growth Index
SRMR	Standardized Root Mean Residual

SW	Shapiro-Wilk
TATA	Total Accruals to Total Assets
USD	United State Dollars
VIF	Variance Inflation Factor
WTO	World Trade Organization

OPERATTIONAL DEFINITION OF TERMS

Fraud	Any act, omission, concealment of any fact or abuse of position committed by any person with intention to deceive, to gain undue advantage from, or to injure the interests of any person.
Control Environment	This is a set of standards, processes, and structures that provide the basis for carrying out internal control across the organization.
Risk Assessment	This is a process for identifying risks, estimating the significance of the risks, assessing the likelihood of their occurrence, and deciding upon actions to manage risks.
Control Activities	These are actions supported by policies and procedures that, when carried out properly and in a timely manner, manage or reduce risks.
Communication of information	These are mechanisms and means of capturing, processing and dissemination of relevant information at the right time and to the right person in order to deter fraudulent activities.
Monitoring	It is a process of evaluating and assessing controls put in place to ensure that they are consistently applied to reduce cases of fraudulent activities.
Earning management	This is the use of accounting principles and techniques to present a positive view of financial statements of an organization in order to mislead the stakeholders on the actual financial position of the organization.

ABSTRACT

The main objective of the study was to determine the effect of the internal control system on fraud prevention in the Banking Sector in Kenya. Studies have been carried out by different researchers some focused-on fraud in commercial banks and others on internal controls in government departments. This study filled the gap by focusing on the effect of internal control system on fraud prevention in banking sector. Research was based on control environment, risk assessment, communication of information, and monitoring as independent variables, compliance with prudential regulations as moderating variable and fraud prevention as dependent variable. Theories that guided the study include; agency, fraud management lifecycle, fraud triangle and fraud diamond theories. The study captured various empirical studies to provide more information on the study on this research area. Pragmatism philosophy, the research designs applied were descriptive and correlational. The study utilized mean and standard deviations for descriptive research design. The study involved all banks registered and operating in Kenya and the respondents were all branch managers, operations managers and cash managers or supervisors in all headquarters or offices of these banks. Questionnaire was used for primary data and secondary data schedule for secondary data correction. Coding of data was undertaken for processing and analysis. Document analysis was used to analyse qualitative data. ANOVA test was applied to test the overall significance of the model, to test multicollinearity to determine whether there is inter-correlation among independent variables, the variance inflation factor was used, to test autocorrelation and heteroscedasticity, Durbin-Watson test and Breusch-Pagan test respectively were applied. Exploratory factor analysis was applied to extract factors where principal component analysis and varimax rotation methods were applied where seven factors were extracted. Confirmatory factor analysis was used to determine construct bias and validity and was concluded that there was no bias and the research instruments were valid. Further analysis on determination of model fit involved chi-square, comparative fix index, root mean square for error approximation, pclose and standardized root mean residual and was found that the model fit well except for SRMR. Karl Pearson's coefficients of correlation were used to test the strength and to show the direction of association of variables and the t-statistics was applied to test the hypotheses. The hypotheses tests were based on structural equation modelling and it was found that risk assessment, communication and monitoring had significant effect on fraud prevention whereas control environment and control activities had insignificant effect. Further it was found that compliance with prudential regulations has no significant moderating effect on the relationship between control environment and fraud prevention and risk assessment and fraud prevention. The study applied Beneish model and probit regression in analysis of secondary data and it was found that financial statement manipulation is rife in seven banks thus those banks have weak ICS and are not capable of preventing fraud. Recommendations from study are that new ways of strengthening ICS should be established and that the government should review regulations. Further research should be carried out with cross sectional research design that will include questionnaire, interview and secondary data schedule.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Fraud in an act that involves lies, concealment and violation of trust in order to obtain assets, business or personal advantage, gaining property and services without paying (Institute of Internal Auditors (IIA), 2009). Fraudulent activities are common and extensive in organizations but more extensive in financial institutions such as banks due to the instruments of their trade. Banks are more susceptible to fraud as a result of operating in liquid cash and cash equivalent. Frauds generally affect banks by causing financial, operational or psychological loss (Adetiloye, Olokoyo & Taiwo, 2016). Bank frauds bring a lot of sufferings to all stakeholders and collapse of many banks is connected to massive frauds experienced (Odi, 2013).

The biggest challenge in banking sector in India is to free transactions in banks from crimes perpetrated through electronic means. Fraud through internet and other networks in the banking sector has become a cause of concern due to its magnitude. Operations in banking sector have presented opportunities to fraudsters to commit crime, particularly in deposit, loan and inter-branch transactions (Bhasin, 2015). The fraud perpetrated or assisted by the insiders consisted of 61% of the total funds lost. Banking fraud in India increased from Rs 2013 crore to Rs. 8646 crores between 2008 and 2013. By the end of month of March, 2013 Indian banking sector had lost an accumulated value of Rs. 31,401 crores through fraud, a large portion of these amounts being lost by commercial banks (Kaveri, 2014). Ernst and Young Report (E&Y) in 2012, indicated that Indian economy lost about Rs. 6,600 crores through fraud between the year 2011and 2012, in this report banks were the most affected (Bhasin, 2015).

In Canada occupational fraud has been rampart, of 90 cases investigated by Peltier-Rivest and Lanoue (2015), it was found that 25% of the cases generated a loss of one million Canadian dollars. Investment bank in Canada lost four billion and nine hundred million due to weakness in ICS. The cost of fraud has been found to be enormous as the stocks of

firms that have fraudulently manipulated their accounts have been found to fall by even five hundred times the amount of fraud. In Turkey ABC bank misappropriated customers deposit to a tune of US$27.8 billion in what was referred to as control fraud and it was taken over by government (Ilter, 2014). In Malaysia banking sector, the prevalent fraud cases are credit fraud which consist of 69% of total fraud, asset misappropriation consist of 8%, credit card fraud consist of 7%, money laundering and internet fraud consist of 6% and banking statement fraud consist of 4% of total fraud. Banks in Malaysia have lost a total forty seven million and nine hundred thousand Malaysia ringgit (RM) through money laundering that led with RM25 million, banks lost RM15.7 million through credit fraud and through asset misappropriation the banks lost RM7.2 million (Sanusia, Rameli & Isa, 2015).

China entered into accord with World Trade Organisation (WTO) in 2001, after this accord, there was deliberate efforts to strengthen corporate governance and risk management assisted in discovering fraud instances at Chinese banks (Higgins, 2012). Ministry of Commerce in China revealed that corrupt individuals had fled the country and had taken around 50 billion United States dollars (USD). Auditors of the Bank of China (BOC) discovered that up to half a billion USD was missing from accounts (Higgins, 2012). Karagiorgos, Drogalas and Dimou (2013) in their research study concluded that most bank failures are attributed to fraud. In the United States (US), bank failures doubled in 1980s partly due to fraud and poor management. In 2014, there were 14 cases of bank failures in the US which was encouragingly a reduction compared to the same period in 2013 where there were 16 cases of banks failure.

A research study by Okonkwo and Linda (2016) showed that, Banks in Nigeria lost approximately 25.61 billion naira to fraud and forgeries in 2014. This amount indicated an increase of about 3.81 billion naira or 17.5% compared to what was lost in the immediate previous year (21.80 billion naira in 2013). Fraud cases reported also increased to 10,612 in 2014 compared to 3,786 cases reported in 2013. Financial system in Nigeria suffers from fraudulent practices that are perpetrated by bank employees, people outside the banks as well as corporate bodies. The fraud in banks in Nigeria

surged between 1992 and 1995 which lead to collapse of several banks (Okonkwo & Linda, 2016).

Deloitte East Africa a consultancy firm, in a survey report showed that banks in East African lost approximately USD 48.3 M to fraud between January 2011 and June 2012 due to collaboration between insiders and fraudsters (Kabue & Aduda, 2017). The collapse of Chase bank in 2015 was orchestrated by the loss of Sh. 15 billion as the audit revealed. In 2015 the bank reported a loss of Sh.742 million as compared to a profit of Sh. 2.3 billion in 2014, this pointed out that the bank had manipulated financial statements (Amadala, 2019).

Banking Fraud Investigations Department (BFID), a fraud investigating department of the Central Bank of Kenya (CBK) reported that banking system within Kenya is highly susceptible to fraud according to the survey conducted by the department on fraud. In the banking fraud report by BFID, it was reported that banking fraud in Kenya had increased three folds to Sh1.7 billion in the third quarter of 2010 (BFID, 2011). Mukanda (2013) stated that Kenya's banking sector has become a very easy target for fraudsters who have been defrauding banks on monthly basis. In the month of December 2013 alone, nearly Sh500 million was reported stolen from 33 banks in the country. Enhancement of information communication technology has led to increased cases of fraud. Cyber criminals gain un-authorized access to the organizations' systems and data then perpetrate fraud (Central Bank of Kenya, 2017).

Price Waterhouse Coopers (PWC) (2018) in their report indicated financial institutions have become easy targets for customer frauds, these frauds were at 65% in 2018. Cases of fraud perpetrated by employees and other top management within organization declined from 70% to 62% between 2016 and 2018. However, frauds committed by external entities increased from 17% to 30% between 2016 and 2018. A report by PWC (2018) indicated that 21% of the respondents in Kenya had lost between Sh. 10 M and Sh. 100 M, 67% of respondents had lost at least Sh. 2.5 M and 2% had lost about Sh. 500 M through fraud and other economic crimes between 2016 and 2018.

1.1.1 Internal Control System

Internal control system (ICS) is said to work properly if the five components - control environment, risk assessment, control activities, communication of information and monitoring are present and functioning well (Commission of Sponsoring Organization (COSO), 2013). Control environment are factors which determine whether policies, procedures and methods are effective for a particular process (Okonkwo & Linda, 2016). The control environment as a component of ICS entail integrity and ethical values of the organization; these elements ensure that the top management undertakes governance oversight responsibilities, undertake duties of dividing responsibilities and giving authority, ensuring the organization is attractive to potential employees, ensuring that employees are developed and mandate to facilitate retention of competent individuals. The top management is also mandated to establish accurate performance measures, develop incentives and rewards mechanisms to improve accountability for performance. The resultant control environment has a wide spread impact on the whole system of internal control (Akwaa-Sekyi & Rene, 2016). PWC (2012) indicated that, the control environment entails all the functionalities of management and governance, the attitudes, alertness and actions of those entrusted with responsibilities of governing and managing internal controls and their importance in the organization.

Risk assessment entails identification and analysis of potential errors and also implementation of controls, policies and procedures that are capable of exposing those errors and try to prevent their commission (Okonkwo & Linda, 2016). Every entity is susceptible to a variety of risks which may come from either inside or outside the organization. The management should ensure that each risk is handled and assessed properly in order to achieve the organization's objectives. (Gamage, Lock & Fernando, 2014). Control Activities are precautionary actions and measures selected and developed for determining the acceptable and tolerable level of risks through policies checks and balances (Akwaa-Sekyi & Rene, 2016). The management should come up with proper control activities and manage employees' expectations while undertaking these activities. Control activities are common and are undertaken and various stages and all processes within the organization (Mathew, 2011). Control activities entails approving

and reconciliations of transactions, performance reviews, authorizations, verifications, securing organization's assets, separation of responsibilities, and information systems management (Etengu & Amony, 2016).

Communication of information is concerned with identification, capture and exchanging of operational, financial and compliance related information on timely bases. Information that is relevant, accurate, appropriate, understandable, accessible and timely will enable personnel in the organization to manage, conduct and control operations (Abiola & Oyewole, 2013). According to Badara and Saidin (2013) identification, recording and communication of relevant information within the time frame and in a form stipulated must enable employees to undertake their responsibilities. Communication of information can reduce the risk of fraud. Lack of proper safe means of receiving and disseminating information to the relevant authority for action increases cases of non-reporting of suspicious activities that leads to fraud (Hayali, Dinc, Sarili, Secil, & Aysel, 2013). Information sharing is an important tool for alerting the concerned parties about any suspicious activity and fraud prevention. The shared information by reserve or central bank about methods of operations in case of fraud cases reported help in identifying loopholes, initiation of corrective measures and encourage review of guidelines (Chakrabarty, 2014).

Monitoring is the evaluation of the events and transactions of the organization to determine whether performance of the organization is qualitative and to check effectiveness of the controls. Monitoring involves all management oversight of the ICS (Etengu & Amony, 2016). COSO (2013) stated that combination of continuous evaluations and separate evaluations or either can be used to assess the presence and functionality of ICS components. Assessment of ICS can also be done through internal and external audits to determine the effectiveness of ICS (Kumuthinidevi, 2016). The ICS requirement in banks is vital due the fact that banking sector plays very important role in development of economy in any country. Most countries are faced by instabilities in macro-economics, slow real economic growth, risks of fraud and corruption. The ICS

in banks can reduce these vices that affect the economy negatively (Kumuthinidevi, 2016).

The staffs have responsibilities of evaluating different systems of internal controls and where there are loopholes they should be sealed. Any discovered weaknesses must be addressed with speed and later incorporated in the overall systems of internal control (Abiola & Oyewole, 2013). By monitoring, internal control activities are continuously kept under strict watch and their performances are assessed. This is what the whole organization should engage in, indicating that fraudulent actions are revealed and dealt with soonest possible. Where an organization lacks proper evaluation mechanisms of its own policies and frequent revision of it practices, the organization risks being defrauded by employees who are used to the practices and who might find a way to conceal their fraudulent activities (Hayali et al, 2013).

1.1.2 Fraud Prevention

Fraud is the act of denying an individual something which such an individual is or would be entitled to in a dishonest manner. Fraud may include and not limited embezzlement, thievery or any action involving stealing or unlawfully obtaining or misusing the assets and manipulation of financial statement for personal gain (Okonkwo & Linda, 2016). Fraud is manifested globally and differs in magnitude in both developing and developed countries. Fraud leads to loss mostly in monetary form in businesses and economies of countries; it may also affect administration and developments in countries (Odi, 2013). Fraudulent intentions of individuals to acquire things they may need and do not have may be influenced by the environment the individuals find themselves in (Kristo, 2011). Perpetrations of financial frauds in banks have continued despite of controls put in place to prevent and control the acts of stealing.

The controls are sometimes compromised by the employees in order to defraud the institutions (Adetiloye, Olokoyo & Taiwo, 2016). Fraud should be examined, studied and attributed to many factors and multifaceted approaches to study fraud should be

applied. One should mainly focus on the opportunities to commit fraud, motivational factors, rationale of committing crime, technical ability and suitability of the target (Sharma & Sharma, 2017). Fraud in banks affects the stability and credibility of the banks negatively causing distress. Frauds negatively affect the performance of banking sector and economy as a whole (Odi, 2013),

Prevention is the proactive process of ensuring that the fraudsters do not commit fraud. Fraud prevention is meant to hinder fraudulent activities from taking place (Koech & Kimani, 2018). Fraud prevention acts as cost effective defence mechanism to stop perpetration of fraud (Othmana, Arisb, Mardziyaha, Zainanb, & Aminb, 2015). Every organization regardless of size must have plans to prevent fraud (Wang'ombe, Kiragu & Kamau, 2019). Banks must refocus on fraud prevention to ensure that investigations on fraud cases are effective (Bhasin, 2016). Collaboration between the customers and financial institutions can build a very effective partnership to prevent fraud (Bhasin, 2016). Controls on fraud prevention are meant to mitigate cases of fraud occurrence (Kyalo, Kalio & Ngahu, 2014).

Fraud prevention involving customer may be prevented by communicating the anti-fraud policies (Hoffmann & Birnbrich, 2012). Gibson (2018) postulated that fraud can be prevented by introducing training on ethics and maintenance of code of conduct, ensuring that all unusual behaviours especially during financial pressure (red flags) are pinpointed, having controls such as whistle blower policy was also instrumental to unearth fraud cases and ensuring that the organization maintains risk registers to be used as a guide on activities that may point out fraudulent activities. Continuous evaluations and strengthening policies established were found to be vital. Internal checks that are functional, efficient and effective, proper reporting modalities and proper restrictions to data access can be very vital in fraud prevention (Abiola & Oyewole, 2013).

1.1.3 Relationship between Internal Control System and Fraud Prevention

Financial crises that organizations have experienced in recent past especially financial institutions or firms, have clearly shown that organizations have ineffective or imperfect

risk-management and internal control practices (Ali, 2013). International Federation of Accountants (IFAC) indicated that previously, many organizations focused on financial reporting controls until many more financial crises arose (IFAC, 2012). Tunji (2013) noted that collapse of ICS in any organization will lead to the failure or suffering of the organization. Karagiorgos, Drogalas and Dimou (2013) in their research indicated that the bank failures have mostly been due to fraud. Basle committee analysed the situations leading to bank failures and it observed that the failures and losses in banks could have been avoided had the banks maintained strong ICS. Karagiorgos et al (2013) in their research observed that strong ICS are pertinent to the banks due to their susceptibility to fraud. Similarly banking sector in Nigeria has suffered a lot due to mismanagement resulting from either lack of adherence to laid down principles and policies that have been established by the management or lack of ICS (Ifeanyi, Adejanju & Olagunju, 2011). Some banks in Kenya have ceased operations and others are managed under statutory mandate because of frauds connected to weak or undermined ICS, latest cases being Imperial and Dubai banks (Gesare, Nyagol & Odongo, 2016).

The firms must enhance internal controls in order to prevent fraud. The organizations regardless of their operations must be proactive in fraud prevention and should put in place rigorous additional controls to curb fraud (Bhasin, 2016). In case there are no proper controls or programs established by the organization to deal with fraud, experts can be engaged to eliminate fraud (Wang'ombe, Kiragu & Kamau, 2019). Fraud prevention entails proper segregation of duties, proper supervision of work as well as monitoring the performances (Mpaata, Lubogoyi & Okiria, 2017). The proper organizational culture and engaging employees fairly besides laying down proper policies and procedures can prevent fraud in organizations (Wang'ombe, Kiragu & Kamau, 2019). Creative fraudsters makes investment in fraud prevention wasteful, however where fraudsters employ common tricks, it would be prudent to employ competent professionals who can be able to mitigate fraud occurrences (Aliabadi, Dorestani & Qadri, 2011)

1.1.4 Banking Sector in Kenya

European Investment Bank (EIB) (2013) indicated that Kenya as a country has the most elaborate banking and financial system in the wider Eastern Africa. Kenya's banking sector is ranked fourth in size as compared to other in sub-Saharan African countries. Kenya as a country has 43 registered commercial banks, of which thirteen are foreign. Commercial banks in Kenya have expanded to about 1,161 branches within the country (Akelola, 2015). In East Africa, Kenyan banking sector is the only one that has substantial banking activities abroad, these banking activities are mainly established in neighbouring countries. In expanding businesses, around ten Kenyan banks have established branches in the neighbouring countries, around 223 branches have been established in larger Eastern Africa. In addition, the central bank licensed six deposit-taking microfinance institutions (EIB, 2013). Kenyan banks are supervised and controlled by CBK, based on the guidelines provided by Basel Committee. Regardless of these supervision and control, frauds in banks are on the rise. In exercise of its supervisory and control powers anchored in Central Bank Act and Banking Act, the CBK closed and put three commercial banks under statutory management. These banks were Charterhouse Bank Limited, Dubai Bank Limited and Imperial Bank Limited (Ogola, K'Aol & Linge, 2016)

1.2 Statement of Problem

Fraud that affect banking sector and business organizations in Kenya has been on the rise, despite establishment of various measures to mitigate fraud. The rise in fraud has been a point of concern to the stakeholders (Mwithi & Kamau, 2015). Kenyan banking sector is the most susceptible to banking fraud in the entire East Africa (Kabue & Aduda, 2017). Kenya as a country has experienced a raft of fraud cases in the near past. A survey carried out by PWC (2016), reported that economic crimes incidences in Kenya rose from 52% to 61% between 2014 and 2016. Study by Kabue and Aduda (2017), indicated that Kenyan banks lost Ksh. 1.5 billion in 2016 in the schemes that involved technological conversant employees, this was connected to the failure on the side of employees and banking processes that could not detect and control fraud. Individual Kenyans surveyed by PWC indicated that they have lost between Sh. 2.5 M and Sh. 500M through fraud and other economic crimes between 2016 and 2018 (PWC, 2018). Akwaa-Sekyi (2016)

studied internal controls in European banks and found them to be effective. Adetiloye, Olokoyo and Taiwo (2016) studied the fraud prevention in banking system in Nigeria and they concluded that the ICS is effective in fraud prevention in Nigeria. Amudo and Inanga (2009) undertook study on that evaluated ICS in AfDB in Uganda. The study by Owusu-Boateng, Amofa and Owusu (2017) focused on a single bank in Ghana and it was concluded that the ICS was able to prevent fraud in credit department of the bank. The aforementioned studies were from different jurisdictions and therefore created a gap in Kenyan banking sector. Akelola (2012), studied fraud in the banking sector in Kenya which found that fraud is still endemic in the country especially in banking sector. Ndege, Odhiambo and Byaruhanga (2015), studied how internal controls can be used to detect and prevent fraud in district treasuries. The study findings indicated that there existed significant relationship between ICS and fraud detection and prevention. This study sought to fill the gaps identified by establishing the effect of internal control system on prevention of fraud in banking sector by studying all banks that are registered and operating in Kenya.

1.3 Objectives

The study utilised both general objectives and specific objectives.

1.3.1 General Objective

To establish the effect internal control system has on fraud prevention in banking sector in Kenya.

1.3.2 Specific Objectives

The study was guided by the following specific objectives;

1. To determine the effect of control environment on fraud prevention in banking sector in Kenya.
2. To assess the effect of risk assessment on prevention of fraud in banking sector in Kenya.
3. To evaluate the effect of control activities on fraud prevention in banking sector in Kenya.
4. To determine the effect of communication of information on prevention of fraud in banking sector in Kenya.

5. To establish the effect of monitoring of activities on fraud prevention in banking sector in Kenya.
6. To establish the moderating effect of compliance with prudential regulations on the relationship between the ICS and fraud prevention in banking sector in Kenya.

1.4 Research Hypotheses

H_{01}: Control environment has no significant effect on fraud prevention in banking sector in Kenya.

H_{02}: Risk assessment has no significant effect on fraud prevention in banking sector in Kenya.

H_{03}: Control activities have no significant effect on fraud prevention in banking sector in Kenya.

H_{04}: Communication of information has no significant effect on fraud prevention in banking sector in Kenya.

H_{05}: Monitoring of activities has no significant effect on fraud prevention in banking sector in Kenya.

H_{06}: Compliance with prudential regulations has no moderating effect on the relation between ICS and fraud prevention in banking sector in Kenya.

1.5 Justification of the Study

The research findings are deemed to be relevant and crucial to the management of these institutions. The study findings are expected provide the management with vital and relevant information that can be utilized to enhance those areas of ICS that may be weak. The findings from this research would be of importance to the government and bank regulators as it would offer guidelines on appropriate laws to be enacted in order to safeguard stakeholders' interests, provide information on effective regulations and also provide information on whether laws and regulations are being followed as stipulated. The investors and potential investors in the banking sector are also expected to benefit from the study findings as they would be able to judge whether their investments or intended investments would be protected by the management. The research findings are expected to benefit scholars who would carry out research studies on the same area. Finally the study findings are expected to benefit the policy makers on ICS as they would find those critical areas that require improvement and the areas that would require review.

The research will be adding to the bank of knowledge in the field of ICS and be used to strengthen the ICS.

1.6 Scope of the Study

The study was limited to the headquarters of all banks registered and operating in Kenya. The headquarters of all banks in Kenya are situated in Nairobi County. The study focused on the effect of ICS on fraud prevention and was based on all components of ICS which include control environment, risk assessment, control activities, communication of information and monitoring. The study involved branch managers, operations managers and cash managers or supervisors as respondents.

1.7 Limitations of the Study

The main limitation of the study was none availability of certain information (financial statements and investigation reports) that was deemed important for the research and was not available to public. The custodians of the information were reluctant to disclose. The researcher explained the importance of the information in the research. Further the limitation was addressed by convincing the custodians of information by first producing introductory letter from the university, the research certificate from NACOSTI and finally the letters from county commissioner and county director of education that confirmed that the research was for educational purposes. The second limitation was difficulty in determining the appropriate respondents to the research questions. Banks have different senior personnel with different responsibilities and authority, therefore the choice of respondents was painstakingly difficult. This limitation was dealt with by ensuring that the researcher was well conversant with duties and responsibilities of each senior officer in the bank. This was undertaken by reviewing documents that are used by human resource to recruit various cadres of personnel.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter captures different theories related to the study. The chapter reviews literature related to fraud prevention the dependent variable of the study, independent variables that include; control environment, risk assessment, control activities, communication of information, and monitoring and compliance with prudential regulations as moderating variable. It also includes the conceptual framework that guides the study, the summary of empirical studies and finally the research gaps from various studies.

2.2 Review of key Theories

The study was guided by agency theory, fraud management theory, fraud triangle theory and fraud diamond theory.

2.2.1 Agency Theory

Agency theory used in the study was coined by Jensen and Meckling (1976). This theory is an economic concept that explains variation in behaviour or decisions of members of the same group. It is concerned with solving the problems that exist in agency relationship. In an agency there exist relationship between two parties the appointer (principal) and an appointee (agent) who is expected to act on behalf his/her appointer on different matters. Agency relationship will arise when one or more people employ another(s) to provide a service and even delegate the decision-making authority to him or her. The agent has a responsibility to optimize the benefits of the principal as well as have interest in maximizing his welfare (Daniel, 2013). Agency theory describes firms as structural necessity in maintenance of contracts and controls in the firms to reduce chances of the agents taking advantage of the principal. The management as the agents may face dilemma on how they would maximize their own interest without necessarily going against the owners of the business. However, this dilemma may be addressed by the ICS (Asiligwa, 2017).

Agency theory is used to analyse and understand the behaviour of the people mandated to make personal and economic choices. The theory is also used to analyse cooperating behaviour of the economic actors in order to achieve organizational goals. The dilemma for the agent is whether to maximize his own benefits or to work towards maximizing his own personal interest and that of the organization (Nwofia, 2018). Agency theory has been found to deal with the conflict between principal and the agent, the agency costs and interests of principal and agent. The theory should be expanded to address the motivation behind the behaviours of principal and agent, the principal's and agent's attitude towards risk besides time preference (Panda & Leepsa, 2017). This theory is used due to the fact the managers are the custodian of ICS and they do so to safeguard the assets of the shareholders or owners of the banks. The branch managers, operations managers and the cash supervisors in banks are custodian of ICS in banks at various levels of management within organization. Thus, the theory was found suitable for this study

2.2.2 Fraud Management Lifecycle Theory

Fraud management lifecycle theory was developed by Wilhelm (2004). The theory defines fraud management lifecycle "as a network where each stage is a sum of elements made up of interrelated, interdependent and independent actions, operations and functions that help in fraud control" (Njenga & Osiema, 2013). In order to have an effective management of fraud, the management lifecycle normally begins with clear definition and understanding of various stages within fraud management lifecycle to enable professionals to communicate more effectively with the shareholders and others involved in the industries, within their businesses and among themselves (Wilhelm, 2004). The eight stages of fraud management lifecycle start with deterrence. Deterrence involves actions and activities that are necessary to stop or thwart any attempt to defraud. This stage ensures that the fraud is prevented or stopped long before it is perpetrated by creating fear or consequences or making it impossible or difficult to attempt fraud (Kimani, 2011).

Detection involves fraud testing, fraud attempts and fraud successes (Ijeoma & Aronu, 2013). This stage should all ensure that fraud attempts and successful frauds are revealed.

Prevention involves activities put in place thwart attempts of fraud or to protect the organization and the processes therein against fraud perpetration (Kimani, 2011). The understanding of this is that not all attempted frauds are successful and all attempts are neither expected to succeed but are meant to test the controls (Njenga & Osiema, 2013). Fourth stage in lifecycle entails mitigation of fraud; mitigation in fraud entails stopping fraudster from committing fraud or finalizing their fraudulent mission and hence reduces their odds of success (Wilhelm, 2004). Mitigating activities may be undertaken with urgency or may be deferred. Mitigation in fraud entails actions that are meant to minimize extent of the fraud, cut amount of losses incurred during fraud, efforts and expenses required to compensate or reverse impact of the fraud (Wilhelm, 2004). In case of identity theft and fraudulent activities involved in identity theft, fast detection and mitigation activities initiated, will reduce the effort, time and resources that may be required to reverse the consumer's credit record (Njenga & Osiema, 2013).

Mitigation stage lead to analysis of fraud which requires identifications and understanding of losses incurred regardless of the efforts engaged in deterrence, detection, prevention, and mitigation stages of fraud lifecycle (Njenga & Osiema, 2013). The analysis stage is meant to provide information on the initial causes and factors that led to the fraudulent activity (Akelola, 2012). Analysts give assessment report in mitigation concerning measurements of activities performances in completely acting on fraud detection alerts to minimize losses incurred due to frauds. Fraud policy is a statement that stipulates organization's attitude towards fraud, it helps employees to comprehend fraudulent activities and also explains the actions to be undertaken in case of suspicious activities. It involves development of policies, evaluation of these policies and communication to employees to try to reduce the fraud cases in organizations (Ina, 2016)

Policy development involves three different aspects; coming up with the policy, evaluation and ensuring that everyone is aware of policies developed in order to reduce chances of fraudulent activities occurring and reducing the actual fraud (Akelola, 2012). The investigation stage majorly entails obtaining enough evidence and information to curtail fraud, ensuring that stolen assets are fully recovered or given back to rightful

owners besides providing enough evidence to improve on success of providing evidence to court and jailing or punishing of the perpetrators (Njenga and Osiema, 2013). Fraud investigations focus mainly on investigations within the organization, investigations outside the organization and coordination with law enforcers. Investigations within the organization will involve investigations of workers and individuals trading with organization such as contractors, consultants or vendors while investigations outside the organization entails investigating customers, fraudsters and organized groups (Wilhelm, 2004).

Fraud management lifecycle ends in provision of evidence in court. Prosecution is defined as "the institution and conducting of legal proceedings against someone in respect of criminal charge" (Oxford dictionary). Chepkoech and Rotich (2017) stated that prosecution of perpetrators of fraud is mainly meant to deter attempts or commission of fraudulent activities and restitution of the wronged person through punishing the perpetrators of fraud. Prosecution also intends to ensure that the established reputation of the organization is maintained and enhanced by discouraging fraud, through ensuring that perpetrators are successfully apprehended, prosecuted and punished. It is the last stage that culminates to success or failure of other stages of fraud management lifecycle. These actions on the fraudsters should be made public in order for potential fraudsters who might target the organization become aware that no such action will go unpunished. The prosecution also intends to recover the stolen resources or assets and where possible compensate the aggrieved parties (Ina, 2016).

Fraud management theory assumes that there are fixed ways or methods that can be used in controlling or managing fraud. The stages may be effective, may not be conclusive and are not the only way that can control fraud. These stages of fraud management lifecycle do not necessarily occur in a linear manner as postulated by the proponents of the theory (Ijeoma & Aronu, 2013). Chepkoech and Rotich (2017) took issue with the claim that the prosecution of fraudsters was because of success. The researchers argue that there is no success as the fraud has been committed. Many organizations do not follow such rigid process in the management of fraud. In some cases, internal control systems (ICS), fair

remuneration, ownership option and proper training can also be used as proper mechanisms of addressing the problem of fraud in the organization. If the employees are fairly remunerated, they will not have a motivation to commit fraud. Stronger ICS can also be used as a deterrent in committing fraud. Employee stock ownership plan can also be used to manage fraud as the employees can be convinced that they are also co-owners of the company and so they can safeguard the assets of the company. The fraud lifecycle theory has been used to show chronologically the stages that management may follow until the perpetrator is convicted for the crime. These stages are relevant to the management as they can forestall fraud long before the actual perpetration.

2.2.3 Fraud Triangle Theory

This theory was developed by Donald Cressey in 1973. Fraud triangle theory enlists reasons that are perceived to push fraudsters to commit fraud. Fraud triangle gives three major factors that must be present in any fraudulent situation. These factors are listed as; perceived pressure, opportunity and rationalization. Fraud cannot occur in situation where perceived pressure, opportunity and rationalization are not present and the gravity of fraud is dependent on the strength of the mentioned elements (Ruankaew, 2013). The theory indicates that in case of fraudulent activity, the fraudster must have a motive or an incentive that makes him commit the crime. The motives may be different depending on the perpetrator. The motive may be prevailing circumstances or lack of something that the perpetrator may deem to be important (Akelola, 2012).

Pressure has been categorized into corporate and personal or individual pressures. The corporate pressure may include unrealistic or unreasonable targets for employees and job insecurity. The individual pressure includes lack of financial discipline, maintaining certain social status, family financial difficulties and addictions to certain demanding commodities. Pressure can also be categorized as positive, this category is where goals are achievable and therefore, employees become creative, they increase competitiveness and efficiency improves. Negative pressure may be due to unattainable goals (Price Waterhouse Coopers (PWC), 2018). This pressure may be brought by obsession with achievement of goals regardless of the cost. This becomes destructive and leads to people

engaging in fraudulent activities (Abdullahi, Muhammad &Nuhu, 2015). PWC (2018) indicated that in order to address the pressures affecting the employees, organizations must prioritize or perceive to prioritize both financial and psychological welfare. Publicizing and practicing open door policy that enables employees to air their grievances freely may reduce pressure on employees.

The theory states existence of opportunity may make perpetrator to commit fraud. Opportunity to commit crime may arise where the employee notices some gaps in enforcement of rules and regulations and controls. These gaps make the perpetrators gain confidence that the fraudulent activities will not be detected or even traced back to them. Lack of separation of activities, lack of clear guidelines and policies and poor or no enforcement of policies are some of gaps that exist and which give opportunities to fraud perpetrators (PWC, 2018). Abdullahi, Muhammad and Nuhu (2015) indicated that the aspects of opportunities are weaknesses within the organization that makes manipulation easy and ideal conditions in the organization to perpetrate fraud. The motivation to commit fraud cannot succeed in fraudulent situation unless an opportunity is present. Opportunities in the organization are created by breaching policies, rules regulations and procedures by employees, negligence also creates opportunity and weak or lack of punishment or action towards perpetrators of fraud may also create an opportunity to commit fraud (Kiprono & Ng'ang'a, 2018).

Lastly the rationalization is used by the perpetrator to commit fraud. The fraudster may convince himself/herself that there is a good reason to commit fraud, for example one may argue that he/she works so hard and is paid less or the cost of being caught will be less than the benefits he will derive from the fraud (Akelola, 2012). Rationalization or justification of committing fraud may be due to the feeling that the employee is being cheated by the employer (Kiprono & Ng'ang'a, 2018). Besides justification, some fraudsters may have attitude and ethical issues that enable them to commit fraud intentionally and knowingly (Abdullahi, Muhammad & Nuhu, 2015). PWC (2018) suggests that organizations should focus on the environment in order to identify those areas that create opportunity to commit fraud and strengthen them. It is further advised

that constant and regular training about the acceptable behaviours and the punishment that follows failure to adhere to the regulations must be adopted to address rationalization. Abdullahi, Muhammad and Nuhu (2015) indicated that strong moral and ethics code can be used to ensure that employees are not able to justify their fraudulent activities.

Fraud triangle theory has focused on three aspects of pressure, opportunity and rationalization as factors attributable to fraud perpetration, however, pressure and rationalization are not observable and as such cannot be used in fraud prevention and should be replaced by integrity (Kassem & Ligson, 2012). Fraud triangle theory indicates the perceived causes for an individual to commit fraud. This theory is therefore relevant to the study as it establishes those reasons that may push a person to commit fraud. Based on the analysis of the factors that create environment for people to engage in fraudulent activities, those areas of the organization's regulations or actions that create opportunities to commit fraud and the reasoning that justifies employees' dishonest behaviour, the organization can establish proper mechanisms that would effectively address the employees' concerns and reduce cases of frauds.

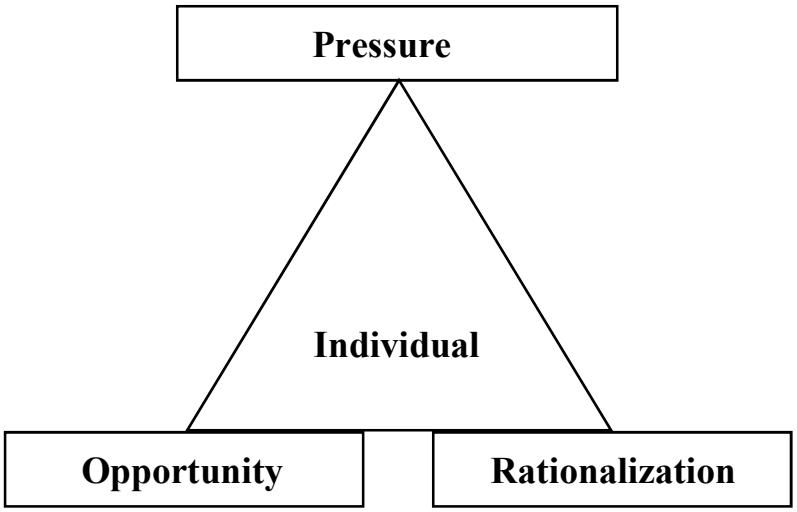

Figure 2.1: Fraud Triangle (Adopted from Cressey, 1973)

2.2.4 Fraud Diamond Theory

Fraud diamond theory was developed by Wolfe and Hermanson in 2004 and is generally viewed as an expansion of fraud triangle theory. According to the proponents of this theory, the fraud triangle has been useful to accountants seeking to understand and manage fraud. However, it was necessary to enhance the theory by introducing the individual's capability (Wolfe & Hermanson, 2004). Abdullahi, Muhammad and Nuhu (2015), in their study stated that though incentive, opportunity and a rationalization to commit fraud may exist or coexist, it is difficult for fraud to be committed unless there is capability to do so. Fraud diamond theory states that, presence of opportunity, motive and rationalization does not guarantee the occurrence of fraud. Wolfe and Hermanson (2004) stated that capabilities are personal traits and abilities that may play a role in whether the fraud will be committed or not even in the presence of incentive, opportunity and rationalization. Capability to commit fraud is vital for the fraud to be perpetrated. The proponents of the theory listed four elements of capability. These elements include; first, the rank or duties of a person within the organization may present chance to create or exploit an opportunity to commit fraud. Secondly, the right person to commit fraud must be smart or intelligent. The person must understand the weaknesses of the internal controls and has capability to exploit these weaknesses (Abdullahi et al, 2015).

Thirdly the right person must have a lot of confidence that he will not be caught or detected and egocentric. The person believes that he can talk himself out of trouble easily. The fourth element of capability is presented as ability to force other employees to commit or hide fraud. Such a person is capable of persuading others to enable him to convince others to commit fraud or to ignore the committed fraud (Wolfe & Hermanson, 2004). Wolfe and Hermanson (2004), indicated that most of multibillion-dollar frauds would not have been committed if there were no people with right capabilities and in the right position. The theory has been used in the study as it is an enhancement of fraud triangle theory by including capability. Kassem and Ligson (2012) stated that though capability was added to fraud triangle theory to enhance it, unobservable elements of pressure and rationalization should be replaced with integrity

and motivation to form a new model. This theory is relevant as it may assist the management to put in place controls and measures that will counter any fraudulent activity from those who may be in position of influence.

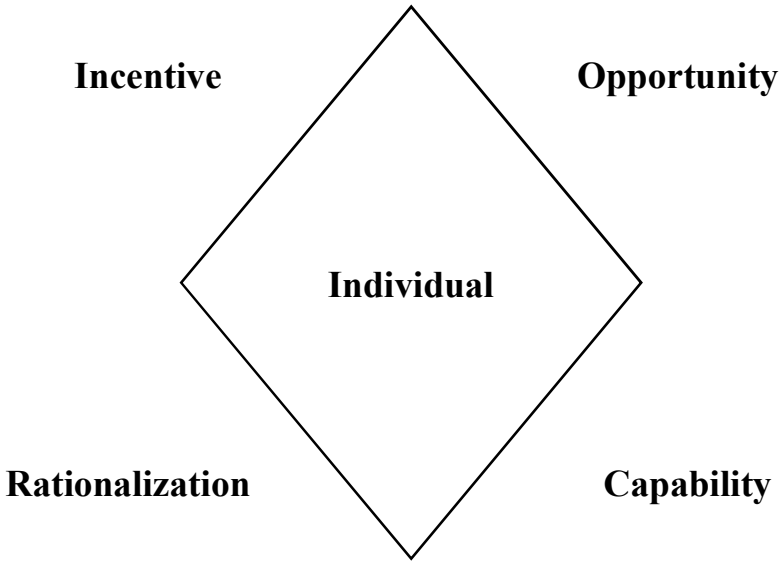

Figure 2.2: Fraud Diamond (Adopted from Wolfe and Hermanson, 2004)

2.3 Empirical Review

The Commission of Sponsoring Organization (COSO) defined the internal control "as a process, effected by the entity's board of directors, management and other personnel designed to provide reasonable assurance regarding achievement of objectives in effectiveness and efficiency of operations, reliability of financial reporting and compliance with applicable laws and regulations" (COSO, 2010). This definition shows that internal controls create a basis of amount of work needed to be done by the professionals charged with this responsibility, as they are expected to ensure that organization's funds are safeguarded, ensure that there is strict and effective management of assets and that financial statements are accurate, truthful and unbiased at all time (Campbell & Harther, 2010).

The definition is used as the basis of the study as it conforms to the agency theory. The management is contracted as agent by the shareholders who act as principals to safeguard

their properties. The management therefore is the custodian of the ICS in the organization. The ICS incorporates policies, mechanisms and techniques that the management design to ensure that the assets of the organization are safeguarded, proper standards are put in place while preparing financial statements as well as adherence to laws and regulations. ICS is established to facilitate achievement of goals in the firm, missions and aims are accomplished, though, ICS does not guarantee the management that those objectives can be met absolutely (Agbenyo, Jiang & Cobblah, 2018). Bangsa (2018) stated that ICS plays an important role in fraud detection and prevention, as it is used to estimate organisation's resources, monitor how the resources are utilised and direct how the resources should be utilised. The ICS is majorly used to improve the performance of the organization and financial accomplishments (Agbenyo, Jiang & Cobblah, 2018).

Internal Control System in banks is important as the banks play crucial and critical role in the development of economy of a nation. The development in the economy can be hindered by macro-economic instabilities, corruption fraud and slowed real economic expansion. Strong and effective ICS in banks can address the aforementioned hindrances of the economic development (Kumuthinidevi, 2016). ICS's effectiveness can be determined if, in the assessment of ICS components that include; control environment, risk assessment, control activities, communication of information, and monitoring are found to be present and working properly (COSO, 2013). An ICS that is effective and efficient will enable the organizations to operate without irregularities in that the financial statements produced will be of high quality. The effectiveness of ICS can be achieved if all the employees of the organization can prioritize the organization's interest above their own personal interest (Bangsa, 2018).

2.3.1 Control Environment

Control environment are factors which determine whether policies, procedures and methods are effective for a particular process. Control environment forms the basis of the management's understanding of the organization, the attitude towards problems facing the organization, mechanisms they put in place to address problems and the emphasis on

moral values in the organization (Okonkwo & Linda, 2016). Price Water House Coopers (PWC) (2012) indicated that, the control environment entails all the functionalities of management and governance, the attitudes, alertness and actions of those entrusted with responsibilities of governing and managing internal controls and their importance in the organization. Control environment is improved by enacting policies that govern human resource and procedures that are effective. The human policies should be able to cater for competitive hiring of personnel, induction and training of new employees, evaluation of work done, fair compensation and promotion of deserving employees and application of corrective rather than punitive disciplinary actions (Ifeoluwa, 2017). Agbenyo, Jiang and Cobblah (2018) observed that control environment defines the organization structure that shows the flow of authority which determines the duties allocated to employees, moral esteem, integrity, state of mind of employees and the management styles.

Control environment is used to regulate the risks and define the supervisory roles of those mandated with the responsibilities. The effectiveness of control environment can be eroded by assigning superficial roles of supervising others (Rafindadi & Olanrewaju, 2019). Kumuthinidevi (2016) stated that control environment indicates the awareness, attitude and the importance the management and governing board of banks consider in assigning control activities. The control environment shows the level of discipline and organization structures put in place by management and governing board of banks to ensure that the ICS operate properly. The effectiveness of control environment is measured by the size of the board and it is deduced that a large board will ensure effective control environment (Akwaa-Sekyi & Rene, 2016).

The study carried out by Jiang and Cobblah (2018) on Assessment of Government Internal Control Systems on Financial Reporting Quality in Ghana found that, the influence of control environment was negative, weak and insignificant on the quality of financial reporting. Thao (2018), studied effectiveness of the internal control system in the private joint-stock commercial banks in Thai Nguyen province, Vietnam. The findings in this study showed that control environment has weak positive effect on ICS in private joint –stock commercial banks. Kumuthinidevi (2016) studied the Effectiveness of the Internal Control System in the Private Banks of Trincomalee. In this study it was

concluded that control environment within private bank moderately support the level of effectiveness of ICS. Gesare, Nyangol and Odongo (2016) studied influence of internal control systems on fraud risk management in banks in Kisii town. In this study it was found that that control environment has a significant positive influence on fraud risk management in banks in Kisii town. This is an indication that improvement in the quality of the control environment likely leads to improved fraud risk management in banks. Etengu and Amony (2016) studied the Internal Control System and Financial Performance in Non-Governmental Organisations in Uganda: A Case Study of International Union for Conservation of Nature, the study findings showed that control environment significantly affect financial performance. Amudo and Inanga (2009) studied evaluation of ICS and they found that control environment was not effective and efficient in providing reliable financial reporting. The above studies gave conflicting results and as such it was important to establish the truth by carrying out research in the area.

2.3.2 Risk Assessment

Every entity is exposed to a variety of risks from within and without the organization. Risk is defined as the possibility of occurrence of an event that will negatively affect the attainment of organizational objective. Therefore, risk assessment lays ground for determining risk management strategies (COSO, 2013). Risk assessment refers to identification of conditions or factors that may hinder the achievement of the organization's goals and objectives. It entails identification and analysis of potential errors and also implementation of controls, policies and procedures in order to reveal those errors and try to prevent their commission (Okonkwo & Linda, 2016). Risk assessment is meant to determine the exact kind of risk the organization face, the kind of controls that should be put in place to address the risks identified and also to manage the risks that have been identified (Kumuthinidevi, 2016).

The economic, industrial, operating environment and conditions of operations are changing constantly, this means that potential risks are also changing. Therefore, it is prudent that the management put in place mechanisms that will be able to identify, assess

and quantify changing risky environment (Olanrewaju & Rafindadi, 2019). Risks do not remain constant and they keep on changing over time, therefore it is important to establish mechanisms that are capable of dealing with factors that give rise to changes in risks which include; change in accounting standards or practices, engagement of new staff, mergers of businesses or firms, change in the operating environment of the business, changes in the information system for capturing and dissemination of information, growth rate of the organization and increased or expanded product range (Kumuthinidevi, 2016).

Risk appraisal is an effective procedure that can be used for judging the environment and occasions to understand whether the environment and occasions are friendly or otherwise to risk and also the chances of the risk occurring (Agbenyo, Jiang & Cobblah, 2018). Gesare, Nyangol and Odongo (2016) indicated that risks are both internal and external. The risks organizations face are not always avoidable, therefore organizations must make decisions whether to reduce risk to manageable levels or to accept the risk. The management must ensure that the risks that have been detected are handled professionally to ensure that they do not derail the organization's goals or objectives. The expertise and the experience of governing board and management of banks, the ability of the management to identify, monitor and eventual measurement and evaluation of risks may be vital in mitigating chances of risk occurrence (Akwaa-Sekyi & Rene, 2016).

The findings by Thao (2018) in his study indicated that risk assessment has moderately and positively affected ICS in private joint –stock commercial banks. Jiang and Cobblah (2018) in their study concluded that risk assessment had a significant and positive influence on the quality of financial reporting. Gesare, Nyangol and Odongo (2016) also concluded that there is significant positive relationship between risk assessment and fraud risk management. This meant that the risk assessment quality has direct effects on fraud risk management quality. Amudo and Inanga (2009) in their study indicated that the risk assessments put in place by African Development Bank (AfDB) were not efficient to address the problems in projects initiated. The conclusion derived by these studies

showed clearly there are disagreements in conclusions, therefore, this study was necessary to clearly establish the correct position.

2.3.3 Control Activities

Commission of sponsoring organization defined control activities as procedure and policy supported actions that can mitigate or manage risk when taken on timely manner and properly. Control activities are undertaken at various stages and all levels of the business practices (Mathew, 2011). Control activities include the procedures and policies that are established to make sure that directives issued by the management are adhered to. These controls are established across the organization, in all levels and functions. Control activities are established to ensure the organization's objectives are fulfilled by addressing risk that the organization might be exposed to (Ifeoluwa, 2017). Control Activities incorporate strategies, policies, standards and choices made by the managers to anticipate and mitigate risks that would hinder the organization's goals accomplishment (Agbenyo, Jiang & Cobblah, 2018).

Control activities should be established in all functions, throughout the organization and at all levels of management to ensure that the organization is able to deal with potential risks (Olanrewaju & Rafindadi, 2019). Control activities in banks are divided into operational controls which are meant to ensure that the budgeted and actual performance have not deviated significantly, the information processing controls are other forms of controls which are established to ensure that the transactions are complete, accurate and properly safeguarded. Information control activities are also used for protecting the servers and data centres operations. The other control activities are physical control and segregation of duties. The employees should be assigned different duties in a single bank activity or transaction to prevent them from concealing an irregularity or illegality (Kumuthinidevi, 2016). Gesare, Nyangol and Odongo (2016) stated that control activities are the best preventive ICS component that can ensure that there is no perpetration of wrongs within the organization, however they emphasised that this can only happen in presence of disciplined and responsive management information system. Control activities should be based on general operations as well as technology policies. Controls should be able to

determine the levels of acceptable risks through checks, balances and policies. Control activities are concerned with precautionary mechanisms (Akwaa-Sekyi & Rene, 2016).

In the study carried out by Akwaa-Sekyi and Rene, (2016) titled internal controls and credit risk relationship among banks in Europe, it was concluded that bank control activities were able to significantly minimize the credit risks. Okonkwo and Linda (2016) studied Internal Control Techniques and Fraud Mitigation in Nigerian Banks, the study found the control techniques that have been employed are effective in mitigating fraud in banks. The study by Etengu and Amony (2016) found that control activities significantly affect financial performance. Owusu-Boateng, Amofa, and Owusu (2017) studied Internal Control Systems of GN Bank- Ghana and the study concluded that control activities that were established by the board and management were able to reduce and adequately address the risk problems in the bank. Control activities that had been established by the AfDB were not functioning properly to detect frauds in projects initiated (Amudo & Inanga, 2009). The study by Agbenyo, Jiang and Cobblah (2018), found that control activities' influence on financial reporting quality was positive though insignificant statistically. The findings of the reviewed studies were conflicting and confusing. Therefore, it was prudent to question the validity of the assertions by carrying out further study.

2.3.4 Communication of Information

Communication is a process that is continuous and interactive for obtaining, provision and dissemination of vital information. Communication within the firm is the mechanism through which information is passed on within the organization (COSO, 2013). Communication creates good working relationship within the organization. In order for communication to be effective, it must be flowing in all directions effortlessly. It is argued that authenticating information without ensuring that the information is passed through safer channels will defeat the purpose of such information (Olanrewaju & Rafindadi, 2019). Information is very vital in enabling the organization to undertake internal control activities and responsibilities that support achievement of organizational objectives. The management receives information from within and outside

the firm. If the information received by the management is relevant and of high quality, it is used to support proper working of other elements of internal control system. Badara and Saidin (2013) stipulated that, the organization must identify relevant information; this information should be recorded and disseminated in a state and within time stipulated so that it will enable concerned parties undertake their responsibilities properly. Effective communication entails information flow to and from and across the entire organization on timely basis and in right form to facilitate operations. Employees must receive clear and relevant messages from high level managers so that responsibilities to control can be taken seriously. Roles of each employee in the internal control system must be clearly understood, as well as how their activities affect work of their colleagues.

Information communication can mitigate risk of fraud by ensuring that likelihood of hiding fraud is limited. Accuracy and integrity of information makes it easier to expose fraudulent cases. This means that, a fraudster will not be able to hide fraudulent activity for a longer time. Secondly, an effective and open communication culture in an organization helps to detect any possible case of fraud earlier. Lack of proper safe means of receiving and disseminating information to the relevant authority for action increases cases of non-reporting of suspicious activities that leads to fraud (Hayali et al, 2013). Agbenyo, Jiang and Cobblah (2018), stated that the organization's policies should be communicated clearly and should be complete. The information considered to be important should not be withheld or hidden from employees as this would demoralize them and lead to poor work productivity and loss of trust. Further, the researchers stated that, for an ICS to be effective and efficient, dependable information should be passed to the managers and other employees. The information systems used in banking sector must have both logical and physical security to ensure that the stored information is not lost. Banks are required to have backup for their information to ensure that the operations continue even after loss of original information (Kumuthinidevi, 2016).

The study by Adetiloye, Olokoyo and Taiwo (2016), found that the internet and other communication of information technology improvements in delivery of services in banks have led to increased fraudulent situations in banks. Qualifications and better

remuneration of bank staff were also found to be able to discourage and reduce fraud. Communication of information procedures such as accounting procedures, adoption of technological measures, prevention of technological failures and communication method implemented conveniences around the bank were moderate in supporting the effectiveness of ICS (Kumuthinidevi, 2016). Mwithi and Kamau (2015) on the study titled strategies adopted by commercial banks in Kenya to combat fraud: a survey of selected commercial banks in Kenya found that technology embraced by banks has reduced the cases of fraud as compared with manual operations. Conclusions that were drawn indicated that fraud can be increased as well as reduced by communication of information. This however shows that there is no clear and agreeable position when it comes to this variable. This study therefore drew a conclusion on the right position.

2.3.5 Monitoring of activities

Monitoring of activities is a process that is used to assess the ICS to ensure that it is applied consistently over a long period of time. Monitoring in banks is meant to alert the management on any significant, unexplained and unexpected changes or inconsistencies in the movement of money, the amounts involved and the type of customers to ensure that the activities involved are legitimate (Mwithi & Kamau, 2015). A combination of both continuous and separate evaluations or either of the two can be used to assess the presence and functionality of ICS components. Separate evaluations are conducted from time to time, and they may differ in reach and number of times depending on risks assessment, effectiveness of continuous evaluations, and other management considerations (COSO, 2013). PWC (2012) indicated that any change in the organization or its external environment, will lender the controls implemented earlier to be inadequate in addressing risks in the current period. Changes may also make it impossible to carry out existing controls adequately. The aforementioned changes may include differentiating products and markets, coming up with structural plan, personnel fluctuations, developing better information systems or varying regulatory environment.

The management therefore requires regular management report to help in monitoring these activities on regular basis. Monitoring of activities should be a continuous process

and its scope and regularity depend on the risks assessed and the effectiveness of evaluation mechanisms put in place (Olanrewaju & Rafindadi, 2019). Monitoring of activities are undertaken to establish whether the ICS is properly designed, well executed and whether it is successful (Agbenyo, Jiang & Cobblah, 2018). The staff on the other hand have responsibilities of evaluating various systems of internal control and enhance them where needed. Any discovered deficiencies should be addressed immediately and added to the overall systems of internal control (Abiola & Oyewole, 2013). By monitoring, internal control activities are continuously kept under strict watch and their performances are assessed. The whole organization should be engaged in monitoring, indicating that fraudulent actions are revealed and dealt with soonest possible. Where an organization lacks proper evaluation mechanisms of its own policies and frequent revision of its practices, the organization risks being defrauded by employees who are used to the practices and who might find a way to conceal their fraudulent activities (Hayali et al, 2013). Monitoring of activities provides oversight over the functioning of ICS. The review pinpoints those areas of ICS that are required to be revised. The self-assessment is vital, though an independent assessment from an outsider may give a more objective and independent review report (Kumuthinidevi, 2016)

The study by Etengu and Amony (2016) showed that monitoring significantly affects financial performance. Ayagre, Appiah-Gyamerah and Nartey (2014) studied effectiveness of Internal Control Systems of banks in Ghana and it was found that monitoring activities on ICS were effective in the banks. Kumuthinidevi (2016) further in the study showed that self-assessment or monitoring moderately supported the level of effectiveness of ICS. Amudo and Inanga (2009) further in evaluating monitoring they found that monitoring of projects did not function properly, though it was concluded that this was due to weak control environment. Monitoring has been found to be both effective and ineffective in the reviewed studies. Therefore, it was important to undertake a study to draw a definitive conclusion.

2.3.6 Compliance with Prudential Regulations

Banks are regulated by government through the CBK. The supervisory authority of CBK has been strengthened by amending the Banking Act. The government ensure elaborate

and stringent banking regulations as banks play major role in economy as providers of revenue (Osebe & Chepkemoi, 2016). Commercial banks are regulated under Banking Act and they are closely monitored to ensure that they comply with laws and regulations due to their dominance in financial sector (Githua &Musiega, Juma & Alala, 2013). Banking regulations stabilizes the economy as none regulation can trigger crises (Gathaiya, 2017). Financial regulations have been found to have reduced capability of interventions in banking sector. Kenya as a country has enacted laws and regulations that improve the financial inclusion needs and soundness in financial sector (Kadongo, 2018). Government introduce banking regulations such as security standards so as to protect depositors (David & Muendo, 2018).

The prudential guidelines are divided into micro and macro prudential guidelines. Macro prudential guidelines are meant to safeguard the economic and financial stability Micro prudential guidelines are meant to protect banks' customers from potential bank failure (Momanyi, 2018). Dubai bank was violating the prudential regulations on capital deficiencies and liquidity by breaching cash requirement ratio. This practice was flagged by the CBK and the bank was penalised. The violation persisted and Dubai bank was placed under receivership due to none adherence to prudential regulations (Gathaiya, 2017). Prudential Guidelines aims to address various aspects of banks' operations such as; risk management, corporate governance, consumer protection and loan loss prudential guidelines (Oribu, Atambo & Mogwambo, 2016). Momanyi (2018) stated that the soundness and safety of regulations matters in protection of customers. The study by Gathaiya (2017) concluded that the CBK as a regulator and supervisor of the banks has failed to fulfil its mandate as its supervisory department has not been effective in prevailing on malpractices in banking in specific violations of insider lending. Kodongo (2018) postulated banking regulations (capital adequacy and liquidity) affect provision of credit to small businesses negatively and lead to rationing of capital. Adherence to prudential guidelines from CBK has led to increased profitability in banks as per the conclusion of the study by Oribu, Atambo and Mogwambo (2016).

2.4 Conceptual Framework

The study's main objective was to determine the effect of ICS on fraud prevention. The relationship between independent and dependent variable is shown below:

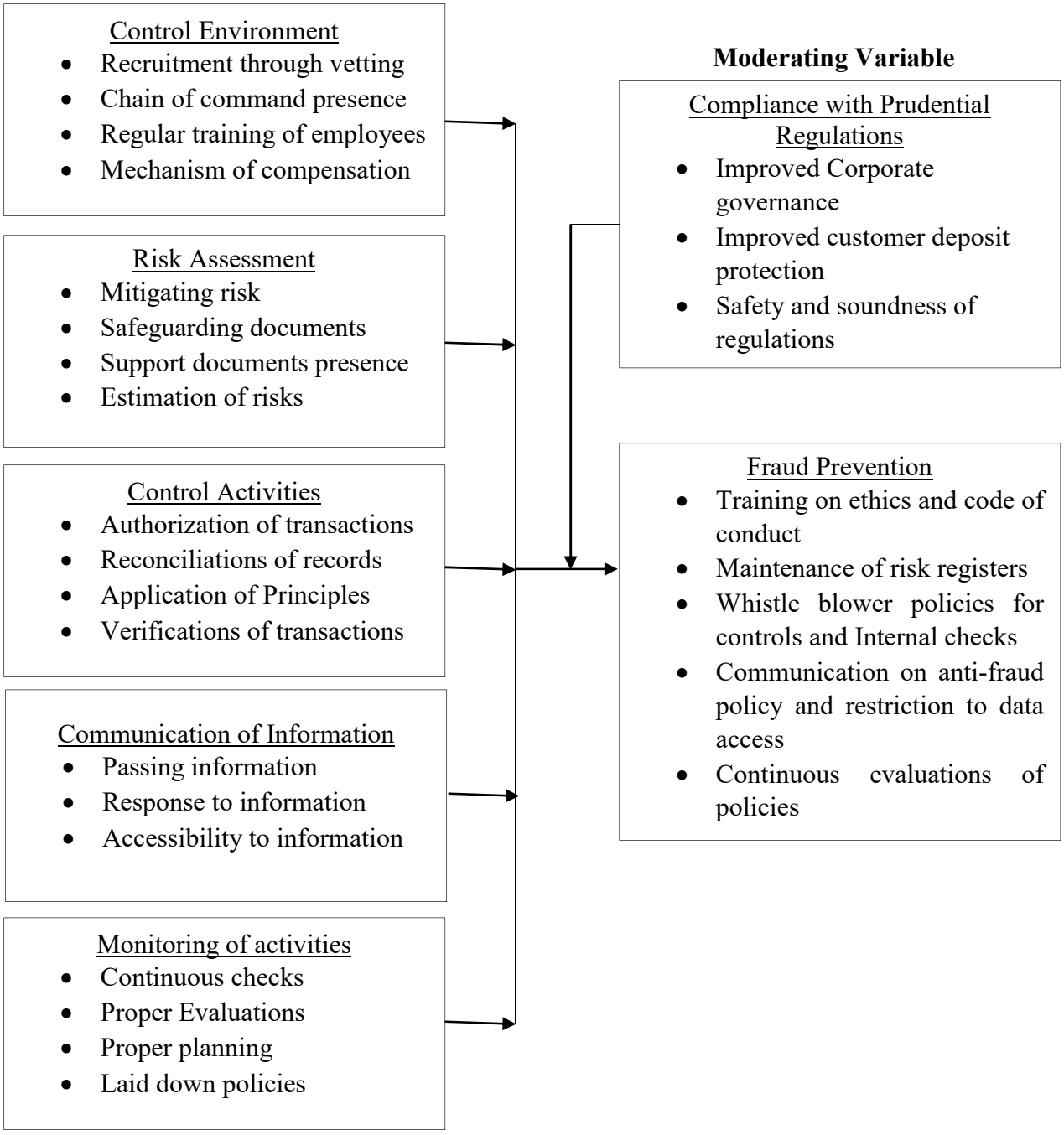

Figure 2.3: Conceptual Framework

2.4.1 Control environment

The control environment establishes quality within organization by influencing the control and consciousness of organization's workers. Ethics in business practices, the adopted management philosophy and business integrity practices play major roles as control environment component. The control environment if properly embedded in the organization can fully thwart efforts of committing fraud.

2.4.2 Risk assessment

Risk assessment is the process to identify, measure and analyze risks which may be within or outside the organization, risks that can be controlled and those that are uncontrollable, at a particular business levels and for the entire financial institutions. Management must examine all risks the financial institutions are exposed to because risk-taking that is uncontrolled can prevent the bank from meeting its goals or can negatively affect its operations.

2.4.3 Control Activities

Control activities refer to actions which when supported by procedures and policies and undertaken carefully and within time can minimize risks. As used in the study control activities may be or not limited to include approvals of transaction, proper authorizations, verifications and reconciliations of transactions, reviews and improvement of performance if need be, security of both fixed and current assets and segregation of duties.

2.4.4 Communication of Information

Fraud within the organization can be averted by capturing and disseminating vital information in state and within stipulated time that will help the stakeholders to undertake their duties. Accounting systems can be used as means of identifying, assembling, analyzing, classifying, recording, and reporting transactions. These systems must be well structured in order to assist in controlling fraud. Information communication systems help the employees to know their duties well within the control system, beside understand how their duties affect those of others and their accountability.

2.4.5 Monitoring

Monitoring should be a continuous process requiring identified weaknesses and deficiencies to be reported promptly and those weaknesses addressed well in advance to avert any act of fraud. Monitoring enables the management to evaluate the ICS and seal all the loopholes that the fraud perpetrators might use to commit fraud.

2.4.6 Compliance with Prudential Regulations

Prudential regulations are financial regulations or legal framework that focuses on financial system or institution stability through, minimum capital requirements, loan portfolio or diversification of banks investment. The micro-prudential regulations focuses on stability of individual institutions whereas, macro-prudential regulations focuses on the entire financial system. The compliance with these regulations is important in stabilizing the real economy and non-compliance attracts penalties from the CBK.

2.4.7 Fraud Prevention

These are measures, mechanism, policies and procedures that are applied by the management of an organization to prevent or protect firms against loss or misuse of organization's assets by fraudsters for their own selfish gains.

2.5 Summary of Reviewed Literature

In this study three theories have been used regarding fraud. Agency theory was applied to show the relationship between the custodian of ICS and the other stakeholders. The fraud lifecycle theory has been used to show chronologically stages that management may follow until the perpetrator is convicted for the crime. Fraud triangle theory has been used to indicate the perceived causes for an individual to commit crime. The theory explains that before the fraudster can commit a crime, he must first have the incentive or motive that pushes him to commit a fraud, this motive may be lack of something, or pressure from the prevailing circumstances. Secondly the theory states an opportunity may arise that may push the perpetrator to commit fraud. Lastly the rationalization is used by the perpetrator to commit fraud. The fraudster may convince himself that he has a good reason to commit fraud, for example he may argue that he works so hard and is

paid less or the cost of being caught will be less than the benefits he will derive from the fraud.

The study also used fraud diamond theory; this theory is a modification of the fraud triangle theory. The three elements of the fraud triangle theory were used and a fourth element called capability was added. This theory states that the prior three elements may be present but the fraud may not occur. Capability to commit fraud is vital for the fraud to be committed. Further the theory explains the elements of capability which include the position one holds, confidence and ego, ability to deal with stress, intelligence and ability to coerce other to commit or conceal fraud.

The empirical literature has shown how different components of ICS that include control environment, risk assessment, control activities, communications of information and monitoring of activities have been used to address various problems that affect organizations. The conceptual framework has demonstrated the relationship between the independent variables and dependent variable. The key variables of the include control environment, risk assessment, control activities, information and communications, monitoring of activities and fraud were explained to provide clear understanding of these variables.

2.6 Research Gaps

The empirical literature reviewed revealed that the study on ICS has been carried out but not comprehensively. Thao (2018) carried out a study on effectiveness of the internal control system in the private joint-stock commercial banks in Thai Nguyen province, Vietnam, this study focused on a single province and the banks were private leaving other parts of the country and public banks. Kumuthinidevi (2016) studied effectiveness of ICS in private banks thus leaving those banks with government shareholdings, Gesare, Nyagol and Odongo (2016) studied influence of ICS on fraud risk management among commercial banks, and this study was based on two components of ICS leaving out three other components. Okonkwo and Linda (2016) focused on the internal control techniques only thus did not address the entire system of internal controls. Entengu and Amony

(2016) focused on ICS and performance of Non-Governmental Organizations thus the study did not focus on banks.

In the study, the relationship of ICS and credit risks in European banks by Akwaa-Sekyi (2016), the focus was on European banks only which created a gap as banks in Kenya were not addressed. Owusu-Boateng, Amofa and Owusu (2017) carried research on ICS in GN bank, this study was based on a single bank. Adetiloye, Olokoyo and Taiwo (2016) focused on fraud prevention and internal control in Nigerian banking system, this study was based on banks in Nigeria. Mwithi and Kamau (2015) studied strategies adopted in combating fraud in commercial banks thus other banks were excluded. Ayagre, Appiah-Gyamerah and Nartey (2014) studied the effectiveness of ICS of banks based on two components of ICS. Amudo and Inanga (2009) studied effectiveness of ICS but their study was based on AfDA in Uganda, thus other banks were not considered.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter describes how the study was undertaken. The main focus was on research philosophy, research design, population of the study, data collection instruments and procedure, operationalization and measurements of variables, pre-testing of research instruments, data processing and analysis techniques.

3.2 Research Philosophy

Research philosophy has been defined "as that system of assumptions and beliefs about knowledge development". These assumptions enable the researcher to understand research questions, method to be used in research and most importantly to interpret the findings of research (Sanders, Lewis & Thornhill, 2009). In selection of appropriate philosophy, it is prudent to understand the available philosophies. The philosophies used in research include positivism that deal with social observable realities, interpretivism that deals with human understanding nature and their different roles in the society and realism that focuses on scientific inquiry which emphasizes on reality as projected on sense of truth (Chetty, 2016). Pragmatism as a philosophy deals with facts and stipulates that research is determined by the problem, whereas realistic philosophy deals with assumptions deemed necessary for subjective human nature (Žukauskas, Vveinhardt, & Andriukaitienė, 2018). Pragmatism starts with the problem with intentions of producing results that can be applied in practice in the future. Pragmatists believe that a problem can be viewed in many different dimensions and there is no particular view that can give full reality (Sanders, Lewis & Thornhill, 2009). Pragmatism paradigm addresses itself towards practical solutions to problems that exist. The study adopted pragmatism research philosophy. Philosophy of pragmatism is involved in provision of practical solutions to problems and assumes that problem cannot be viewed from a single perspective. The study therefore adopted pragmatism philosophy as it deals with social problem (fraud) that requires practical solution and it cannot be viewed from single perspective.

3.3 Research Design

Research design forms the base of any research and therefore it should be prepared with great care as any error may reduce the reliability of data and could upset the whole research. Research design facilitates data collection for investigation purposes. It provides elaborate plan for data collection to establish the relationship of variables in research study (Mwithi & Kamau, 2015). The researcher used descriptive research design and correlation research design. Descriptive research studies are aimed at gaining information on the current status of a phenomenon. It provides accurate information of events, people or circumstances (Rahi, 2017).

Descriptive studies are versatile in most management discipline and that why they are popular. They are more preferred by the policy analysts and administrators for planning, evaluating, and monitoring (Cooper & Schindler, 2014). Correlational research design was used to determine whether the variables are related (Kimani, 2015). Correlational research design is grounded on the relationship between variables. In this design the direction and degree of relationship between variables is of paramount importance. The aim of correlational research design is to predict as well as check the consistency. Correlational studies do not manipulate variables but they establish existence of relationship between variables which is indicated by presence of correlation (Queirós, Faria, & Almeid, 2017). The study's general objective was to establish the effect of ICS on fraud prevention in banking sector in Kenya, therefore a combination of descriptive and correlational research designs was most appropriate.

3.4 Population

The target population means all items that contain the information that is desired for research and it is used to determine whether a sample or the total population will be used in the research study (Cooper & Schindler, 2014). The study utilized census for data collection. The census was applied in case of research units where all the banks registered to operate in Kenya were included in research study. The research study was undertaken in all banks' headquarters or offices of banks registered and operating in Kenya. Kenya has 42 registered banks but the study was conducted on 39 banks. Three banks which include Charter house bank which is under statutory management, Chase bank and

Imperial banks which have collapsed were not included in the study. All branch managers, operations managers and cash managers\supervisors in banks' headquarters were involved in the study. Though the senior most managers in banks among them chief executive officers, chief operations officers among others have their offices in bank headquarters, the bank branch they operate in has branch managers, operations managers and cash managers\supervisors who oversee the operations of that specific bank branch. The aforementioned senior officers oversee the operations of the entire bank including foreign branches. The study was undertaken in banks' headquarters as they are normally the largest branches in each bank. The branch manager, operations managers and cash manager/supervisor in the headquarters are well conversant with the daily operations and strategic direction of the bank, therefore they were deemed to be the most appropriate for this study. Each bank has one branch manager, operations managers and cash manager/supervisor, therefore 117 respondents from all 39 banks were participants in the study.

3.5 Data Collection Instruments

The study used both primary and secondary data. Questionnaire was used as a tool of collecting primary data. In utilising the questionnaire as a tool of data collection it was assumed that the respondents were aware of the importance of the study as well as comprehends the items contained in the questionnaire (Nganga, 2014). The respondents involved in the study were branch managers, operations mangers and cash managers or supervisors. These respondents are experienced and educated thus the questionnaire was very suitable for data collection. The questions were simple and mostly closed so as to enable the respondents to answer them easily.

The questionnaire had eight different sections. The first section was background section that was majorly to collect information about the position of respondent in the bank, length of his service or experience, to find out whether the respondent was aware of the existence of internal controls and whether in his/her opinion the controls were necessary. The other eight sections of the questionnaire were designed based on the variables of the study. The questionnaire restricted the statements to a maximum of eleven per variable to

ensure more people responded to the questions as longer questionnaire with many questions may discourage people to respond. The questionnaires used five-point Likert scale for the respondents to rank their answers and one question in each section that required the respondent to give an opinion on the variable. Nganga (2014) suggested that in analysing Likert scale data an equidistance of 0.8 should be used, the range based on this analysis was; Strongly Disagree (SD) $1 < SD < 1.8$; Disagree (D) $1.8 < D < 2.6$; Indifferent (I) $2.6 < N < 3.4$; Agree (A) $3.4 < A < 4.2$; and Strongly Agree (SA) $4.2 < SA < 5.0$. Therefore, the research adopted this ranking. The Likert scale was used to give the respondents easy time in answering the questions and for easy analysis. The questionnaires were used to collect primary data as they are easy to distribute and took less time.

The study also used secondary to supplement the primary data. The secondary data was used to determine whether there was fraud in banking sector in Kenya. A simple secondary data schedule was used to collect data for computation of ratios to be used in Beneish model to analyse financial statements to determine whether there were cases of earning management. Document analysis (financial statements) was carried out to find whether the organizations manipulated their financial accounts to reflect favourable financial position to hoodwink customers, investors and potential investors. Financial reports, reports from regulatory authority like CBK and investigative bodies were relied upon to establish the extent and seriousness of fraud cases in the banking sector in Kenya. These reports were used to supplement the findings of hypotheses testing and in order to draw a clear conclusion.

3.6 Data Collection Procedure

The researcher applied for research clearance permit from National Commission for Science Technology and Innovation (NACOSTI) which was granted. Based on the permit requirements, the researcher sought permission from the Nairobi county commissioner and county director of education in Nairobi. The two offices granted permission by issuing authorization letter. Lastly the researcher sought firms' managements' permission to carry out research in their firms, this was done through letters of request and follow up

phone calls. Permissions were granted to collect data from respective institutions. The researcher engaged only three assistants in distribution of research questionnaires as the number of banks were few though were distributed far and wide in the city. The assistants were trained on ethics and on the way to respond on some queries arising from questionnaires, they were also advised to call the researcher in case the questions were technical or required the researcher's input. The introduction letter from the university was attached to each questionnaire before these tools were handed over to the respondents. The questionnaires were then distributed by the researcher and assistants to branch manager, operations manager and cash supervisor in the branch and in some cases the branch managers requested to be left with the questionnaires to distribute to operations manager and cash supervisors. The questionnaires were collected after a duration not exceeding one day after administration.

3.7 Operationalization and Measurement of Study Variables

Various indicators were used to operationalize and measure independent, dependent and moderating variables.

3.7.1 Measurement of Independent Variables

The ICS is made up of five components which include; control environment, risk assessment, control activities, communication of information and monitoring. Control environment was measured by evaluating recruitment through vetting, chain of command in organizational structure, follow-up in delegated responsibilities, regular training of employees and whether there are proper mechanisms for compensation (Gamage, Lock & Fernando, 2014). Risk assessment were measured based on various aspects that include ensuring whether proper mechanisms for mitigating risk have been put in place, whether financial documents are properly safeguarded, Identification and estimation risks, and ensuring that supporting documents for every transaction were provided (Gesare, Nyagol & Odongo, 2016). Questionnaire deigned in five-point Likert scale was utilised. Control activities were measured using aspects such as, whether there is authorization and reconciliation of transactions, follow up on tasks assigned and whether proper verification of transactions is done (Akwaa-Sekyi & Rene, 2016). Further aspects include

accounting principles application and whether there is segregation of duties (Gamage, Lock & Fernando, 2014).

Communication of information was evaluated based on means of passing information, roles of employees in communication, system of capturing information (Kumuthinidevi, 2016). Verification of information communicated, how management responds to information received and how easy it was to access required information for action was also included (Akwaa-Sekyi & Rene, 2016). Monitoring was measured by looking into evaluation of mechanism, follow laid down rules, planning of activities, engagement of an independent person to evaluate the controls and continuous checks on controls to ensure proper operations (Okonkwo & Linda, 2016). Questionnaire deigned in five-point Likert scale was utilised.

3.7.2 Measurement of Dependent Variable

Fraud prevention was evaluated based on reported cases of fraud, presence and frequencies of various types of fraud. These frauds include; cash transfer fraud, computer frauds, fraudulent expenses claim, manipulation and falsification of financial statements (Abiola & Oyewole, 2013). Fraud prevention was measured by focusing on some of techniques that can be applied in fraud prevention which include; communicating the anti-fraud policies, training on ethics, maintenance of code of conduct, pinpointing red flags, whistle blower policy, maintenance of risk registers, continuous evaluations and strengthening of the policies, internal checks, reporting modalities and proper restrictions to data access. Questionnaire deigned in five-point Likert scale was utilised.

3.7.3 Measurement of Moderating Variable

Prudential guidelines offer regulatory framework for improving the safety of deposit taking institutions. The study sought to evaluate level of adherence to the regulations and mechanisms applied for safeguarding the customers' deposits, improving corporate governance, improving risk management as well as losses from loans (Oribu, Atambo & Mogwambo, 2016). The banking laws in general are meant to improve the controls within the banks by providing preventive and punitive mechanisms against violators of

the laws and fraudsters. Therefore, compliance with prudential regulations was used in the study to determine how effective banking regulations are in enhancing the strength of ICS in banks.

3.8 Pre-Testing of Research Instruments

Pretesting of research instruments enables the identification and potentially reduction of measurement error that damages statistical estimates of the population used in research study. Reliability can be established by collecting data from 10% to 20% of the respondents not involved in the study (Hazzi & Maldaon, 2015). Pre-testing of the questionnaire was undertaken before actual research where a set of 20 questionnaires were distributed to different personnel of six micro finance institutions. The six microfinance institutions translated to around 14.3% of the target population of 42 banks. There are 14 registered microfinance institutions as per CBK directory, therefore six microfinance institutions were deemed sufficient for piloting purposes. The institutions were selected as they are involved in similar operations as banks. The pretesting was meant to pinpoint whether the research questions forwarded would be answered correctly by the respondents. The study collected the answered questionnaires and undertook a post-test to evaluate the responses and rectified the questionnaire where need arose.

3.8.1 Instrument Reliability Results

Reliability or stability is said to exist where the same results are obtained from repeated tests based on the same group of respondents. The reliability of research instrument was undertaken using reliability values (Alpha values) advanced by Cronbach. Tavakol and Dennick (2011) who indicated that the values of Cronbach's alpha accepted to measure reliability is between 0.7 and 0.9. The Cronbach alpha for variables tested ranged between 0.785 and 0.913, thus they were within the accepted level as per Cronbach. Tavakol and Dennick (2011).

3.8.2 Instrument Validity

Validity of instrument is difficult to determine, but validity is tested by the data collected using the instrument. Validity of instruments refers to number of systematic or built-in

errors that can be found in the research instrument and can be established by the help of the experts (Bolarinwa, 2015). Oresi (2013) stated that reliability determines the validity of research instrument in that the questionnaire that is not reliable cannot be valid. The data collection instrument validity was verified through the help of study supervisors who are experts in the area. They reviewed the questionnaire and suggest changes which were incorporated. The study utilized average variance extracted (AVE) to test convergent and discriminant validities of the data collection instrument as suggested by Kimani (2015).

3.9 Data Processing and Analysis

After collecting the data, it was classified, edited, coded and latter tabulated for easy analysis. Descriptive and inferential statistics were used for data analysis. The data was coded and entered into the computer for analysis. First descriptive statistics were generated for quantitative data. Document analysis was applied to analyse qualitative data with the help of computer that generated descriptive statistics after the coding of qualitative data. Descriptive statistics included mean and standard deviation. Karl Pearson's coefficient of correlation was used to show the direction and strength of the relationship between the dependent and independent variables. Factor analysis was undertaken to reduce the number of variables. First exploratory factor analysis was undertaken to reduce the variables by eliminating those variables with less factor loading. The confirmatory factor analysis was also utilized to check covariance, construct biases and construct validity.

The structural equation modelling (SEM) and moderated multiple regression models were used to determine the strength of the relationship between the ICS and fraud prevention and also the moderating effect of compliance with prudential regulations on the relationship between the dependent and independent variables. The strength of the relationship between dependent and independent variables was based on the scale suggested by Gan & Ahmad (2011). Gan and Ahmad (2011) suggested the strength of the relationship between variables can be interpreted from either direction, the strength of relationships ranges between 0.91 to 1.00 for very strong, 0.71 to 0.90 for strong relationship, 0.51 to 0.70 for

medium relationship, 0.31 to 0.50 for weak relationship, 0.01 to 0.30 for very weak relationship and 0.00 for no correlation.

Analysis of Variance (ANOVA) test was used to test the overall significance of the model. Shapiro-Wilk test was used to test for normality, the data is said to be normally distributed if the p-value is greater than 0.05 (Nganga, 2014). Multicollinearity was tested to determine whether there is inter-correlation among independent variables, the variance inflation factor (VIF) was used. There are no definitive criteria of determining multicollinearity using VIF, however any value of VIF that exceeds 10 indicates high level of multicollinearity (Khalaf & Iguernane, 2016). To test autocorrelation among variables, Durbin Watson test was applied to test autocorrelation and independence of residuals. Durbin Watson test ranges between 0 and 4, value of less than one and a value of more than three are cause of concern (Field, 2016). Breusch-Pagan test was applied for heteroscedasticity, the criteria to determine the presence of heteroscedasticity is the probability value which should be more than 0.05 in order not to reject the hypothesis that there is no heteroscedasticity (Ali, Ormal & Ahmad, 2018) and t-statistics was applied in the tests of hypothesis.

Regression equation is statistical process of measuring relationship between variables (Kinyua, 2016). The overall model fit for regression models was undertaken using chi-square, CMIN/DF, comparative fix index (CFI), root mean square for error approximation (RMSEA), pclose and standardized root mean residual (SRMR) as suggested by Shopati, Mitonga and Aipinge (2018).

Secondary data was used to ascertain the existence of fraudulent activities in banks through the financial statements. This was done to supplement and strengthen the primary data. In secondary data analysis five ratios were computed from financial statements of various banking institutions these ratios were Days' Sales in Receivable Index (DSRI), Gross Margin Index (GMI), Asset Quality Index (AQI), Sales growth Index (SGI) and Depreciation Index (DEPI). The ratios were computed to ascertain whether the organizations were practicing earning management or manipulating the financial statements. Beneish five-variable m-score was used to test manipulation of financial

statements. Probit regression model was later applied based on the information derived from the Beneish model to revise the m-score and establish likely fraudulent and likely non-fraudulent banks. Probit model applied in the studies with categorical dependent variable. Probit regression model is a statistical probability model that has dependent variable categorised into binary form of 0 and 1 (Uzuno & Akcay, 2012). The probit model constrains the estimated probabilities to binary form while at the same time relaxes the constraint effect of explainer variable is constant all across different values of explained variable (Sebopetji & Belete, 2009) Probit regression model was applied to determine the banks that were engaged in fraudulent activities or otherwise through financial statement manipulations. Manipulation of financial statements indicates weak ICS over preparations of financial statements. In this study the banks were categorised as either manipulator (1) or non-manipulator (0) based on Beneish m-score before the application of Probit regression model.

Regression equation models 3.1 and 3.2 were used for primary data analysis;

OLS equation $\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon i}$ **…..Equation 3.1**

MMR equation $\mathbf{Y = \beta_0 + \beta_1 X_1 Z + \beta_2 X_2 Z + \beta_3 X_3 Z + \beta_4 X_4 Z + \beta_5 X_5 Z + \varepsilon i}$ **Equation 3.2**

Where: Y is Fraud Prevention

X_1 is Control Environment

X_2 is Risk Assessment

X_3 is Control Activities

X_4 is Communication of information

X_5 is Monitoring Controls

β_0 is constant or intercept;

β_1 - β_5 are corresponding coefficients for the respective independent variables

Z is the moderating variable

ε is Error term

OLS is Ordinary Least Square

MMR is Moderated Multiple Regression.

Beneish Five Variable M-score

Beneish model is applied to detect financial statement manipulations and fraud financial statement. Beneish five-variable model was applied due to the significance of the five ratios in determining the financial statement manipulators as suggested by Feruleva and Shtefan (2017). The model was represented in equation 3.3

$$\mathbf{M = \beta_0 + \beta_1\ DRSI + \beta_2\ GMI + \beta_3\ AQI + \beta_4\ SGI + \beta_5\ DEPI \ldots\ldots\ldots\ldots\ Equation\ 3.3}$$

M is Beneish M-score

DRSI represents Days' Sales in Receivable Index.

GMI represents Gross Margin Index.

AQI represents Asset Quality Index

SGI represents Sales growth Index.

DEPI represents Depreciation Index.

β_0 represents constant or intercept.

$\beta_1 - \beta_5$ are corresponding coefficients for the respective

The Probit regression model applied in the study was:

$$pr(Y = 1|X) = \phi(X^{n}\beta)$$

Where 1 represents Manipulator

Table 3.1: Models for Testing Hypotheses

Objective	Hypothesis	Model	Type of Analysis
To determine the effect of control environment in fraud prevention in banking sector in Kenya	Control environment does not have significant effect in fraud prevention in banking sector in Kenya	$\mathbf{Y = \beta_0 + \beta_1 X_1 + \mathcal{E}i}$ Y is Fraud Prevention; X_1 is Control Environment; ε is Error term	SEM Regression Analysis
To examine the effect of risk assessment in prevention of fraud in banking sector in Kenya	Risk assessment does not have significant effect in fraud prevention in banking sector in Kenya	$\mathbf{Y = \beta_0 + \beta_2 X_2 + \mathcal{E}i}$ Y is Fraud Prevention; X_2 is risk assessment; ε is Error term	SEM Regression Analysis
To establish the effect of control activities in fraud prevention in banking sector	Control activities do not have significant effect in fraud prevention in banking sector in Kenya	$\mathbf{Y = \beta_0 + \beta_3 X_3 + \mathcal{E}i}$ Y is Fraud Prevention; X_3 is control activities; ε is Error term	SEM Regression Analysis
To determine the effect of communication of information in prevention of fraud in banking sector in Kenya	Communication of information do not have significant effect in fraud prevention in banking sector in Kenya	$\mathbf{Y = \beta_0 + \beta_4 X_4 + \mathcal{E}i}$ Y is Fraud Prevention; X_4 is communication of information; ε is Error term	SEM Regression Analysis
To establish the effect of monitoring of activities in fraud prevention in banking sector in Kenya	Monitoring of activities does not have significant effect fraud prevention in banking sector in Kenya	$\mathbf{Y = \beta_0 + \beta_5 X_5 + \mathcal{E}i}$ Y is Fraud Prevention; X_5 is monitoring of activities; ε is Error term	SEM Regression Analysis
To establish the moderating effect of compliance with prudential regulations on the relationship between the ICS and fraud prevention in banking sector in Kenya	Compliance with prudential regulations has no moderating effect on the relationship between ICS and fraud prevention in banking sector in Kenya	$\mathbf{Y = \beta_0 + \beta_1 X_1Z + \beta_2 X_2Z + \beta_3 X_3Z + \beta_4 X_4Z + \beta_5 X_5Z + \mathcal{E}i}$ Y is Fraud Prevention; X_1 is Control Environment; X_2 is Risk Assessment; X_3 is Control Activities; X_4 is Communication of information; X_5 is Monitoring Controls; β_0 is constant or coefficient of intercept; β_1 - β_5 are corresponding coefficients for the respective independent variables; Z is Corresponding coefficients for the moderating variable; ε is Error term	SEM Regression Analysis.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter details the findings, interpretations and discussion of results from the data analysed. The study intended to find the relationship between the ICS and fraud prevention in banking sector in Kenya. The components of ICS that include; control environment, risk assessment, control activities, communication of information and monitoring were used as the independent variables. Fraud prevention was the dependent variable whereas compliance with prudential regulations was used as the moderating variable. Research instrument pre-test results, descriptive statistics, regression and moderated regression models were used in data analysis.

4.2 Response rate

The target population of the research study was 39 banks registered or operating in Kenya. The study sought information from 117 respondents from the 39 banks who included branch managers, operations managers and cash managers or supervisors. Eighty three questionnaires were received duly filled from 33 banks only translating to 84.6% response rate. Nulty (2008) indicated that the adequacy of response rate for the study depends on the use of data, however a response of 60% or more is desirable. The respondents from the 33 banks filled and returned 83 questionnaires.

4.3 Background Information

The background information was sought from the respondent based on the items in the research instruments. The information sought for analysis included the position held in the organization, the period of service, presence and relevance of internal controls in the organization as per the respondent's opinion.

4.3.1 Position Held in the Bank

The respondents were required to indicate their position in the bank. The respondents from 33 banks who returned the questionnaires held different position as displayed in table 4.1

Table 4.1 Position held by Respondents in Banks

Position	Number of Respondents	Percentage
Branch Managers	19	23%
Operations managers	33	40%
Cash Supervisors or Managers	31	37%
Totals	**83**	**100%**

The positions held by respondents as displayed in table 4.1 indicates that the branch managers constituted 23%, the operations mangers were the majority at 40% whereas the cash supervisors or managers represented 37% of the respondents. The branch managers are few as quite a number referred the questionnaires to operations managers. The cash supervisors or managers were less than operations managers as some banks do not have this position and the operations managers took the responsibilities that could have been handled by cash supervisors or managers.

4.3.2 Job Experience

The respondents from the targeted institutions were required to state their job experience. The experience was categorized into five different groups. The respondents from 33 banks provided information of their experiences in their jobs. The findings are represented in table 4.2

Table 4.2 Job Experience

Respondent	Below 5 years	5-10 years	10-15 years	15-20 years	Above 20 years
Branch Managers	0 (0%)	0 (0%)	3 (14%)	5 (45%)	11 (52%)
Operations Managers	0 (0%)	16 (59%)	10 (45%)	0 (0%)	7 (33%)
Cash supervisors or managers	2 (100%)	11 (41%)	9 (41%)	6 (55%)	3 (15%)
Totals	**2 (100%)**	**27 (100%)**	**22 (100%)**	**11 (100%)**	**21 (100%)**

The research findings as displayed in table 4.2 shows that there are no branch managers or operations managers who have job experience of below 5 years however there were only 2 cash supervisors or managers representing 100% of officers with experience under five years. In the category of job experience of between 5 and 10 years, there were no branch managers. Operations manager were 16 constituting 59% of the respondents under this category whereas the cash supervisors or managers were 11 constituting 41%. Each category of respondents is represented in job experience of between 10 and 15 years. The branch managers were 3 constituting 14%, operations managers were 10 constituting 45% and the cash supervisors or managers were 9 representing 41%. There were only 11 respondents with job experience between 15 and 20 years where the branch managers were 5 representing 45% and the cash supervisors or managers were 6 consisting 55% on the respondents under aforementioned category.

Job experience of respondents above 20 years included 11 branch managers consisting of 52%, 7 operations managers representing 33% and 3 cash supervisors or managers representing 15% of the respondents with job experience above 20 years. The analysis has shown that the top management of banks has been entrusted to the people with long work experience. As shown in table 4.2 there are only 2 respondents who had job experience with less than 5 years of experience and who were entrusted in cash supervisory which is a single section of bank operations. The operations mangers were spread around all job experience categories beyond five years and all branch managers have job experience of above 10 years. This implies that experience in banks is vital in promotions and being entrusted with more responsibilities. Job experience of the respondent is vital as those respondents who have been in the organization for a long period of time understands well the systems and controls that have been put in the organization. Their knowledge of the systems and controls was important in this the study.

4.3.3 Establishment of Internal Controls

In the study the respondents were asked whether the institution has established the internal controls. The research findings showed that all the 33 banks have established

internal controls. These findings show that the respondents were knowledgeable about the existence of internal controls in their firms. Existence of the internal controls was necessary because the research was based on the ICS. If any of the institution involved in the study did not have internal controls, it could have been omitted from the study as the information sought was only on the use of ICS to prevent fraud.

4.3.4 Necessity of Internal Controls

The respondents were required to indicate whether the internal controls established by their organization were necessary. Respondents from all 33 banks indicated that internal controls established by their institutions are very necessary. These findings show that the respondents appreciate the importance of internal controls in banks. The study sought this information about the necessity of internal controls to establish the attitude of the respondents towards the internal controls. This means that the respondents had positive attitude towards the internal control and the information they provided assisted in addressing the areas of concern if any to improve the ICS.

4.4 Research Instrument Pre-test Results.

The researcher carried out reliability tests on the questionnaires using Cronbach Alpha. The results from the test undertaken are shown in table 4.3

Table 4.3: Cronbach Reliability Coefficients.

Variable	Cronbach Alpha
Control Environment	0.785
Risk Assessment	0.856
Control Activities	0.884
Communication of Information	0.879
Monitoring of Activities	0.836
Compliance with Prudential Regulations	0.913
Fraud Prevention	0.786
Composite Alpha	**0.848**

The Cronbach alpha ranges between 0.785 and 0.913. The average Cronbach alpha is 0.848 which is within acceptable value of Cronbach's alpha of measuring reliability which is between 0.7 and 0.9 as recommended by Tavakol and Dennick (2011).

4.5 Descriptive Data Analysis of Internal Control System and Fraud Prevention

This section of the study shows descriptive statistics of the various variables of the study. The study used fraud prevention as the dependent variable, control environment, risk assessment, control activities, communication of information and monitoring as independent variables. Compliance with prudential regulations was used as moderating variable. The descriptive statistics that are suitable for interval scales data like the Likert scale are mean and standard deviation for variability (Boone & Boone, 2012). Nganga (2014) suggested that in analysing Likert scale data, an equidistance of 0.8 should be used, the range based on this analysis applied was; Strongly Disagree (SD) $1 < SD < 1.8$; Disagree (D) $1.8 < D < 2.6$; Indifferent (I) $2.6 < N < 3.4$; Agree (A) $3.4 < A < 4.2$; and Strongly Agree (SA) $4.2 < SA < 5.0$.

4.5.1 Descriptive *S*tatistics Analysis on Control Environment and Fraud Prevention

The study objective that was first tested was to examine the effect of control environment on fraud prevention in banking sector in Kenya. In this section the effect of control environment was analysed and the discussion based on study findings was presented. Various aspects of control environment based on factor analysis were assessed and they included; vetting of employees, chain of command, follow-up on delegated responsibilities, training, promotion and compensation, meeting deadlines, assignment of responsibilities, job description, investigations and punishment of wrongdoers and procedures and policies available in the organization. The descriptive statistics of various aspects of control environment are shown in table 4.4

4.4 Means and Standard Deviations for Control Environment

	N	Mean	Std. Deviation
Recruitment of Employees	33	4.1266	.79160
Chain of command in the organization	33	4.4293	.53364
Follow-up on delegated responsibilities	33	4.5808	.37988
Training and induction of New employees	33	4.1417	.87746
Mechanisms of promoting and compensating employees	33	4.0303	.95784
Meeting of deadlines	33	4.5404	.43706
Proper assignment of authority and responsibilities	33	4.1367	.90042
Job descriptions are properly spelt out	33	4.6263	.38422
Mechanisms of investigating and punishing wrong doers	33	4.3788	.45505
Elaborate procedures and policies	33	4.5101	.65476
Valid N (listwise)	33		
Composite Mean and Standard deviation		**4.3591**	**0.63719**

Research findings shown in table 4.4 indicate a composite mean of 4.3591 and a standard deviation of 0.63719. The composite mean computed and small standard deviation obtained implies that respondents strongly agree that the parameters used to measure control environment are effective in fraud prevention and their responses did not differ widely as per standard deviation. On specific parameters the respondents agreed that organizations recruited their employees though vetting (mean=4.1266, standard deviation=.79160), the respondents strongly agreed that the organizations' structure reflected the chain of command that made it easy to report any suspicion (mean=4.4293, standard deviation=.53364). Further results show that there was strong agreement that there is proper follow-up on delegated responsibilities to reduce misappropriation of assets (mean=4.5808, standard deviation=.37988) and that there are regular training and induction of new employees to minimize errors (mean=4.1417,

standard deviation=.87746). There was agreement among respondents that there are proper mechanisms for promoting and compensating deserving employees (mean=4.0303, standard deviation=.95784). Respondents strongly agreed that employees meet set deadlines (mean=4.5404, standard deviation=.43706). Further responses show respondents agreed that assignment of responsibilities and authority is based on qualifications and competences (mean=4.1367, standard deviation=.90042). It was further shown that the respondents strongly agreed that job description are clearly spelt out and employees adhere to the descriptions (mean=4.6263, standard deviation=.38422), organizations have proper mechanisms of investigating and punishing wrongdoers in just and fair manner (mean=4.3788, standard deviation=.45505) and that organizations have elaborate procedures and policies available to employees (mean=4.5101, standard deviation=.65476).

The composite mean computed indicated respondents strongly agree that the parameters used to measure control environment in fraud prevention were effective. The small standard deviation of less than one for all parameters implied that the responses by the respondents did not differ widely. These results were similar to the study undertaken by Iorsue, Terzungwe and Onipe (2018) which concluded that the control environment was very effective in ensuring that the ICS was able to prevent materials fraud in banks in Nigeria. Control environment as a component of ICS was found to be effective in banking industry in Ghana (Ayagre, Appiah-Gyamerah & Nartey, 2014). This strong rating could be attributed to the fact that the respondents who included branch managers, operations mangers and cash managers or supervisors who bear huge responsibility to ensure that organization's directives and ethics are maintained in their branches, could have provided higher scores not to be seen as incompetent in their areas of operations.

4.5.2 Descriptive Statistics Analysis on Risk Assessment and Fraud Prevention

The next objective of the research was to assess the effect of risk assessment on prevention of fraud in banking sector in Kenya. Under this section the study focused on; mechanisms of risk mitigation, proper security for financial documents, mechanisms of identifying potential risks, mechanisms for estimating potential risks, reports for missing

supporting documents, response to potential risks, policies for monitoring operations and transactions, financial reporting controls, periodic reconciliations for transactions and review of procedures and policies. The results of descriptive statistics are shown in table 4.5

4.5 Means and Standard Deviations for Risk Assessment

	N	Mean	Std. Deviation
Mechanisms for Mitigation of risks	33	4.6869	.33788
Proper security for financial documents	33	4.6061	.40998
Mechanisms of identifying potential risks	33	4.5354	.48189
Mechanisms for estimating potential risks	33	4.1869	.85163
Reports for missing supporting documents	33	4.6263	.52545
Response to potential risks	33	4.4848	.58684
Policies for monitoring operations and transactions	33	4.4848	.58239
Financial reporting controls	33	4.7475	.39774
Periodic reconciliations for transactions	33	4.4646	.57548
Review of procedures and policies	33	4.4343	.58473
Valid N (listwise)	33		
Composite Mean and Standard deviation		**4.5258**	**0.53340**

Descriptive statistics results in table 4.5 shows that the respondents strongly agree with risk assessments provided in mitigation prevention of fraud in banking sector (composite mean=4.5258, standard deviation=.53340). The composite mean computed and small standard deviation obtained implies that respondents strongly agree that the parameters used to measure risk assessment are effective in fraud prevention. The standard deviation was small which implied that the responses did not differ much. Specific findings indicate that the respondents strongly agree that organizations have proper mechanisms for critical operating risk mitigation (mean=4.6869, standard deviation=.33788). The respondents strongly agree that proper security mechanisms for financial documents have been established (mean=4.6061, standard deviation=.40998) and that mechanisms of identifying potential risks are in place (mean=4.5354, standard deviation=.48189).

Further results show that the respondents strongly agree that mechanisms for estimating potential risks were in place(mean=4.1869, standard deviation=.85163), there were no reports for missing supporting documents in order to authenticate transaction (mean=4.6263, standard deviation=.52545), the organizations respond to potential risks appropriately (mean=4.4848, standard deviation=.58684) and that organizations have proper policies for monitoring operations and transactions (mean=4.4848, standard deviation=.58239). Respondents strongly agree that organizations have provided strict financial reporting controls to prevent misstatements and errors in financial statements (mean=4.7475, standard deviation=.39774). Study results have shown that the respondents strongly agree that there were periodic reconciliations to ensure that the physical assets tally with the records (mean=4.4646, standard deviation=.57548) and the organizations review their procedures and policies to cope with sophistication of new technology that would increase risk (mean=4.4343, standard deviation=.58473).

The composite mean (mean =4.52580) computed implied that respondents strongly agree that the parameters used to measure risk assessment were effective in fraud prevention. The small standard deviation all parameters implied that the responses by the respondents did not differ widely. These results are similar to the findings by Mwichigi and Atheru (2019) which indicated that the banks listed at Nairobi Securities Exchange (NSE) have very strong internal mechanisms for assessing credit risks on the borrower before they give out credit. This high rating of the risk assessment parameters could be due to proper and strong mechanisms that have been put in place for identification of potential risk, analysis, estimation and mitigation of risks. This could also be attributed to the fact that the respondents, who bear the burden to safeguard the shareholders' resources at branch level, would like to assure customers, potential and current investors that their savings and investment are protected against risk in order increase their confidence and attract more customers and investors.

4.5.3 Descriptive Statistics Analysis on Control Activities and Fraud Prevention

The aspects of control activities that were analysed included; regular reconciliation of transactions, application of proper accounting principles, elaborate segregation of duties,

proper verification of supporting documents, regular review of control policies, restriction of access to documents and assets and comparison between budgeted and actual expenditure. Descriptive analysis results are contained in table 4.6

4.6 Means and Standard Deviations for Control Activities

	N	Mean	Std. Deviation
Proper authorization of transactions	33	4.7222	.39455
Regular reconciliation of transactions	33	4.5303	.44964
Application of proper accounting principles	33	4.5303	.49731
Elaborate segregation of duties	33	4.2172	.89703
Proper job rotation practice	33	4.5000	.44876
Proper verification of supporting documents	33	4.6465	.48548
Regular review of control policies	33	3.4848	1.65693
Restriction of access to documents and assets	33	4.6263	.49657
Regular review of employees' performance	33	4.4444	.53953
Comparison between budgeted and actual expenditure	33	4.6414	.44706
Valid N (listwise)	33		
Composite Mean and Standard deviation		**4.4343**	**0.63129**

Table 4.6 shows the descriptive statistics for parameters used for control activities. The computed composite mean of 4.4343 and standard deviation of 0.63129 implied that generally the respondents agreed that the laid down mechanisms under control activities in prevention of fraud are effective and their responses were close. The results shows that the respondents strongly agree that transactions were properly authorized by competent personnel (mean=4.7222, standard deviation=.39455), regular reconciliation of transactions and explanations given in case of discrepancies (mean=4.5303, standard deviation=.44964) and that organizations apply proper accounting principles and employees adhere to the laid down rules and regulations (mean=4.5303, standard deviation=.49731).

Further the respondents agree that there were elaborate segregation of duties to avoid confusion (mean=4.2172, standard deviation=.89703), the findings show that respondents

strongly agree that, there were proper job rotation practices and the employees took their leave on time (mean=4.5000, standard deviation=.44876) and that proper verification of supporting documents was done before completion of transactions (mean=4.6465, standard deviation=.48548). The respondents agree that organizations carry out regular review of control policies to ensure relevance and effectiveness, however the responses differed greatly as indicated by big standard deviation (mean=3.4848, standard deviation=1.65693). The results above shows that the respondents strongly agree that there were restrictions to access to documents and assets (mean=4.6365, standard deviation=.49657), employees performances were regularly reviewed and any noticeable discrepancies addressed appropriately (mean=4.4444, standard deviation=.053953) and comparisons between budgeted and actual expenditure were made and any difference is explained through support document (mean=4.6414, standard deviation=.44706).

The descriptive statistics results show a composite mean of 4.4343, these shows that the respondents strongly agree that the control activities established by the banks were effective in fraud prevention and a standard deviation of 0.63129, showed that the responses did not differ marginally. Mwichigi and Atheru (2019) in their study found the respondents strongly agreed that the various aspects of control activities were effective in credit risk management, these findings collaborate the findings of this study. This strong agreement may due to proper strong controls that have been established. The ratings could also be due to the responsibilities bestowed upon the respondents, since the respondents bear the burden of safeguarding the assets, they may have introduced proper and strong control mechanisms to protect the resources of their organizations.

4.5.4 Descriptive Statistics Analysis on Communication of Information and Fraud Prevention

Another study objective was to determine the effect of communication of information on prevention of fraud in banking sector in Kenya. The study evaluated various aspects based on the results of factor analysis. These aspects included; roles of employees in averting fraud, system of capturing and communication of information, actions taken on information communicated, restrictions to access information, evaluation of information,

proper classification of information, proper policies and procedures and explanation of employees' role in communication. The descriptive statistics on communication of information parameters are given in table 4.7.

4.7 Means and Standard Deviations for Communication of Information

	N	Mean	Std. Deviation
Easier, quicker and safe means of passing information	33	4.5707	.50179
Roles of employees in averting fraud	33	4.7273	.32494
Systems of capturing and communication of information	33	4.5505	.45163
Actions taken on information communicated	33	4.5404	.53850
Verification of financial statements	33	4.6010	.46945
Restriction to accessibility of information	33	4.4444	.64235
Evaluation of information	33	4.4747	.54506
Proper classification of information	33	4.4495	.49210
Proper policies and procedures	33	4.3485	.61430
Explanation of employees' role in communication	33	4.5354	.51834
Valid N (listwise)	33		
Composite Mean and Standard Deviation		**4.5242**	**0.50985**

Descriptive statistics results shown in table 4.7 show a composite mean of 4.5242 and a standard deviation of 0.50985. The composite mean computed and small standard deviation obtained implies that respondents strongly agree that the parameters used to measure communication of information are effective in fraud prevention. The responses were not deviant as per the small composite standard deviation. The specific findings of parameters indicates that the respondents strongly agree that there were easier, quicker and safe means of passing information concerning suspicious or fraudulent activities (mean=4.5663, standard deviation=.60873), that employees were informed of their roles in averting fraud (mean=4.7108, standard deviation=.45613) and that organizations had proper systems of capturing and communicating financial transactions and producing financial statements (mean=4.5301, standard deviation=.59135). Results show that the respondents also strongly agree that actions were taken on information communicated to avert fraud (mean=4.5060, standard deviation=.72201), organizations involved external parties for verification of financial statements (mean=4.5904, standard deviation=.66325)

and that there was restriction to accessibility of information system to authorized personnel only (mean=4.3976, standard deviation=.76413).

Further analysis shows that there is strong agreement that information was evaluated for appropriateness, accuracy, relevance and timeliness before processing (mean=4.4578, standard deviation=.64960), there was proper classification of assets and liabilities in financial statements to avoid fraudulent entries (mean=4.4699, standard deviation=.61162), organizations have put in place proper policies and procedures to receive information from external sources pertaining to potential risks or frauds (mean=4.3373, standard deviation=.78518) and that organizations offer explanation to employees' role and importance in communication to avoid risk or fraud (mean=4.5181, standard deviation=.70471).

Descriptive statistics results indicated a composite mean of 4.5242 which indicated that the respondents strongly agree that the parameters used to measure communication of information are effective in fraud prevention and the standard deviation implied that the responses were almost similar. The study findings were similar to the study undertaken by Sharma and Senan (2019) in their study found that some selected banks in Saudi Arabia had strong accounting, information and communication systems. This rating can be attributed to the belief that the mechanisms that have been put in place were strong as per respondents views. The respondents may have put in place the latest technology to facilitate faster information transfer, safe means of communication and easier way of passing the information.

4.5.5 Descriptive Statistics Analysis on Monitoring of Activities and Fraud Prevention

The study analysed effect of monitoring of activities on fraud prevention in baking sector in Kenya. The following aspects were assessed based on the results of factor analysis; mechanisms for evaluation of activities, regular review of the processes, ensuring the employees follow laid down rules, planning of activities to provide evidence, independent review of effectiveness of controls, continuous checks of controls, continuous evaluations of transactions by the supervisors, investigation and rectifications

of complaints, following of laid down laws by regulatory authority and managements' corrective measures. The results of descriptive statistics analysis of these aspects is presented in table 4.8

4.8 Means and Standard Deviations for Monitoring of controls

	N	Mean	Std. Deviation
Mechanisms for evaluation of activities	33	4.5202	.49081
Regular review of the processes	33	4.4596	.62919
Ensuring the employees follow laid down rules	33	4.4293	.54011
Planning of activities to provide evidence	33	4.5556	.50289
Independent review of effectiveness of controls	33	4.6364	.38291
Continuous checks of controls	33	4.3586	.64700
Continuous evaluations of transactions by the supervisors	33	4.2576	.61250
Investigation and rectifications of complaints	33	4.4293	.47877
Following of laid down laws by regulatory authority	33	4.5657	.46387
Management take corrective measures	33	4.5101	.45058
Valid N (listwise)	33		
Composite Mean and Standard Deviation		**4.4722**	**0.51986**

The results on table 4.8 show a composite mean of 4.4722 and a standard deviation of 0.51986. The results implies that the respondents were in agreement that the parameters used in monitoring of controls are effective in fraud prevention as indicated by mean and small standard deviation implied that the responses were almost similar. The study finding shows that the respondents strongly agree that; mechanisms for evaluation of activities were provided (mean=4.5181, standard deviation=.59184), regular review of the processes was undertaken (mean=4.4819, standard deviation=.72181), employees followed laid down rules (mean=4.4458, standard deviation=.64869), planning of activities to provide evidence was done (mean=4.5542, standard deviation=.66723). Further the study shows that the respondents also strongly agree that independent review of effectiveness of controls was undertaken (mean=4.6506, standard deviation=.47968), continuous checks of controls were done (mean=4.4096, standard deviation=.64461), continuous evaluations of transactions by the supervisors were implemented

(mean=4.2651, standard deviation=.78218), investigation and rectifications of complaints were carried out (mean=4.4578, standard deviation=.56958), laid down laws by regulatory authority were followed (mean=4.5783, standard deviation=.60728) and management took corrective measures (mean=4.5422, standard deviation=.54775).

The computed composite average of 4.4722 indicated strong agreement in monitoring mechanisms. The findings are similar to the findings of the study undertaken by Sharma and Senan (2019) which found that Al rajhi bank had excellent monitoring or self-assessment mechanisms as compared to other banks. Ayagre, Appiah-Gyamerah and Nartey (2014) in their study on monitoring in Ghanaian banking industry found that monitoring is very effective as a component of ICS. The research findings agree with the findings of the study by Nartey (2014). The results of the study could be attributed to strict inter peer audit practices that are prevalent in most financial institutions. The banks ensure that employees audit the work of other employees to establish whether there are some discrepancies in their recordings or cash collected. This ensures that the fraud activities are minimized.

4.6 Inferential Analysis of Internal Control System and Fraud Prevention

This section of the study presents inferential statistics of the various variables of the study. The study used fraud prevention as the dependent variable, control environment, risk assessment, control activities, communication of information and monitoring as independent variables. Compliance with prudential regulations was used as moderating variable. First the results on test of assumptions were presented, ANOVA test and regression analysis models were presented for independent variables and also after incorporating the moderating variable.

Test of assumptions is important for researchers utilizing multiple regression or other statistical technique as serious violation of these tests can lead to biased estimates, wrong confidence intervals and significance levels as well as over or under-confident regression coefficients (Williams, Grajales & Kurkiewicz, 2013). This section shows the results of normality, multicollinearity autocorrelation and heteroskedastic tests.

4.6.1 Test of Data Normality

Shapiro-Wilk (SW) test is used to test normality of data if the number of items ranges between three and five thousand ($3 \leq n \leq 5000$) (Razali & Wah, 2011). The sample size of the study was 39 banks and therefore the SW test was ideal for testing normality. The value of statistic (W) in Shapiro-Wilk (SW) test of normality should lie between one and zero, a small value of W indicates lack of normality while one shows existence of normality (Razali & Wah, 2011). Sullivan and Artino (2013) indicated that based on clear evidence from simulated and actual data, parametric tests can be used in Likert scale type of data to give right answers even when assumption of normality is violated even for great degree. Table 4.9 gives the results of normality test of the variables.

Table 4.9 Test of Data Normality Results

	Shapiro-Wilk		
	Statistic	df	Sig.
Control Environment	.950	33	.130
Control Activities	.951	33	.146
Risk Assessment	.971	33	.517
Communication	.960	33	.254
Monitoring	.927	33	.030

Razali and Wah, (2011) stated that the value of statistics (W) is between one and zero and that the value of one indicates normality of data. Table 4.9 shows that the value of all independent variables lies between 0.927 and 0.971 which is near one. Nganga (2014) stated that, if the p-value exceeds the selected alpha level, the null hypothesis is rejected and concluded that the data is from a normally distributed population. The values of p in table 4.3 are above p of 0.05 except monitoring which is 0.03. Violations of normality assumption of a sample in excess of 30 should not cause problems and parametric procedures can be used (Ghasemi & Zahediasl, 2012)

4.6.2 Multicollinearity Test

The data was subjected to multicollinearity test. Tolerance and VIF were applied to test the multicollinearity. Existence of multicollinearity among independent variable will lead to wrong regression results (Palaniappan, 2017). Multicollinearity makes it difficult to

interpret the results (Adeboye, Fagoyinbo, & Olatayo, 2014). The results of multicollinearity test are shown in table 4.10

Table 4.10: Multicollinearity Test Results

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Control Environment	.704	1.421
Control Activities	.663	1.509
Risk Assessment	.413	2.419
Communication	.559	1.789
Monitoring	.361	2.771

The results from the test show that the tolerance is between 0.361 and 0.704, whereas the VIF is between 1.421 and 2.771. The parameters conform to suggestion by Khalaf and Iguernane (2016) who indicated that any value of VIF beyond 10 indicates presence of multicollinearity. Therefore, it was prudent to conclude that there was no multicollinearity between the independent variables.

4.6.3 Test of Autocorrelation of Variables

Durbin Watson test was applied to test autocorrelation. Durbin Watson test ranges between 0 and 4, value of less than one and a value of more than three are cause of concern (Field, 2016). The results are shown in table 4.11

4.11: Autocorrelation Test Results

Change Statistics					Durbin-Watson
R Square Change	F Change	df1	df2	Sig. F Change	
.473	4.849	5	27	.030	2.141

The value of Durbin-Watson should range between 1.5 and 2.5 to indicate the values are independent (Gan & Ahmad, 2011). The value of Durbin-Watson test statistics of 2.141

indicated in the table 4.5 was in between 1.5 and 2.5 as suggested by Gan and Ahmad (2011). Therefore, the assumption of error terms' independence was met.

4.6.4 Construct Validity Test

Construct validity refers how the ideas or concepts are operationalized (Drost, 2011). Construct validity is a necessary rigorous validity process that enable researcher to draw a legitimate conclusion from the survey (Burton & Mazerolle, 2011). Construct validity can be measured using different approaches, however this study utilised convergent and discriminant validity tests. The convergent validity was measured using average variance extracted (AVE) of standardized estimates and the loading must be above 0.5. The discriminant validity was estimated as the difference between the AVE and the squared correlation coefficients between different variables. The square root of AVE must exceed the correlation between variables for discriminant validity to be fulfilled (Kimani, 2015). The AVE for control environment (CV) was 0.684, risk assessment (R) was 0.594, control activities (A) was 0.591, communication of information (C) was 0.559, monitoring of controls (M) was 0.510, compliance with prudential regulations (G) was 0.752 and fraud prevention (F) was 0.506. The results on square roots of the AVE for the variable were as follows; CV= 0.827, R= 0.771, CA= 0.769, C= 0.748, M= 0.714, G= 0.867 and F= 0.711 as shown on table 4.12. These parameters meet the threshold indicated by (Kimani, 2015). Therefore, it was concluded that the research study met both convergent and discriminant validity threshold.

4.12: Convergent and Discriminant validity Tests Results

	AVE	CV	R	CA	C	M	G	F
CV	0.684	0.827						
R	0.594	0.125	0.771					
CA	0.591	0.190	0.162	0.769				
C	0.559	0.089	0.071	0.263	0.748			
M	0.510	0.219	0.008	0.240	0.047	0.714		
R	0.752	0.033	0.016	0.020	0.024	0.250	0.867	
F	0.506	0.256	0.299	0.588	0.578	0.276	0.06	0.711

4.6.5 Test of Heteroscedasticity

The variances of errors are assumed to be constant across all observations. Breuch Pagan and Koenker test was carried out to confirm existence of non-constant variances of errors in the data (Osoro, Muturi &Ngugi, 2015). The results of heteroscedasticity are represented in table 4.13

Table 4.13: Test Results of Heteroscedasticity

	LM	Sig
BP	6.883	.230
Koenker	6.851	.232

The criteria to determine the presence of heteroscedasticity is the probability value which should be more than 0.05 in order not to reject the null hypothesis that there is no heteroscedasticity (Ali, Ormal & Ahmad, 2018). The results presented in table 4.13 shows that the p values of Breuch Pagan and Koenker tests are above 0.05 and therefore it was concluded that the data was homoscedastic.

4.7 Correlation of Variables

Correlation is the measure of relationship between variables and coefficient of correlation shows the strength of the relationship between variables (Gan & Ahmad, 2011). Multicollinearity arises when inter-correlation among independent variables is high, in that the effect of independent variables cannot be separated. Inter-correlation values of above 0.8 among independent values indicate multicollinearity problems (Garson, 2012). The values of correlation shown in table 4.14 shows that there is no inter-correlation and therefore all independent variables were fully utilized in the study. These results have been collaborated by the tolerance and VIF tests shown in table 4.10 which showed that there is no multicollinearity between independent variables.

Table 4.14: Correlation Matrix

		Fraud Prevention	Control Environment	Control Activities	Risk Assessment	Comm.	Monitoring
Fraud Prevention	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	33					
Control Environment	Pearson Correlation	-.454**	1				
	Sig. (2-tailed)	.008					
	N	33	33				
Control Activities	Pearson Correlation	.368*	-.080	1			
	Sig. (2-tailed)	.035	.657				
	N	33	33	33			
Risk Assessment	Pearson Correlation	.505**	-.124	.441*	1		
	Sig. (2-tailed)	.003	.490	.010			
	N	33	33	33	33		
Comm.	Pearson Correlation	.480**	-.432*	.076	.630**	1	
	Sig. (2-tailed)	.005	.012	.675	.000		
	N	33	33	33	33	33	
Monitoring	Pearson Correlation	-.547**	.443**	-.293	-.427*	-.582**	1
	Sig. (2-tailed)	.001	.010	.098	.013	.000	
	N	33	33	33	33	33	33

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

4.8 Factor Analysis

Factor analysis is used in reduction of variables to a few variables also referred to as factors. It is also used to provide evidence on construct validity on self-reporting scales (Williams, Onsman & Brown, 2010). The study utilized exploratory factor analysis as it enables the researcher analyse dimensions from a large number of variables to generate a model (Williams, Onsman & Brown, 2010). In order to check factorability of variables one needs to carry out test on adequacy of the sample using Kaiser-Meyer-Olkin (KMO) which supplements Bartlett's test of sphericity (Watkins, 2018). The factor analysis should be based on each independent variable for easy interpretation. The factors that have cross loading of 0.4 and above should be removed (Samuels, 2016).

The KMO test on adequacy of sample and Bartlett's test of sphericity were carried out. The indexes as applied in KMO should be between 0 and 1 and a value of 0.5 or more is considered appropriate in testing the adequacy of sample (Williams, Onsman & Brown, 2010). Bartlett's test of sphericity tests the hypothesis that the correlational matrix contains ones on the main diagonal and zeros on other diagonals (Watkins, 2018). The Bartlett's test statistics should be significant at a point where p is less than 0.05 to ensure suitability of factor analysis (Williams, Onsman & Brown, 2010). Table 4.15 shows the KMO test on adequacy of sample and Bartlett's test of sphericity tests.

Table 4.15: KMO and Bartlett's Test Results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.606
Bartlett's Test of sphericity	Approx. Chi-Square	341.713
	df	171
	Sig.	.000

The results shown on table 4.15 shows that the sample is adequate as the KMO index of 0.606 is beyond the minimum requirement of 0.5 and Bartlett's test of sphericity is significant as p value is 0.0001 which is below 0.05 as suggested by Williams, Onsman and Brown (2010). Therefore, it was concluded that data was suitable for factorability.

4.8.1 Extraction of Factors

In multiple regressions, a large number of variables will cause multicollinearity or difficulty in identifying the variables (Tong, Wang, & Xu, 2014). The study utilised principal component analysis (PCA) in extraction of factors. In factor analysis PCA is suitable where a researcher has developed an instrument and would need to reduce the number of latent variables. This method is preferable when there are no prior models or theoretical basis exist (Taherdoost, Sahibuddin, & Jalaliyoon, 2014). Tong, Wang, & Xu (2014) stated that this method is suitable to ensure that there are few sets of linear combinations of uncorrelated covariates which reduce chances of multicollinearity. PCA will also ensure that the linear combinations selected in regression have maximum variances. Varimax also reduces the number of variables with high loadings with each other and make smaller loadings even smaller (Yong & Pearce, 2013). Varimax rotation method was used to facilitate simple interpretation of factor loadings. Varimax method provides simple structure of factor loading. This was used as it produces results that are uncorrelated as explained by Taherdoost, Sahibuddin and Jalaliyoon (2014). Table 4.16 shows the description of extracted variables whereas table 4.17 shows the factor loading of extracted variables.

Table 4.16: Description of Extracted Variables

Latent Variable	Label of Latent Variable	Observable Variable
G3	Penalties provided by the Regulations are sufficient	
G1	Provision of Regulations by the government	Compliance
G2	Regulations provided by government are effective	with Prudential
G5	Adherence to the laws provided by the government	Regulations
R3	Mechanisms of identifying potential risks	
R6	Response to potential risks	Risk
R9	Periodic reconciliations for transactions	Assessment
R1	Mechanisms for Mitigation of risks	
CV2	Chain of command in the organization	
CV5	Mechanisms of promoting and compensating employees	Control
CV3	Follow-up on delegated responsibilities	Environment
CA2	Regular reconciliation of transactions	
CA6	Proper verification of supporting documents	Control
CA3	Application of proper accounting principles	Activities
M8	Investigation and rectifications of complaints	
M1	Mechanisms for evaluation of activities	Monitoring of controls
M10	Management take corrective measures	
C7	Evaluation of information	Communication
C1	Easier, quicker and safe means of passing information	of
C6	Restriction to accessibility of information	Information
F2	Mechanisms to identify, measure and analyze risk	Fraud
F1	Establishment of structures	Prevention

Factor analysis on ICS and fraud prevention established that seven factors had Eigen values in excess of one. Eigen values were applied in establishing factors that were to be used for further analysis. Samuels (2016) indicated that factors with Eigen values in excess of one were suitable to be used for analysis. It was established that not less than

three factors should be retained (Kimani, 2015). The seven factors retained explained 76.008% as shown in Eigen values in appendix IV.

Table 4.17: Factor Loading Matrix

	Component						
	1	2	3	4	5	6	7
G3	.936						
G1	.909						
G2	.908						
G5	.783						
R3		.866					
R6		.807					
R9		.805					
R1		.738					
CV2			.853				
CV5			.842				
CV3			.824				
CA2				.843			
CA6				.728			
CA3				.607			
M8					.718		
M1					.686		
M10					.598		
C7						.821	
C1						.803	
C6						.555	
F2							.820
F1							.754

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 8 iterations.

4.8.2 Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was undertaken after exploratory factor analysis that was applied in extraction of variables. Under confirmatory factor analysis various test were undertaken. First test on how the correlation of variables was altered based on the method instead of constructs. The common method bias was applied to determine the effect of method on correlation of variables. Common bias method or variances may arise where the research is undertaken in one area and the responses are derived from a single source. The respondents may also provide same answers or answers that are unrelated to survey and therefore create false correlations (Bell, 2019). Common latent factor is suitable to establish common bias. The standardized regression weights are applied while determining the common method bias and should not exceed 20% (0.20) as indicated by Kimani (2015). The results in figure 4.1 show a common bias method value of 2.25% (0.15^2), therefore, indicating the responses were within the recommended threshold. This implies that there was no systematic bias in responses derived from respondents in the study.

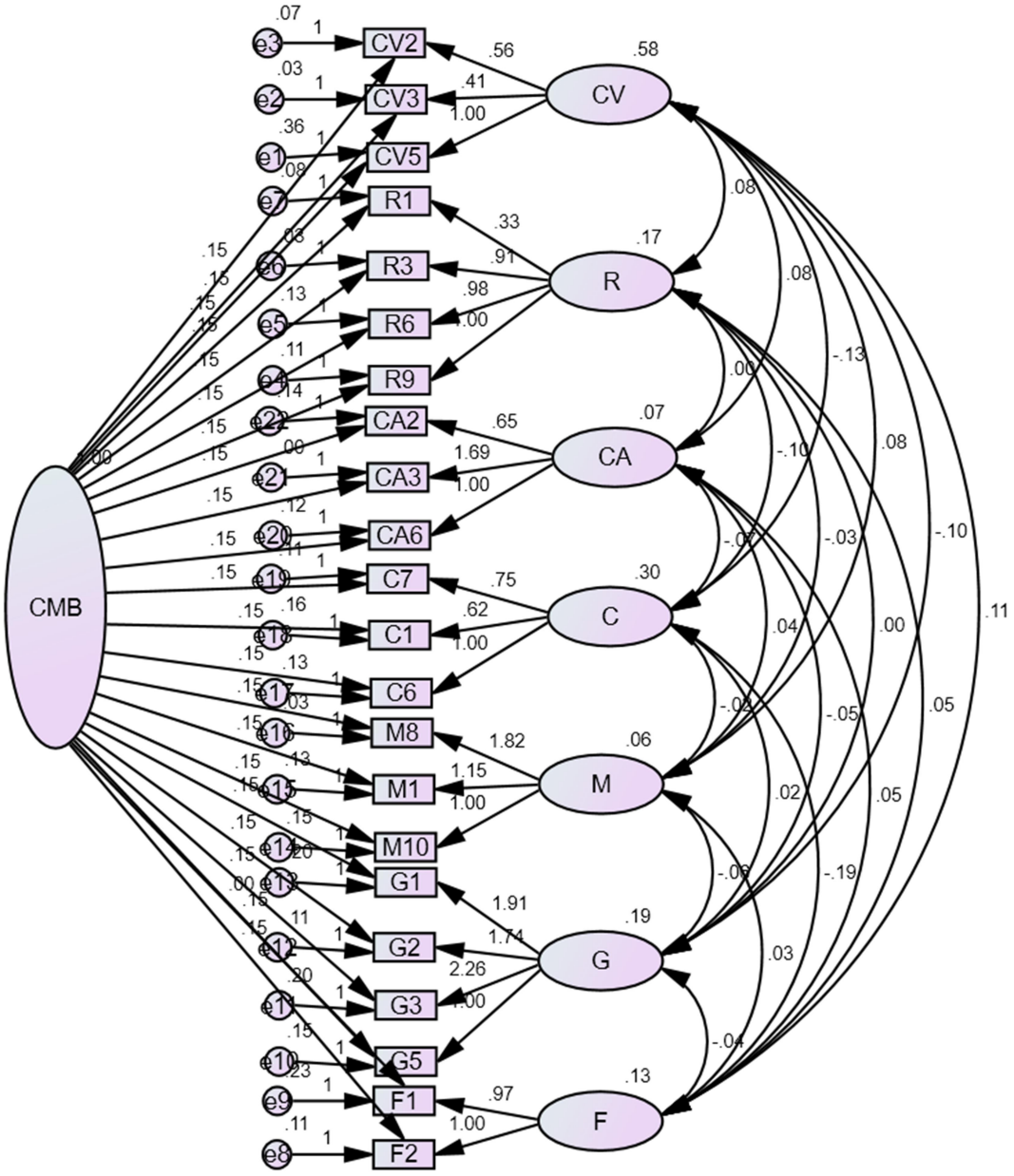

Figure 4.1 Common Method Bias

The confirmatory factor analysis results are shown in figure 4.2. Confirmatory factor analysis indicates the existence of relationship between specific items and factors (Sarstedt & Mooi, 2019). Kimani (2015) indicated that the latent variable loadings must be at least 0.4 to establish the relationship between the latent variable and construct. The test results show that all the loadings are above 0.4 as suggested by Kimani (2015), this

implies that there exist relationship between all the latent variables and constructs and therefore all latent variables were used for further analysis.

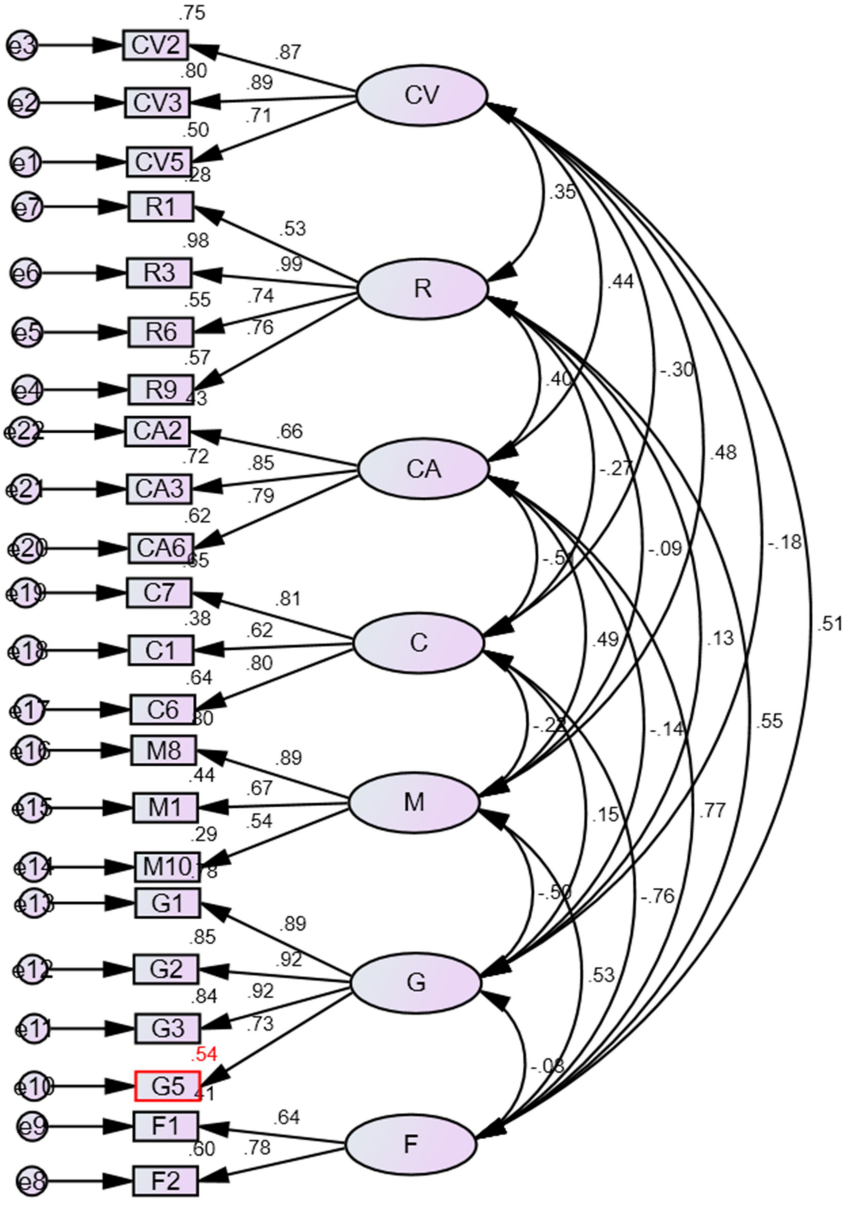

Figure 4.2 Confirmatory Factor Analysis

4.8.3 Model fit Test for Un-Moderated Regression Model

The overall model fit for un-moderated regression model was undertaken using chi-square, CMIN/DF, comparative fix index (CFI), root mean square for error approximation (RMSEA), pclose and standardized root mean residual (SRMR) as suggested by Shopati, Mitonga and Aipinge (2018). The criteria or cut off points for the various goodness of fit statistics were as follows; chi-square should be equal or greater than 0.05, CMIN/DF should be between 1 and 3, CFI should be equal or greater than 0.8, RMSEA should be more than 0.05, pclose should be less than 0.05 (Kanda & Handa, 2018). Shopati, Mitonga and Aipinge (2018) indicated that the threshold of SRMR should be less than 0.08. The results presented in table 4.18 show the chi-square of 143.731, df of 128 and p value of 0.162. The CMIN/DF of 1.123, CFI of 0.938, RMSEA of 0.062, pclose of 0.361 and SMRM of 0.203. SMRM falls outside the limit suggested by Shopati, Mitonga and Aipinge (2018). The other parameters obtained are all within the threshold suggested by (Kanda & Handa, 2018). Therefore, it was concluded that the overall model fit well. Table 4.18 shows model fit statistics and evaluation.

Table 4.18 Model fit Test Results for Regression Model

Measure	Cut-off Value	Estimates	Model Evaluation
Chi-square	$p \geq 0.05$	$\chi^2 = 143.731$, df= 128, p = 0.162	Model Fit
CMIN/DF	Between 1 and 3	1.123	Model Fit
CFI	≥ 0.8	0.938	Model Fit
RMSEA	≤ 0.08	0.063	Model Fit
Pclose	> 0.5	0.361	Model Fit
SMRM	≤ 0.08	0.203	Model Un-fit

4.9 Hypothesis Test Results on Effect of ICS on Fraud Prevention

In this section the results of hypothesis testing are presented. Individual variables are also analysed and presented. The strength of the relationship between variables can be interpreted from either direction, the strength of relationships ranges between 0.91 to 1.00 for very strong, 0.71 to 0.90 for strong relationship, 0.51 to 0.70 for medium relationship,

0.31 to 0.50 for weak relationship, 0.01 to 0.30 for very weak relationship and 0.00 for no correlation (Gan & Ahmad, 2011). The regression results in figure 4.3 show coefficient of variation value of 0.92 (R^2 = 0.92). This means that the ICS explains 92% of variability in fraud prevention in banking sector in Kenya.

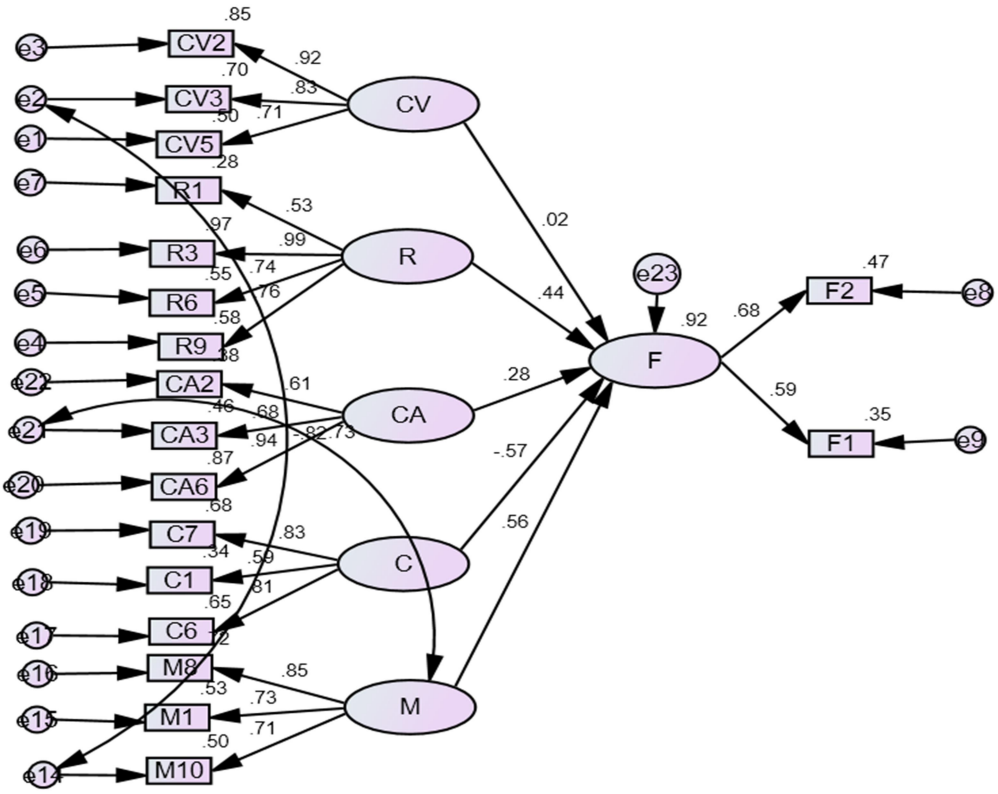

Figure 4.3 Un-Moderated Structural Equation Model (SEM)

Table 4.19 shows the regression results of effects of ICS and fraud prevention in banking sector in Kenya

Table 4.19: Regression Results of Effect of ICS on Fraud Prevention

			Estimate	S.E.	C.R.	P
Fraud Prevention	<---	Control environment	.009	.086	.104	.917
Fraud Prevention	<---	Risk assessment	.339	.146	2.326	.020
Fraud Prevention	<---	Control activities	.205	.137	1.498	.134
Fraud Prevention	<---	Communication	-.372	.141	-2.639	.008
Fraud Prevention	<---	Monitoring	.498	.182	2.734	.006

4.9.1 Hypothesis Testing on Effect of Control Environment on Fraud Prevention

The first objective of the study was to examine the effect of control environment in fraud prevention in banking sector in Kenya. The data was collected using questionnaire designed in form of statements that were scaled using 5-point Likert scale. A composite scale on parameters used to measure control environment and fraud prevention was computed based on factor loading and then used for hypotheses testing. In order to carry this analysis, the following hypotheses were used:

H_{o1}: Control environment has no significant effect on fraud prevention in banking sector in Kenya.

Ha_1: Control environment has significant effect on fraud prevention in banking sector in Kenya.

The results shown on table 4.19 indicate a t value (critical ratio) of 0.104 and p value of 0.917 which is greater than the critical p value of 0.05. The p value from the test was insignificant, therefore the null hypothesis was not rejected and it was concluded that control environment has no significant effect on fraud prevention. The control environment and fraud prevention are shown to have weak positive relation (B = 0.009) as per the ranges provided by Gan and Ahmad (2011). These results were similar to those of Thao (2018) which showed that control environment has weak positive effect on ICS in private commercial banks. The study findings deviated from other studies which showed different results. Study by Gesare, Nyangol and Odongo (2016) found that that control environment has a significant positive influence on fraud risk management in banks in Kisii town. Kumuthinidevi (2016) concluded that control environment within private bank moderately support effectiveness of ICS. In a different study's findings, the

control environment was found to have significant effect on financial performance (Etengu & Amony, 2016). The findings by Amudo and Inanga (2009) showed that control environment was not effective and efficient in providing reliable financial reporting. In research study by Koech and Kimani (2018), it was concluded that control environment has significant relationship with fraud detection and prevention.

The control environment from inferential analysis has been shown to have weak positive relationship with fraud prevention. This relationship shows that though the respondents strongly agree on control environment parameters as per the descriptive statistics (composite mean = 4.38461), practically the mechanisms applied do not eliminate fraud cases in organizations. The inferential findings that shows weak relationship between the control environment and fraud prevention was not expected, this is because control environment includes integrity issues, code of conduct, competencies of employees, proper chain of command among other factors that ensures that the recruited personnel are well scrutinized to ensure employees are of high integrity and competent. This weak relationship may be due non-compliant with strict management hiring guidelines or nepotism in recruitments.

The managements of the organizations must refocus on control environment to ensure that the policies and procedures put in place to assess the competences and integrity of employees are revised, enforced and proper continuous evaluations are carried out. The control environment affects all other components and as such greater emphasis on their proper working should be ensured. Proper control environment should facilitate fraud prevention.

4.9.2 Hypothesis Testing on Effect of Risk Assessment on Fraud Prevention

The study assessed the effect of risk assessment on fraud prevention in banking sector in Kenya as the second objective. The data used for the test of the hypotheses was in form of statements that were ranked in Likert scale data. The respondents were requested to tick an appropriate box that had scale of 1 to 5 in order to express their view on effect of risk assessment on fraud prevention in banking sector. The scales represented; 1 strongly

disagree, 2 disagree, 3 indifferent, 4 agree and 5 strongly agree. Karl Pearson's product moment coefficient of correlation was used to measure the strength and indicate the direction of the relationship between risk assessment and fraud prevention. In order to carry this analysis, the following hypotheses were used:

H_{o2}: Risk assessment has no significant effect on fraud prevention in banking sector in Kenya.

Ha_2: Risk assessment has significant effect on fraud prevention in banking sector in Kenya.

The study findings presented in table 4.19 shows that risk assessment has statistically significant effect on fraud prevention (ß=0.339, t= 2.326, p = 0.020 < 0.05). Therefore, the null hypothesis was rejected and it was concluded that risk assessment has significant effect on fraud prevention. Gan and Ahmad (2011) stated the strength of relationship between 0.01 and .30 shows very weak relationship. Therefore, the results indicate weak positive relationship between the risk assessment and fraud prevention.

The study findings indicated in table 4.19 shows that risk assessment has weak (B=0.339) significant positive relationship with fraud prevention. Akwaa-Sekyi (2017) in their findings also found that there was weak significant effect of risk assessment on credit risk. These findings are contrary to the findings by Thao (2018) who found that there was moderate significant effect of risk assessment on ICS. Gesare, Nyangol and Odongo (2016) concluded that there was significant positive relationship between risk assessment and fraud risk management. This meant that the quality of risk assessment directly affects the quality of fraud risk management. Amudo and Inanga (2009) in their study indicated that the risk assessments put in place by African Development Bank (AfDB) were not efficient in addressing problems in projects initiated.

The study findings show although the respondents strongly agree on risk assessment mechanisms put in place, the mechanisms do not necessarily close all the loopholes that are manipulated by fraudsters to commit fraud. Thus, much has to be done to prevent fraud from happening. Risk assessment as a component of ICS is very important; this is

because it ensures that risk is detected early enough before it occurs. When the management is aware of any risk potential it puts in place mechanisms to thwart such fraudulent activities. The study findings show that risk assessment contributes little in fraud prevention and therefore mechanisms put in place to identify, analyse, estimate and mitigate risks should be tightened and enhanced so that they can completely seal off loopholes both in regulations and organization policies.

4.9.3 Hypothesis Testing on Effect of Control Activities on Fraud Prevention

The third objective of the study was to evaluate the effect of control activities on fraud prevention in banking sector in Kenya. The data used for the test of the hypothesis was in form of statements that were scaled in Likert scale data. The respondents were requested to tick an appropriate box that had scale of 1 to 5 in order to express their view on effect of control activities on fraud prevention in banking sector. The scales represented; 1 strongly disagree, 2 disagree, 3 indifferent, 4 agree and 5 strongly agree.

Karl Pearson's product moment coefficient of correlation was used to measure the strength and indicate the direction of the relationship between control activities and fraud prevention. The inferential analysis on the third objective was carried out. The composite scale on the parameters used as per factor analysis to measure control activities and fraud prevention were used to test the hypothesis. In order to carry this analysis, the following hypotheses were used:

H_{o3}: Control activities have no significant effect on fraud prevention in banking sector in Kenya.

H_{a3}: Control activities have significant effect on fraud prevention in banking sector in Kenya.

Regression coefficient values on control activities provided in table 4.19, indicated that the control activities have no statistically significant effect on fraud prevention (ß=0.205, t=1.498, p = 0.134>0.05). Therefore, null hypothesis was not rejected and it was concluded that control activities have no significant effect on fraud prevention. Research study findings presented in table 4.27 shows that the control activities have

weak positive insignificant effect (B=0.205) on fraud prevention in banking sector in Kenya. These study findings are similar to the studies by Amudo and Inanga (2009), in their study they indicated that the control activities functionalities were weak, although they added an override and stated that the malfunctioning is purely due to problems with control environment. The study findings were contrary to the study conducted by Thao (2018) which concluded that control activities were neutral in effectiveness on internal controls. Kumuthinidevi (2016) found that control activities within the banks included in the research had moderate effectiveness on ICS. Okonkwo and Linda (2016), on their study concluded that control techniques that had been employed were effective in mitigating fraud in banks. The inferential statistics analysis shows that the control activities have insignificant effect in fraud prevention. This conclusion may be due to old control activities that were established and which were not able to deal with ever changing and sophisticated methods applied by the fraudsters to commit fraud. There may also be laxity in strictly applying controls due to employees being close to one another and therefore becoming fond of each other, hence would not like to be treating each other "un-fairly" by scrutinizing their activities.

The descriptive statistics results show a composite mean of 4.3824, this show that the respondents strongly agree that the control activities established by the banks were effective in fraud prevention. This strong agreement may due to proper strong controls that have been established. The ratings could also be due to the responsibilities bestowed upon the respondents, since the respondents bear the burden of safeguarding the assets, they may have introduced proper and strong control mechanisms to protect the resources of their organizations.

4.9.4 Hypothesis Testing on Effect of Communication of Information on Fraud Prevention

The fourth objective of the study was to determine the effect of communication of information on fraud prevention in banking sector in Kenya. The inferential analysis on this objective was undertaken. The data used for the test of the hypothesis was in form of statements that were ranked in Likert scale data. The respondents were requested to

tick an appropriate box that had scale of 1 to 5 in order to express their view on effect of communication of information on fraud prevention in banking sector. The scales represented; 1 strongly disagrees, 2 disagree, 3 indifferent, 4 agree and 5 strongly agree. Karl Pearson's product moment coefficient of correlation was used to measure the strength and indicate the direction of the relationship between communication of information and fraud prevention. The composite scale on the parameters selected using factor loading were used to measure communication of information and fraud prevention were used to test the hypothesis. In order to carry this analysis, the following hypotheses were used:

H_{o4}: Communication of information has no significant effect on fraud prevention in banking sector in Kenya.

H_{a4}: Communication of information has significant effect on fraud prevention in banking sector in Kenya.

The regression results shown in table 4.20 indicate that communication of information has statistically significant effect on fraud prevention (ß= -0.372, t= -2.639, p=0.008 < 0.05). Therefore, the null hypothesis was rejected and it was concluded that communication of information has significant effect on fraud prevention. The findings showed that communication of information has a weak negative relationship with fraud prevention (B= -0.372). This study is closely related to a study carried out by Adetiloye, Olokoyo and Taiwo (2016) that concluded that internet and other communication of information and technology meant to improve delivery of services in banks, led to increased frauds situation in banks. The research findings however did not agree with findings of Kumuthinidevi (2016) that showed that communication of information procedures such as accounting procedures, adoption of technological measures, prevention of technological failures and communication method implemented around the bank were moderate in supporting the effectiveness of ICS. Mwithi and Kamau (2015) found that technology embraced by banks for capturing and dissemination of information reduced cases of fraud as compared with manual operations.

Inferential statistics results indicate that communication of information does not contribute effectively on fraud prevention. The communication of information did not

contribute positive results in fraud prevention this may be due to wrong information being passed, the information passed was not acted upon or bureaucratic nature of dealing with received information took too long and therefore when acted upon the perpetrators had already accomplished their mission.

4.9.5 Hypothesis Testing on Effect of Monitoring of Activities on Fraud Prevention

The fifth objective of the study was to establish the effect of monitoring of activities on fraud prevention in banking sector in Kenya. The inferential analysis on this objective was undertaken. The data used for the test of the hypothesis was in form of statements that were ranked in Likert scale data. The respondents were requested to tick an appropriate box that had scale of 1 to 5 in order to express their view on effect of monitoring of activities on fraud prevention in banking sector. The scales represented; 1 strongly disagree, 2 disagree, 3 indifferent, 4 agree and 5 strongly agree. Karl Pearson's product moment coefficient of correlation was used to measure the strength and indicate the direction of the relationship between monitoring of activities and fraud prevention.

The composite scale on the parameters selected based on factor analysis results were used to measure monitoring of activities and fraud prevention were used to test the hypothesis. In order to carry this analysis, the following hypotheses were used:

H_{o5}: Monitoring of activities has no significant effect on fraud prevention in banking sector in Kenya.

H_{o5}: Monitoring of activities has significant effect on fraud prevention in banking sector in Kenya.

Table 4.19 shows the research findings on regression on the effect of monitoring of activities on fraud prevention. The results show that the monitoring of activities has significant effect on fraud prevention ($t = 2.734$, $p = 0.006 < 0.05$). Based on the results the null hypothesis was rejected and it was concluded that monitoring of activities has significant effect on fraud prevention. Gan and Ahmad (2011), scale rated a beta of between 0.31 and 0.50 as weak relationship, therefore Karl Pearson's product moment coefficient of correlation ($B = 0.498$) of monitoring of controls show weak positive relationship between monitoring of controls and fraud prevention.

The study findings were similar to the studies by Etengu and Amony (2016) in their study concluded that monitoring significantly affect financial performance and study by Ayagre, Appiah-Gyamerah and Nartey (2014) on effectiveness of ICS of banks in Ghana which found that monitoring activities on ICS were effective in the banks. The findings of the study were contrary to the findings by Amudo and Inanga (2009) who evaluated ICS in Uganda, it was found that monitoring of activities in projects did not function properly, though the weaknesses were attributed to weak control environment. The study findings were also different from other study undertaken by Kumuthinidevi (2016) which concluded that self-assessment or monitoring had moderately supported the level of effectiveness of ICS.

Descriptive statistics results on monitoring of activities indicated that respondents strongly agree that the parameters used in measuring control of activities were effective. The high ratings by the respondents may be attributed to keen interest that managers put in monitoring whatever was happening within the organizations. The respondents may have put in place mechanisms to ensure tasks that are delegated are supervised well or have established peer evaluations to ensure each person's task is evaluated by another colleague. The independent evaluators could have also contributed to ensure that the loopholes that may be manipulated by fraudsters have been sealed. The respondents who are at the top of management in bank branches could also be competent in monitoring or may have given higher ratings to boost the investors' confidence in their organizations to safeguard their investments.

4.9.6 Analysis of Moderating Effect of Compliance with Prudential Regulations on the Relationship between ICS and Fraud Prevention

The sixth study objective was to establish the moderating effect of compliance with prudential regulations on the relationship between the ICS and fraud prevention in banking sector in Kenya. Composite index of the parameters used to measure compliance with prudential regulations were computed. The hypotheses on the various independent variables and the moderator were tested, results interpreted and discussions provided on the objective. Figure 4.4 shows the moderating effect of compliance with prudential regulations on the relationship of each component of ICS and fraud prevention. The

results presented in figure 4.4 show that the ICS and compliance with prudential regulations (ICS* compliance with prudential regulations) explains 70% ($R^2 = 0.70$) of the variability in fraud prevention in banking sector in Kenya. The results therefore indicate that the compliance with prudential regulations has -22% (70% - 92%) moderating effect on the relationship between the ICS and fraud prevention in banking sector in Kenya. This negative contribution of compliance with prudential regulations of about -22% implies that, though there are regulations that govern the operations of banks in regard to various aspects of ICS, the regulations did not enhance the ICS as expected. This may be due to non-adherence to regulations provided by regulating bodies or the perpetrators of fraud might have found loopholes in the regulations that they use to their advantage.

The parameters used in figure 4.4 represent; control environment and compliance with prudential regulations (CV_G), risk assessment and compliance with prudential regulations (R_G), control activities and compliance with prudential regulations (CA_G), communication of information and compliance with prudential regulations (C_G), monitoring of controls and compliance with prudential regulations (M_G) and fraud prevention (ZF).

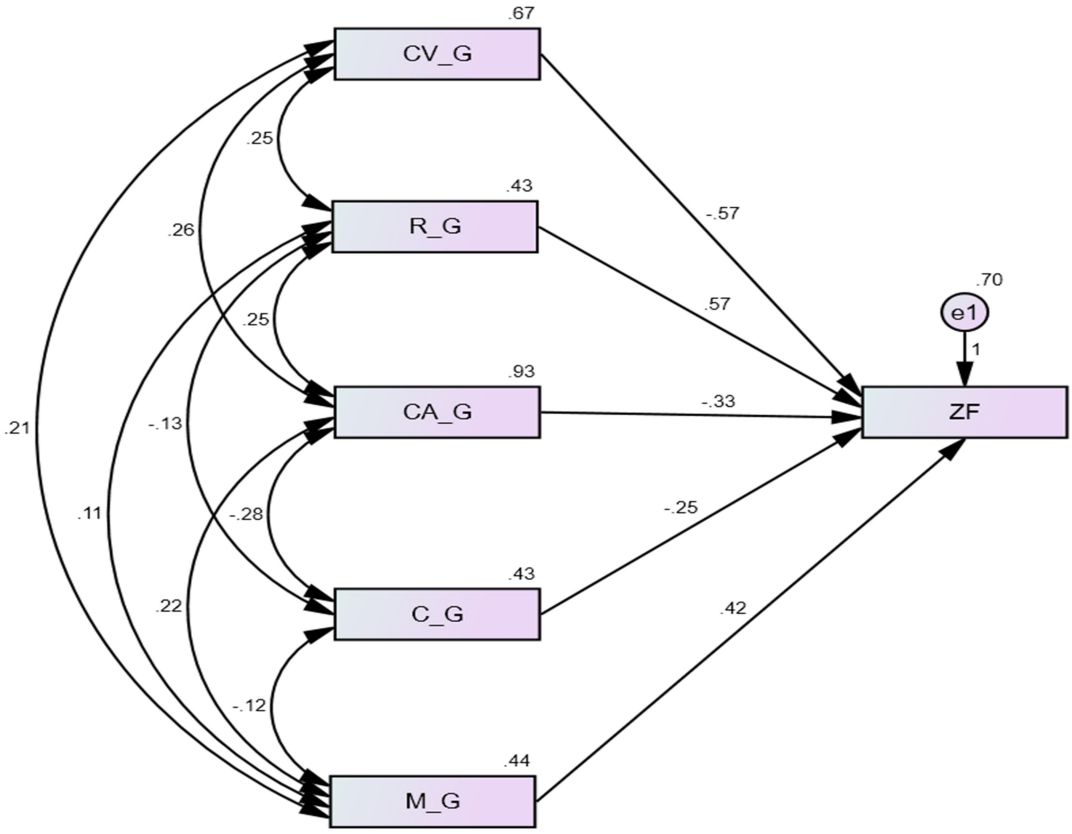

Figure 4.4 Moderated Structural Equation Model (SEM)

The results on moderating effect of compliance with prudential regulations on the relationship between the ICS and fraud prevention in banking sector in Kenya are shown in table 4.20. Based on the objective to establish the moderating effect of compliance with prudential regulations on the relationship between the ICS and fraud prevention in banking sector in Kenya, individual hypotheses were created based on each component of ICS to test the significance of moderation of compliance with prudential regulations on ICS in fraud prevention. The study hypothesized that:

H_{o6}: Compliance with prudential regulations has no moderating effect on the relation between ICS and fraud prevention in banking sector in Kenya.

H_{a6}: Compliance with prudential regulations has moderating effect on the relation between ICS and fraud prevention in banking sector in Kenya.

Based on sixth null hypothesis that the compliance with prudential regulations has no moderating effect on the relation between ICS and fraud prevention in banking sector in Kenya, the study formulated five hypotheses on the various components of ICS and interpreted them independently.

Table 4.20: Regression Results on Moderating Effect of Compliance with Prudential Regulations on Relationship between ICS and Fraud Prevention

			Estimate	S.E.	C.R.	P
Fraud prevention	<---	Control environment and Compliance with prudential regulations	-.567	.228	-2.490	.013
Fraud prevention	<---	Risk assessment and Compliance with prudential regulations	.567	.274	2.068	.039
Fraud prevention	<---	Control activities and Compliance with prudential regulations	-.326	.190	-1.713	.087
Fraud prevention	<---	Communication and Compliance with prudential regulations	-.251	.271	-.927	.354
Fraud prevention	<---	Monitoring and Compliance with prudential regulations	.416	.254	1.640	.101

Table 4.20 shows the regression results on moderating effect of compliance with prudential regulations on ICS in fraud prevention. The results indicate the various coefficients of independent variables, t values and p values that were used to test

hypothesis on moderating effect of compliance with prudential regulations on various independent variables in fraud prevention. The components of ICS were used to develop hypotheses on moderating effect of compliance with prudential regulations on the relationship between ICS and fraud prevention. The first hypothesis was:

H_{01}: Compliance with prudential regulations does not moderate relationship between control environment and fraud prevention in banking sector in Kenya.

H_{a1}: Compliance with prudential regulations moderates relationship between control environment and fraud prevention in banking sector in Kenya.

The study findings on table 4.20 shows that control environment has a t value of -2.490 and a p value of 0.013 which is less than the critical p value of 0.05. The t value is less than the critical value of -1.694 and falls in rejection region. Therefore, the null hypothesis was rejected and it was concluded that compliance with prudential regulations moderates the relationship between control environment and fraud prevention. The results implies that the regulations provided by regulating authorities and government do affect the organization culture and operations.

The study also hypothesised that:

H_{02}: Compliance with prudential regulations does not moderate relationship between risk assessment and fraud prevention in banking sector in Kenya.

H_{a2}: Compliance with prudential regulations moderates relationship between risk assessment and fraud prevention in banking sector in Kenya.

The study results on table 4.20 indicate that risk assessment has t value of 2.068 and p value of 0.039 which is less than critical p value of 0.05 thus significant. Therefore, it was concluded that compliance with prudential regulations moderates the relationship between risk assessment and fraud prevention. This implies that compliance with prudential regulations helps in assessing and preventing risks of fraud or the organizations do consider the legislative and regulatory framework to be important to be used in organizations to assess and act on risk of fraud.

The third hypothesis from the sixth objective on moderating effect of compliance with prudential regulations on the relationship between the ICS and fraud prevention was:

H_{03}: Compliance with prudential regulations does not moderate relationship between control activities and fraud prevention in banking sector in Kenya.

H_{a3}: Compliance with prudential regulations moderates relationship between control activities and fraud prevention in banking sector in Kenya.

The test statistics of control activities are t = -1.703 and p = 0.087 as shown in table 4.20. These values are less and greater than critical values of t = -1.694 and p = 0.05 respectively. Therefore, the null hypothesis was not rejected and it was concluded that compliance with prudential regulations does not moderate relationship between control activities and fraud prevention. The findings implies that the laws and regulations provided by government and other regulatory authorities are not effective in ensuring that the control activities are strengthened and have not sealed all loopholes that might be capitalised on by the fraudsters to commit fraud.

The study also hypothesised that:

H_{04}: Compliance with prudential regulations does not moderate relationship between communication of information and fraud prevention in banking sector in Kenya.

H_{a4}: Compliance with prudential regulations moderates relationship between communication of information and fraud prevention in banking sector in Kenya.

Study findings shows that communication of information test statistics (t = -0.927, p = 0.354) indicated that the t value falls in non-rejection region and p value is insignificant. Therefore, the null hypothesis was not rejected. It was therefore concluded that compliance with prudential regulations does not moderate relationship between communication of information and fraud prevention in banking sector in Kenya. These

findings implies that if there are legislations and regulations that govern how to communicate in order to prevent fraud, these regulations are not adhered to or the concerned parties may not be well conversant with regulations thus they are not able apply or utilise them properly for the benefit of their organizations.

The last hypothesis on moderation of the relationship between the ICS variables and fraud prevention was stated as:

H_{05}: Compliance with prudential regulations does not moderate relationship between monitoring of activities and fraud prevention in banking sector in Kenya.

H_{a5}: Compliance with prudential regulations moderates relationship between monitoring of activities and fraud prevention in banking sector in Kenya.

The study findings pertaining to monitoring of activities shows a t value of 1.640 which is less than the critical value of 1.694 and p value of 0.101 which is greater than critical value of 0.05 indicating insignificance. It was therefore concluded that compliance with prudential regulations does not moderate relationship between monitoring of activities and fraud prevention in banking sector in Kenya. These findings imply that the regulations governing monitoring of activities are not working properly. It may also indicate that the regulations that second these monitoring parameters may not be considered or are not taken seriously or applied as stipulated by the concerned individuals.

4.10 Overall Multiple Regression Models Analysis on ICS and Fraud Prevention

The study analysed the overall effect of each ICS component on fraud prevention in banking sector in Kenya using ordinary least square equation. Further the moderating effect of compliance with prudential regulations on the relationship between ICS and fraud prevention was analysed using moderated multiple regression equation. Table 4.21 shows the overall models summary results. The results for model show that the ICS has strong relationship with the fraud prevention ($R = 0.741$, $R^2 = 0.549$). The moderating effect of compliance with prudential regulations on the relationship between various

components of ICS and fraud prevention shows that the moderated components explains only 27.9% (R = 0.529 and R^2 = 0.279) of the variability of fraud prevention.

Table 4.21: Model Summary Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.741[a]	.549	.465	.37128	.549	6.572	5	27	.000
2	.529[b]	.279	.146	.92414	.279	2.094	5	27	.097

a. Predictors: (Constant), Monitor, Risk Assessment, Communication, Control Environment, Control Activities

b. Predictors: (Constant), M_G, R_G, C_G, CV_G, CA_G

ANOVA test was used to determine of how well the observed data fit in the model. The null hypothesis was that the model fits. The ANOVA test results on table 4.22 show an F value of 6.572 and p value of 0.000 (P < 0.05) for model 1, it is therefore concluded that the overall ordinary regression model fit significantly. This implies that the coefficients derived can be substituted in the ordinary regression model. The results in table 4.22 further show an F value of 1.788 and p value of 0.097 for model 2 which is more than critical p value of 0.05, therefore the study concludes that the moderated multiple regression model does not fit significantly. This implies that the derived coefficients cannot be substituted in moderated regression model.

Table 4.22: ANOVA Test Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.529	5	.906	6.572	.000[a]
	Residual	3.722	27	.138		
	Total	8.251	32			
2	Regression	8.941	5	1.788	2.094	.097[b]
	Residual	23.059	27	.854		
	Total	32.000	32			

a. Dependent Variable: Fraud Prevention

b. Predictors: (Constant), Monitor, Risk Assessment, Communication, Control Environment, Control Activities

b. Predictors: (Constant), M_G, R_G, C_G, CV_G, CA_G

Results in table 4.23 show regression weights of different components of the ICS and the moderating variable. The t values and p values are also indicated. Ordinary regression model represented by equation 4.1 was used in analysis of the effect of ICS on fraud prevention

OLS equation $\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + Ɛi}$**... Equation 4.1**

The coefficients obtained from test are substituted in ordinary least square model used give model that follow:

Fraud Prevention = 2.017 - 0.048 Control Environment + 0.164 Risk Assessment + 0.328 Control Activities – 0.387 Communications + 0.440 Monitoring..... Equation 4.2

The results indicated in the model indicate that for every unit percentage increase in control environment (X_1) there is 4.8% decrease in fraud prevention (Y), further it was shown that for every unit percentage increase in risk assessment there is 16.4% increase in fraud prevention. The control activities coefficient indicates that for every unit percentage increase in control activities there was 32.8% increase in fraud prevention. Communication shows a negative relationship with fraud prevention. The test results show that for every unit percentage increase in communication there was 38.7% decrease in fraud prevention. Monitoring coefficient shows that for every unit percentage increase in monitoring there was 44% increase in fraud prevention.

Moderated Multi-Regression model used to analyse the moderating effect of compliance with prudential regulations on the relationship between ICS and fraud prevention was represented by equation 4.3:

MMR equation $\mathbf{Y = \beta_0 + \beta_1 X_1 Z + \beta_2 X_2 Z + \beta_3 X_3 Z + \beta_4 X_4 Z + \beta_5 X_5 Z + Ɛ_i}$**…Equation 4.3**

The coefficients obtained from test cannot be substituted in moderated multi-regression model as the ANOVA test shows that the model does not fit significantly ($p = 0.097 > 0.05$).

Table 4.23: Regression Results on ICS and Moderating Effect of Compliance with Prudential Regulations on Relationship between ICS and Fraud Prevention

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.017	1.661		1.215	.235
	Control Environment	-.048	.131	-.052	-.362	.720
	Risk Assessment	.164	.172	.135	.954	.349
	Control Activities	.328	.201	.263	1.632	.114
	Communication	-.387	.162	-.358	-2.395	.024
	Monitor	.440	.196	.333	2.242	.033
2	(Constant)	-.006	.195		-.031	.975
	CV_G	-.567	.254	-.470	-2.228	.034
	R_G	.567	.298	.391	1.899	.068
	CA_G	-.326	.207	-.331	-1.573	.127
	C_G	-.251	.304	-.167	-.828	.415
	M_G	.416	.276	.290	1.507	.144

a. Dependent Variable: Fraud Prevention
b. Dependent Variable: ZF

4.11 Financial Statements Analysis for Income Manipulations

This section represents the findings of audited financial statements analysis for data manipulations using Beneish M-score Model. The financial statement analysis was undertaken to establish the presence of fraud or otherwise in banks in order to supplement the primary data. The audited financial statements used were for all banks registered and operating in Kenya for the periods under analysis are 2016 and 2017 and whose primary data was obtained. The banks were used because their accounts are made public, financial statements are prepared as per guidelines and regulatory framework of international accounting standards and also require public scrutiny. The financial statements used were the latest available and audited accounts. Audited accounts were ideal as the external auditors had verified and agreed that the financial statements showed true and fair view of the status of organizations.

The Beneish M-score model has been fronted as a reliable tool for fraud detection (Talab, Hammood & Ali, 2017). Beneish model has been used to detect manipulation of accounts. The manipulation may be due to management of earnings where the managers use judgement in financial reporting to alter the statements to hoodwink the stakeholders about the financial position of the organization also referred to as creative accounting or accounting fraud where rules and principles of accounting are violated (Paolone & Magazzino, 2014).

The original Beneish model had eight financial rations that included; Days Sales in Receivable Index (DSRI), Gross Margin Index (GMI), Asset Quality Index (AQI), Sales Growth Index (SGI), Depreciation Index (DEPI), Sales, General and Administrative Index (SGAI), Leverage Index (LVGI) and Total Accruals to Total Assets (TATA). Further research on model was carried out and three ratios (SGAI, LVGI and TATA) were found to be insignificant and were dropped from the model (Feruleva & Shtefan, 2017). This study therefore utilised five ratios Beneish model based on the significance of ratios.

4.11.1 Days Sales in Receivables Index

Days Sales in Receivables Index (DSRI) measures the ratio of receivables to the sales of current period as compared to immediate past period. Sales refer to the net revenues earned from selling goods and services. In banks net revenues are deemed to be total net interest income (interest income minus interest expense) and non-interest income (Teimet, Ochieng & Aywa, 2011). Receivables are equivalent to loans and advances in banks. The ratio above one indicates sales to receivables of the current period are higher than that of the previous period. Any large increase may indicate revenue inflation (Talab, Hammood & Ali, 2017). The increase in day sales in receivables may as well indicate change in credit policy, although Beneish stated that it may be due to overstatement of both revenues and profits (Paolone & Magazzino, 2014). DSRI is derived as shown by equation 4.5:

$$\text{DSRI} = \frac{\text{Net Receivables n/Sales n}}{\text{Net Receivables n}-1/\text{Sales n}-1} \quad \text{.....Equation 4.5}$$

The results in appendix VII show the DSRI for various banks. The results show that all banks had increased day's sales in receivables but not large increases. The highest increase in index was 14% and the lowest was 3%, therefore none of the banks were involved in overstatement of profits and revenue as per recommendations by Paolone & Magazzino (2014) who argued that large increases in DSRI is associated with overstated revenues hence overstated profits.

4.11.2 Gross Margin Index

Beneish (1999) indicated that there is positive relationship between the Gross Margin Index (GMI) and prospect of committing fraud (Feruleva & Shtefan, 2017). The cost of sales is equivalent to total operating costs in banks. The GMI of less than one shows negative firm's prospects and it would be incentive to manipulate accounts to conceal the poor performance of the business (Talab, Hammood & Ali, 2017). GMI is derived as follows:

$$\text{GMI} = \frac{\text{Sales n}-1-\text{Cost of Sales n}-1/\text{Sales n}-1}{\text{Sales n}-\text{Cos of Goods n/Sales n}} \quad \textbf{…….. Equation 4.6}$$

The results on appendix VIII show that there were fifteen banks representing 45.5% with GMI of less than 1. Based on the argument by Talab, Hammood and Ali (2017), only the banks with a GMI of less than one had poor performance and would have incentives to manage the earnings to hoodwink the stakeholders on the performance. Other banks have GMI of greater than 1, which indicates the likelihood that the banks have better future prospects and that they have no incentive for earning management.

4.11.3 Asset Quality Index

This ratio compares current assets and property, plant and equipment with the total assets of the firm (Ahmed & Naima, 2016). The current assets in the banks include; cash and cash equivalent securities held for trading purposes, securities held for sale, deposits and balances due from other banking institutions, CBK and other foreign banking institutions tax recoverable and any other asset that can be converted into cash or recoverable within one year. The index of greater than 1 indicates that the firm might be involved in earning management of capitalizing costs or suspending costs recognition (Talab, Hammood & Ali, 2017). The Asset Quality Index (AQI) is measured as follows:

$$\text{AQI} = \frac{1-(\text{Current Asset n}+\text{PPE n})/\text{Total Assets n}}{1-(\text{Current Asset n}-1+\text{P}\quad \text{n}-1)/\text{Total Assets n}-1} \quad \text{..... Equation 4.7}$$

The results presented in appendix IX, show that 14 banks representing 42% of the total banks included in the study had an AQI of more than one, thus there is high possibility they practised earning management as suggested by Talab, Hammood and Ali (2018).

4.11.4 Sales Growth Index

Sales growth in firms does not necessarily indicate manipulation of accounts, however any firm with growth in sales are likely to commit fraud on financial statements due to undue pressure to attain the set profitability targets (Paolone & Magazzino, 2014). Sales Growth Index (SGI) is used to measure the improvement in sales in the current period as compared to the previous period. Any value above one show that the revenue has increased and any value of less than one indicates negative growth of revenue (Talab, Hammood & Ali, 2017). SGI is derived as follows:

$$\text{SGI} = \frac{\text{Sales n}}{\text{Sales n}-1} \quad \text{..... Equation 4.8}$$

The findings in appendix X show that sixteen banks representing 48.5% of the total banks included in the study had SGI of above one, these banks could have been involved in

manipulations of accounts due to pressure put on managers (Paolone & Magazzino, 2014).

4.11.5 Depreciation Index

Depreciation decrease may be due to adjustment of economic life of fixed assets which may be used to show improved profitability in the financial statement. The depreciation index and falsification of profits have positive relationship (Feruleva & Shtefan, 2017). Depreciation Index (DEPI) of more than one, indicates that the firm may have adjusted the economic life of the fixed assets upwards to reduce depreciation or may have changed the depreciation method and used a method that will show low depreciation and therefore report more profits (Talab, Hammood & Ali, 2017). DEPI is computed as follows:

$$\text{DEPI} = \frac{\text{Depreciation n}-1/(\text{Depreciation n}-1+\text{PPE n}-1)}{\text{Depreciation n}/(\text{Depreciation n}+\text{PPE n})} \quad \text{.....Equation 4.9}$$

The results obtained after analysis and presented in appendix XI, show that ten banks representing 30.3% of the bank studied had DEPI of more than one. This means that ten banks may have adjusted the economic life of fixed assets or depreciation method in order to improve profitability as suggested by Talab, Hammood and Ali (2017).

The study utilized a five variables Beneish model due to the significance of the five ratios in determining the financial statement manipulators as suggested by Feruleva and Shtefan (2017). The five variable model is given by equation 4.10:

M Score = -6.065+ .823 DSRI + .906 GMI + .593 AQI + .717 SGI + .107 DEPI

.....Equation 4.10

Based on the model and ratios computed, the M score for each firm was computed and the results presented in appendix XII. Beneish (1999) suggested that any firm that has an m-score of less or equal to -2.76 based on five-variable model was not involved in manipulation of financial statements. However, any m-score of more than -2.76 highly suggests the possibility of earning management (Feruleva & Shtefan, 2017). The results

in table 4.29 show various m-score of various banks. The results show that 21 banks translating to 63.6% of the banks were non-manipulators whereas 12 banks representing 36.4% were indicated as manipulators. The banks were later presented in different tables as likely non-manipulators and likely manipulators based on the results of Beneish model. Tables 4.24 and 4.25 respectively represent likely Non-manipulators and likely manipulators respectively based on Beneish model.

Table 4.24: Non-Manipulators Based on Beneish Model M-Score

Bank	DSRI	GMI	AQI	SGI	DEPI	M-Score
1	1.025	0.997	0.912	1.055	0.932	-2.92117
2	1.359	-0.306	1	0.639	0.809	-4.08605
3	0.949	0.937	0.988	1.222	1.161	-2.84877
4	0.883	0.992	1.038	1.214	0.362	-2.91483
5	1.03	0.997	0.709	0.955	0.814	-3.12176
6	1.28	1.003	0	1.059	0.951	-3.24178
8	1.035	0.558	1	0.888	1.081	-3.36228
9	1.1	1.063	1.066	0.974	0.913	-2.76844
10	1.121	0.97	1.027	1.096	0.77	-2.78636
12	1.085	1.08	1.037	1.002	0.925	-2.76122
14	1.058	0.936	0.919	0.948	0.916	-3.02356
15	1.204	-0.332	1.494	0.72	0.828	-3.88412
16	2.035	-0.17	0.949	0.886	2.058	-3.12599
21	1.046	1.088	0.823	1.048	0.805	-2.89282
22	1.011	0.332	0.766	1.083	1.306	-3.56166
23	1.108	1.083	0.775	0.859	0.691	-3.0225
25	1.035	1.073	0.95	0.983	0.914	-2.8751
27	1.237	-0.067	0.825	0.682	0.845	-4.03902
28	1.708	-3.327	0.846	0.529	1.148	-6.66977
29	1.079	0.401	1.211	0.653	1.162	-3.50302
33	1.062	1.064	0.624	1.161	0.937	-2.92426
Average	1.172	0.433	0.887	0.931	0.973	

The results represented in table 4.24 shows that 21 banks were likely non-manipulators based on Beneish five-variable model. The results in table 4.25 indicate that twelve banks could have been involved in earning management as suggested in the study carried out by Feruleva and Shtefan (2017).

Table 4.25: Manipulators Based on Beneish Model M-Score

Bank	DSRI	GMI	AQI	SGI	DEPI	M-Score
7	0.918	1.139	1.122	1.101	1.079	-2.70734
11	1.269	1.372	0.876	0.83	1	-2.556
13	0.293	4.6	0.923	2.283	1.337	0.671048
17	1.21	2.306	1.095	1.083	0.685	-1.48079
18	1.359	1.046	1.106	0.789	0.708	-2.70154
19	1.114	3.175	0.073	1.075	0.863	-1.36522
20	1.111	1.172	1.077	1.019	0.986	-2.61403
24	1.14	0.96	1.95	0.92	1.11	-2.32226
26	0.966	1.207	1.296	1.021	0.883	-2.58137
30	1.099	1.333	1.186	1.028	0.108	-2.5009
31	1.06	1.301	0.77	0.971	1.161	-2.73687
32	1.159	2.631	2.078	0.895	0.933	-0.75366
Average	1.070	1.655	1.103	1.061	0.911	

4.11.6 Probit Regression Analysis on Financial Statement Manipulation

The study categorised banks as manipulators and non-manipulators. The dependent variable was dichotomous in nature and it was prudent to use probit regression model. Shah and Shanwari (2015) indicated that model with dichotomous dependent variable cannot be analysed using ordinary least square regression as the results will be inappropriate, therefore they advocated for the use of probit regression model. The ratios computed were used for further analysis to determine the non-fraudulent and fraudulent banks using probit regression model. The ratios computed were used for further analysis to determine the non-fraudulent and fraudulent banks using probit regression model. The averages of the ratios for non-manipulators were used as the benchmark values for the analysis to determine fraudulent banks as suggested by (Feruleva & Shtefan, 2017). Probit regression model applied is represented by equation 4.10

$$pr(Y = 1|X) = \phi(X^{n}\beta) \quad \text{..... Equation 4.10}$$

Where 1 represents Manipulator

The averages of non-manipulators based on Beneish model are presented in table 4.26 and were used as benchmark variables in obtaining new m-score to determine non-fraudulent and fraudulent banks among banks operating in Kenya. The benchmark values were applied as per the suggestion of Paolone & Magazzino (2014).

Table 4.26: Benchmark for Variables

Variable	**DSRI**	**GMI**	**AQI**	**SGI**	**DEPI**
Benchmark	1.172	0.433	0.887	0.931	0.973

The probit regression was undertaken using all the ratios computed based on Beneish model. Results of the probit regression model that was used for further analysis to determine the non-fraudulent and fraudulent banks are presented in table 4.27.

4.27: Probit Regression Coefficients

Parameter	B	Std. Error	Hypothesis Test		
			Wald Chi-Square	df	Sig.
(Intercept)	101.394	6.0923	276.988	1	.000
DSRI	40.097	3.0158	176.775	1	.000
GMI	-128.995	2.6037	2454.430	1	.000
AQI	-102.915	2.4494	1765.395	1	.000
SGI	142.541	5.1477	766.734	1	.000
DEPI	-35.359	.8019	1944.136	1	.000
Likelihood Ratio Chi-Square	43.262				
df	5				
Sig	0.000				

Dependent Variable: Manipulator
Model: (Intercept), DSRI, GMI, AQI, SGI, DEPI
a. Fixed at the displayed value.

The results in table 4.27 show a chi-square value of 43.262 and p value of 0.0001 which shows that the model fits well. Further the coefficients of DSRI (40.097), GMI (-

128.995), AQI (-102.915), SGI (142.541) and DEPI (-35.359) are all statistically significant as the p values are less than the critical value of 0.05. The coefficients obtained were substituted into Beneish model to form equation 4.11

Revised M-Score = 101.394+40.097 DSRI - 128.995 GMI - 102.915 AQI + 142.541 SGI - 35.359 DEPI …….... Equation 4.11

The coefficients from probit regression and the averages of non-manipulator used as benchmarks were used to compute the revised m-score to determine non-fraudulent and fraudulent banks. The new m-score was calculated as shown in equation 4.12

Revised M-Score = 101.394+40.097 (1.172) - 128.995 (0.433) - 102.915 (0.887) + 142.541 (0.931) - 35.359 (0.973) = 99.56 ……. Equation 4.12

4.11.7 Financial Statements Manipulation Results

The financial statements analysis based on revised m-score is shown in table 4.28. The code column represents non-fraudulent (0) and fraudulent (1). The results show that 26 banks translating to 78.8% are non-fraudulent and 7 banks translating to 21.2% are fraudulent. Agbenyo, Jiang and Cobblah (2018) stated that if the elements of ICS are working properly, the financial statement of the organization will be qualitative and there will be no fraud. The recording of errors, loss of assets, inefficiencies and wrong decisions can be addressed by strong ICS. Weak ICS therefore, will increase fraud through giving unqualified opinions on defective financial statements (Widyaningsih, 2016). Implementation of internal controls and internal audit will improve the quality of financial reporting, thus reducing chances of fraud (Kewo & Afiah, 2017). The results in table 4.28 indicate that 26 banks were non-fraudulent therefore it was concluded that those banks had strong ICS and are able to eliminate fraud. The remaining 7 banks which were categorised as fraudulent and therefore deemed to have weak ICS and are unable to prevent fraud as suggested by Widyaningsih (2016). These results concur with similar study undertaken by Feruleva and Shtefan (2017) where twenty one percent of the banks included in the study were found to be involved in fraudulent earning management.

Table 4.28: Results on Non-Fraudulent and Fraudulent

Bank	DSRI	GMI	AQI	SGI	DEPI	M-SCORE	Code
1	1.025	0.997	0.912	1.055	0.932	37.45	0
2	1.359	-0.306	1	0.639	0.809	154.92	1
3	0.949	0.937	0.988	1.222	1.161	50.03	0
4	0.883	0.992	1.038	1.214	0.362	62.26	0
5	1.03	0.997	0.709	0.955	0.814	48.46	0
6	1.28	1.003	0	1.059	0.951	140.66	1
7	0.918	1.139	1.122	1.101	1.079	-5.41	0
8	1.035	0.558	1	0.888	1.081	56.35	0
9	1.1	1.063	1.066	0.974	0.913	5.22	0
10	1.121	0.97	1.027	1.096	0.77	44.52	0
11	1.269	1.372	0.876	0.83	1	-31.91	0
12	1.085	1.08	1.037	1.002	0.925	8.98	0
13	0.293	4.6	0.923	2.283	1.337	-297.08	0
14	1.058	0.936	0.919	0.948	0.916	31.24	0
15	1.204	-0.332	1.494	0.72	0.828	112.09	1
16	2.035	-0.17	0.949	0.886	2.058	160.78	1
17	1.21	2.306	1.095	1.083	0.685	-130.09	0
18	1.359	1.046	1.106	0.789	0.708	-5.44	0
19	1.114	3.175	0.073	1.075	0.863	-148.29	0
20	1.111	1.172	1.077	1.019	0.986	-5.69	0
21	1.046	1.088	0.823	1.048	0.805	39.21	0
22	1.011	0.332	0.766	1.083	1.306	128.47	1
23	1.108	1.083	0.775	0.859	0.691	24.37	0
24	1.14	0.96	1.95	0.92	1.11	-85.53	0
25	1.035	1.073	0.95	0.983	0.914	14.51	0
26	0.966	1.207	1.296	1.021	0.883	-34.63	0
27	1.237	-0.067	0.825	0.682	0.845	142.07	1
28	1.708	-3.327	0.846	0.529	1.148	546.79	1
29	1.079	0.401	1.211	0.653	1.162	20.29	0
30	1.099	1.333	1.186	1.028	0.108	-5.83	0
31	1.06	1.301	0.77	0.971	1.161	-5.81	0
32	1.159	2.631	2.078	0.895	0.933	-310.79	0
33	1.062	1.064	0.624	1.161	0.937	74.87	0

NB: The banks names have been omitted in the analysis to safeguard the confidentiality of the banks as promised during data collection and ethical practises in research studies.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary, conclusion and recommendations of research thesis on ICS and fraud prevention in banking sector in Kenya. In this chapter the findings summary of the six research hypotheses and Beneish model are given, the conclusions on the hypotheses testing results and recommendations on policy and further research requirements are also included.

5.2 Summary

This section presents the summary of the findings based on the six research objectives, the results of hypotheses tests and financial statement analysis based on Beneish five-variable model on manipulation of financial statements. The study involved all banks registered and operating in Kenya. Data was collected using structured questionnaires and analysed using SEM and moderated multiple regression models based on the hypotheses. The data from financial statements of all banks registered and operating in Kenya were used for testing financial statement manipulation using Beneish model.

5.2.1 Control Environment and Fraud Prevention

The first objective of the study was to examine the effect of control environment on fraud prevention in banking sector in Kenya. The null hypothesis that control environment has no significant effect on fraud prevention in banking sector in Kenya was derived from the specific objective and tested. The results of hypothesis indicated a t value of 0.104 and p value of 0.917 which is greater than the critical p value of 0.05. The p value from the test was insignificant, therefore the null hypothesis was not rejected and it was concluded that control environment has no significant effect on fraud prevention.

5.2.2 Risk Assessment and Fraud Prevention

The second objective of the study was to assess the effect of risk assessment in prevention of fraud in banking sector in Kenya. It was hypothesized that risk assessment has no significant effect on fraud prevention in banking sector in Kenya. The null hypothesis was tested and the results showed that risk assessment has statistically

significant effect on fraud prevention ($t = 2.326$, $p = 0.020 < 0.05$). Therefore, the null hypothesis was rejected and it was concluded that risk assessment has significant effect on fraud prevention in banking sector in Kenya.

5.2.3 Control Activities and Fraud Prevention

The study also evaluated the effect of control activities in fraud prevention in banking sector in Kenya as the third objective. Based on the third objective it was hypothesized that control activities have no significant effect on fraud prevention in banking sector in Kenya. The null hypothesis was tested and the results indicated that the control activities have no statistically significant effect on fraud prevention in banking sector ($t = 1.498$, $p = 0.134 > 0.05$). Therefore, null hypothesis was not rejected and it is concluded that control activities have no significant effect on fraud prevention in banking sector in Kenya.

5.2.4 Communication of Information and Fraud Prevention

The fourth objective of the study was to determine the effect of communication of information in prevention of fraud in banking sector in Kenya. From this objective a null hypothesis was derived which stated that communication of information has no significant effect on fraud prevention in banking sector in Kenya. The results from the test of null hypothesis ($t = -2.639$, $p = 0.008 < 0.05$) showed that communication of information has statistically significant effect on fraud prevention. Therefore, the null hypothesis was not rejected and it was concluded that communication of information has no significant effect on fraud prevention.

5.2.5 Monitoring of Activities and Fraud Prevention

The fifth objective was to establish the effect of monitoring of activities in fraud prevention in banking sector in Kenya. A null hypothesis was formulated from this objective. The null hypothesis stated that monitoring of activities has no significant effect on fraud prevention in banking sector in Kenya. The hypothesis was tested and the results showed that the monitoring of activities has significant effect on fraud prevention ($t = 2.734$, $p = 0.006 < 0.05$). Based on the results the null hypothesis was rejected and it was concluded that monitoring of activities has significant effect on fraud prevention.

5.2.6 Moderating Effect of Compliance with Prudential Regulations on ICS and Fraud Prevention

The last objective of the study was to establish the moderating effect of compliance with prudential regulations on the relationship between the ICS and fraud prevention in banking sector in Kenya. The null hypothesis for this objective stated that compliance with prudential regulations has no moderating effect on the relation between ICS and fraud prevention in banking sector in Kenya. The hypotheses on various components were tested and it was found that the compliance with prudential regulations had moderating effect on relationships on the relationship between control environment and fraud prevention ($t = -2.490$, $p = 0.013 < 0.05$) and the relationship between risk assessment and fraud prevention ($t = 2.068$, $p = 0.039 < 0.05$). Compliance with prudential regulations had no moderating effect on the relationship between control activities and fraud prevention ($t = -1.713$, $p = 0.087 > 0.05$), communication of information and fraud prevention ($t = -0.927$, $p = 0.354 > 0.05$) and monitoring of controls and fraud prevention ($t = 1.640$, $p = 0.101 > 0.05$). The study further analysed the financial statements using Beneish model and probit regression model to supplement the primary data collected. The analysis was to establish whether the banking institutions manipulated financial statements for favourable earnings reporting and the effect of ICS on fraud. The results showed that seven banks out the total thirty-three banks analysed have been involved in earning management or financial statements manipulation.

5.3 Conclusion

The first study objective was to examine the effect of control environment on fraud prevention in banking sector in Kenya. The parameters used to test this objective included; vetting of employees, chain of command, follow-up on delegated responsibilities, training, promotion and compensation, meeting deadlines, assignment of responsibilities, job description, investigations and punishment of wrongdoers and procedures and policies available in the organization. The descriptive statistics showed that the respondents strongly agreed that the parameters used to measure control environment were effective. This could have been attributed to the fact that the respondents who included branch managers, operations mangers and cash managers or

supervisors who bear huge responsibility to ensure that organization's directives and ethics are maintained in their branches were actually strict and effective in instilling discipline in their branches, or could have provided higher scores not be seen as incompetent in their areas of operations. The hypothesis test results showed that control environment has no significant effect on fraud prevention in banking sector in Kenya. It was therefore concluded that the control environment parameters have no significant effect in fraud prevention in banking sector in Kenya.

The second objective of the study was to assess the effect of risk assessment in prevention of fraud in banking sector in Kenya. The indicators of risk assessment were mechanisms of risk mitigation, proper security for financial documents, mechanisms of identifying potential risks, mechanisms for estimating potential risks, reports for missing supporting documents, response to potential risks, policies for monitoring operations and transactions, financial reporting controls, periodic reconciliations for transactions and review of procedures and policies. The descriptive statistics indicated strong agreement among the respondents that the mechanisms put in place were working well in assessing the risks. This high rating of the risk assessment parameters could be due to proper and strong mechanisms that have been put in place to identify potential risk, analysis, estimation and mitigation of risks. This could also be attributed to the fact that the respondents, who bear the burden to safeguard the shareholders' resources at branch level, would like to assure customers, potential and current investors that their savings and investment are protected against risk in order increase their confidence and attract more customers and investors. The hypothesis test results showed that risk assessment has significant effect on fraud prevention. Based on these findings it was concluded that, as the respondents agreed strongly that the mechanisms put in place are effective in fraud prevention, mechanism put in place to assess the risks have significant effect in fraud prevention and as such they should be enhanced to have positive and significant effect in fraud prevention in banking sector.

The study also evaluated the effect of control activities in fraud prevention in banking sector in Kenya as the third objective. The aspects that were analysed; were regular

reconciliation of transactions, application of proper accounting principles, elaborate segregation of duties, proper verification of supporting documents, regular review of control policies, restriction of access to documents and assets and comparison between budgeted and actual expenditure. The descriptive statistics results showed that the respondents strongly agree that the control activities established by the banks are effective in fraud prevention. This strong agreement may due to proper strong controls that have been established. The ratings could also be due to the responsibilities bestowed upon the respondents, since the respondents bear the burden of safeguarding the assets, they may have introduced proper and strong control mechanisms to protect the resources of their organizations. However, the hypothesis test results indicated that control activities have insignificant effect on fraud prevention in banking sector in Kenya. It is therefore concluded that although there is agreement among the respondents that the mechanisms put in place are capable of preventing fraud, these mechanisms are not fool proof enough to prevent fraud completely and fraudsters find weak points to perpetrate fraud. Therefore, it would be prudent to reinforce these parameters or introduce new and more effective mechanisms.

The fourth objective of the study was to determine the effect of communication of information in prevention of fraud in banking sector in Kenya. The indicators used to measure communication of information were roles of employees in averting fraud, system of capturing and communication of information, Actions taken on information communicated, restriction to accessibility of information, evaluation of information, Proper classification of information, proper policies and procedures and explanation of employees' role in communication. The descriptive statistics indicated that respondents strongly agree that the parameters used to measure communication of information were effective in fraud prevention. These ratings could be attributed to the belief that the mechanisms that have been put in place are strong as per respondents. The respondents may have put in place the latest technology to facilitate faster information transfer, safe means of communication and easier way of passing the information. The hypothesis test results showed that communication of information had statistically significant effect on fraud prevention. It was therefore concluded that the mechanisms that the organizations

have put in place pertaining to communication of information were working properly and had significant effect in fraud prevention in banking sector in Kenya.

The fifth objective was to establish the effect of monitoring of activities in fraud prevention in banking sector in Kenya. Monitoring of activities was measured using mechanisms for evaluation of activities, regular review of the processes, ensuring the employees follow laid down rules, planning of activities to provide evidence, independent review of effectiveness of controls, continuous checks of controls, continuous evaluations of transactions by the supervisors, investigation and rectifications of complaints, following of laid down laws by regulatory authority and management take corrective measures. The hypothesis formulated from the objective was tested and the results indicated that monitoring of activities has significant effect on fraud prevention in banking sector in Kenya. The conclusion of the study was that the monitoring of activities that are undertaken by banks in Kenya was working properly to address the issues of fraud in the sector. The findings may due to strict peer to peer audit that most banks practice to seal all the loopholes that might be used by fraud perpetrators in organizations.

The sixth study objective was to establish the moderating effect of compliance with prudential regulations on the relationship between the ICS and fraud prevention in banking sector in Kenya. The parameters for compliance with prudential regulations used were provision of laws by the government, laws provided by government are effective, penalties provided by the Act are sufficient, mechanisms for lawfully punishing the perpetrators and adherence to the laws provided by the government. The respondents generally agreed that the parameters used in compliance with prudential regulations are effective in fraud prevention in banking sector. The hypotheses on components of ICS were tested and it was found that compliance with prudential regulations has moderating effect on relationships between control environment and fraud prevention and control activities and fraud prevention. It was further found that the compliance with prudential regulations does not have moderating effect on relationships between risk assessment, communication of information and monitoring of controls and fraud prevention in

banking sector in Kenya. It was concluded that the regulations assist in improving the control environment and control activities, though the regulations that have been put in place by the government and other regulatory bodies do not have preventive and punitive effect to prevent fraud in banks in Kenya. Compliance with prudential regulations does not reinforce risk assessments, communication of information and monitoring of controls to improve their effectiveness in fraud prevention in banking sector in Kenya.

Further, financial statements were analysed using Beneish and probit models to determine whether the banks practiced earning management. The results showed seven banks practiced earning management, it was therefore concluded that earning management or financial statement manipulation is rife in some banks and the auditors should focus mainly on the loopholes that are provided by laws while scrutinizing financial statements of organization. The study concluded that the banks that were classified as fraudulent using the revised m-score have weak ICS and therefore are not able to prevent fraud from occurring.

5.4 Contribution to Knowledge

The first study objective was to examine the effect of control environment in fraud prevention in banking sector in Kenya. The test results showed control environment has an insignificant effect on fraud prevention in banks in Kenya. It was therefore concluded that the control environment has insignificant effect in fraud prevention in banking sector in Kenya. This study has proved that though the banks may apply all mechanisms to improve the integrity and morals within the organization, more efforts must be put in place to inculcate these tenets to the employees to improve on fraud prevention.

The second objective of the study was to assess the effect of risk assessment in prevention of fraud in banking sector in Kenya. The hypothesis test results showed that risk assessment has statistically significant effect on fraud prevention in banking sector in Kenya. It was concluded the risk assessment has significant effect on fraud prevention. The findings of the study have shown that, banks have put in place strong risk assessment

mechanisms to safeguard investors' deposits and assets, these mechanisms were found to be effective in prevention of fraud if not to completely eliminate fraud.

The study also evaluated the effect of control activities in fraud prevention in banking sector in Kenya as the third objective. The results indicated that the control activities have no statistically significant effect on fraud prevention in banking sector It was concluded that control activities parameters put in place do not have significant effect on fraud prevention. The findings of the study have shown that, contrary to most people's believes that banks have strong controls to safeguard investors' deposits and assets, these controls are not effective in eliminating fraud. The study findings showed that the banks need to re-evaluate the mechanisms they have established in order to effectively control activities within the bank to improve on fraud prevention.

The fourth objective of the study was to determine the effect of communication of information in prevention of fraud in banking sector in Kenya. The results from the test of null hypothesis showed that communication of information has statistically significant effect on fraud prevention. Based on results it was concluded that the mechanisms that the organizations under study have put in place pertaining to communication of information were working properly. The study has empirically shown that communication of information within banking sector was effective in fraud prevention. These mechanisms should be enhanced to ensure that they work even better in fraud prevention.

The fifth objective was to establish the effect of monitoring of activities in fraud prevention in banking sector in Kenya. The hypothesis was tested and the results showed that the monitoring of activities has significant effect on fraud prevention. The conclusion of the study was that the monitoring of activities undertaken by banks in Kenya were working properly to address the issues of fraud in the sector. The study has empirically proved that the monitoring of activities in banking sector in Kenya work in prevention of fraud.

The last objective of the study was to establish the moderating effect of compliance with prudential regulations on the relationship between the ICS and fraud prevention in banking sector in Kenya. The hypothesis was tested based on each component of ICS and it was found that compliance with prudential regulations has moderating effect on relationships between control environment and fraud prevention and also relationship between control activities and fraud prevention. Further it was found that compliance with prudential regulations does not have moderating effect on the relationship between risk assessment, communication of information and monitoring of activities and fraud prevention in banking sector in Kenya. It was concluded that the regulations that have been put in place by the government and other regulatory bodies pertaining to control environment and risk assessment have some effect on the practices undertaken by banks in hiring of employees, integrity, organization cultures, peer review among other practices under control environment and risk assessment. It was further concluded that compliance with prudential regulations does not have moderating effect on control activities, communication within the organization and monitoring. The laws and regulations do not have preventive and punitive effect to prevent fraud in banks in Kenya. Through this study it was proved that the laws and regulations imposed by government and other regulatory bodies do not work effectively in deterrence of fraudsters in committing crimes in banks and that is why fraud increases in banking sector in Kenya.

5.5 Recommendations

This section provides recommendations on policy practice, policy and further research studies based on conclusions of the study.

5.5.1 Recommendations for Practice

The study findings led to the conclusion that the control environment has insignificant effect on fraud prevention in banking sector, therefore it is recommended that when recruiting employees, thorough background checks should be done on employees to ascertain whether they are right people for the job. These checks should be done through competent body that has resources and capability to do so. Control environment is majorly concerned with the integrity of employees before and after being employed. The banks should improve or come up with enhanced code of conduct to guide the employees

on their required conduct and behaviour. Enhanced code of conduct will ensure that the employees are aware of what they are expected to do and will not use lack of such guideline as defence of their action. It is recommended that banks should reward acts of moral high standards by remunerating the high fliers well, recognizing them or promoting them. Rewarding employees who adhere to moral standards will encourage other employees to strive to do right things and will reduce cases of fraud. The employees who violate the code of conduct should be punished to deter others from doing the same. Punishing the wrongdoers will have a deterrent effect which will discourage others from committing fraud.

Risk assessment has been found to have significant effect on fraud prevention, therefore mechanisms put in place to identify, analyse, estimate and mitigate risks should be tightened and enhanced so that they can completely seal off loopholes both in laws and organization policies. It is recommended that the organizations should engage risk analysts on regular bases. The analysts will pinpoint any sign of fraud early enough for it to be stopped before the actual fraud takes place. The organizations should regularly train employees on the ways that can improve their capabilities in detecting and handling any risk. The training of employees on risk assessment will act as the first line of defence against fraudsters as it will deter them before they commit fraud.

Control activities had insignificant effect on fraud prevention. The organizations should improve on some of control activities such as; unannounced or surprise checks to complement and support internal audit. This will deter employees from engaging in teaming and landing form of fraud as they will not be able to know time for surprise checks to clean their accounts. The employees should be rotated regularly and should be engaged in peer review of other employees' jobs in different departments. This practice will ensure that all employees are well versed with bank's operation and can notice any out of ordinary or fraudulent activity. This will also reduce the chances of employees of fully understanding the system to be able to manipulate it. It is also recommended that the control activities that have put in place to be regularly reviewed to enhance on capabilities of dealing with ever changing fraud techniques and practices. Regular review

of control activities will enable the organization to be able to deal with ever emerging acts of fraud.

Communication of information is also an important part of preventing fraud. In the study it was found that communication of information has significant effect on fraud prevention. It is recommended that the organizations should shorten the channels of communication further to ensure that the information on fraud reaches the appropriate body or personnel on time. The bureaucratic and lengthy deliberations before action is taken should be avoided, though care should be taken before an action to avoid litigations. The study also recommends that the channels of communication should be secured further to protect the whistle blowers from being exposed and risk their lives. The organizations must treat any communication on fraud as truthful so that it can be handled with urgency and importance to reduce time for the fraudsters to commit fraud. Urgency in acting on information pertaining to fraud will ensure that any action recommended is expeditiously taken to ensure the fraud perpetrators do not commit fraud.

The study findings showed that the monitoring of activities had significant effect on fraud prevention. The study recommends that the monitoring activities to be evaluated and revised regularly to improve on capability of addressing sophisticated nature of current fraud perpetration. The organizations should engage well trained and experienced personnel in ensuring that monitoring is done well. Revision and regular evaluations of monitoring activities and engaging competent personnel will ensure that any fraudulent activities or abnormal entries in financial statements are intercepted long before the fraudsters actualize their act.

The findings also showed that the compliance with prudential regulations has insignificant effect on the relationship between control activities, communication of information and monitoring of controls and fraud prevention. It is recommended that the government and other regulatory bodies like CBK to introduce new stringent and punitive fines for both individual and institution that violate prudential regulations pertaining to

internal controls of banks, communication concerning fraud and monitoring in banks. The regulators must introduce an enforcement office manned by professionals whose only task is to ensure that the banks follow these regulations strictly. The government should introduce regular and strict inspection of banks to ensure that the regulations are followed. Inspections will ensure that the government will be able to discover loopholes in the regulations that are used in order to manipulate the financial statements. Punishing the fraud perpetrators will have punitive and deterrent effect that will discourage others from engaging in activities that might lead to fraud.

The analysis of financial statements showed that seven banks engage in fraudulent earning management. This could be due to the loopholes in laws and regulations or due to collision among employees in fraudulent activities. The study recommends that organizations ensure that both internal and external auditor should calculate individual indexes and confirm them before writing a report on financial position of the organization. The professional bodies like Institute of Certified Accounts (ICPAK) and Institute of Internal Auditors (IIA) should provide draft proposition to the legislative organs to prepare regulations that will guide the accountants and auditors on the way to prepare and audit financial statements based on indexes that can pinpoint financial manipulations. The analysis of each index will ensure that any noticeable or significant change on index is investigated as it may signal fraud. This will reduce chances of the organization being defrauded. The management of these banks must enhance and strengthen the ICS to prevent perpetration of fraud. The organizations should frequently review the internal regulations to pinpoint the weak ones as well as enhance staff rotations to reduce chances of collision as new staff at a new post may take long to learn the loopholes and coordinate fraudulent activities,

5.5.2 Recommendations for Policy

The study results indicated that control environment and control activities as components of ICS have insignificant effect on fraud prevention in banking sector in Kenya. This is worrisome as the ICS is meant to ensure that the organization's assets are properly safeguarded against fraudsters and misappropriations even by the people entrusted with

them. The safeguard of these assets is only possible when all components of ICS are present and working properly. The policy makers and implementers should come up with a policy document that will explain in details and specifically how peer reviews and job rotations are to be effected to reduce chances of employees becoming too familiar with the system to be able to manipulate the loopholes that might exist in the system. The policy makers should develop and introduce training manual for employees to enlighten them on the importance of the ICS and ways to improve effectiveness of controls. The policy makers should introduce a policy document that will provide guideline on thorough mechanisms of checking potential employees' background before recruitment. Thorough background checks will lead to recruitment of employees with integrity which will reduce chances of committing fraud. The policy makers should also think of introducing an independent office within the organization that will be mandated to evaluate and review of ICS regularly to ensure that the ICS work properly and mechanisms put in place are able to detect and deter fraudulent activities. The policy makers are also advised to introduce a policy that would require the accountants to present financial statements accompanied with important ratios and explanations so that the auditors may be able to fully understand the financial statements before they form an opinion on state of affairs of the organization.

The research findings also indicated that compliance with prudential regulations has no moderating effect on the relationship between control activities, communication of information and monitoring of controls and fraud prevention. The government should introduce an independent office manned by professional accountants and finance analysts that will be responsible for ensuring that the laws governing accountancy and banking are followed strictly by the banks. The office should not replace the already existing regulatory bodies but should be able to supplement these bodies. The government should also come up with the policy document that will harmonize international accounting standards, local accounting standards, regulations and laws to seal the loopholes that are used by the firms to manage earnings in order to hoodwink or defraud the potential investors and investors.

5.5.3 Recommendations for Methodology

The study applied correlational research design where questionnaires were used for collecting primary data and a schedule for secondary data. Descriptive and inferential statistics were used for analysis of data. Hypothesis testing was undertaken using multiple linear regressions based on structural equation modelling (SEM). The questionnaire and data schedule were used to collect all the required data for this study, however some aspects needed more explanations as most respondents would just tick choices in the questionnaire without offering the reasons. The study therefore recommends that mixed research approach including face to face interview to be included in order to obtain more information for certain sensitive aspects that could not be captured by the questionnaire. The results from interview, descriptive and inferential statistics should be compared, analysed and interpreted to provide adequate conclusion. In this study, results showed that under descriptive statistics the respondents strongly agreed on the parameters given while in inferential statistics the results showed that some components of ICS had insignificant effect on fraud prevention. Therefore, the opinion and explanations of the respondents on such conflicting aspects and other issues that could not be captured in data collection instruments should be sought in order to gain clearer picture of the real situation.

5.6 Suggestions for Further Study

The study was based on only banks and the research findings showed that two components of ICS (control environment and control activities) have no significant effect on fraud prevention in banking sector in Kenya. The study recommends further research on other control and protective mechanisms that can be used in fraud prevention in banking sector. Further research on ICS and fraud prevention should be undertaken in other sectors of the economy to establish their effectiveness. Further, research findings showed that compliance with prudential regulations has no moderating effect on the relationship between control activities, communication of information and monitoring of controls and fraud prevention. It is recommended that research study be carried out to establish the prudential regulations that can be used, ones that need to amended or abolished in order to improve and strengthen the ICS to protect the investors' investments and grow the economy.

REFERENCES

Abdullahi, B., Mansor,N., & Nuhu, N. M. (2015). Fraud Triangle Theory and Fraud Diamond Theory: Understanding the Convergent and Divergent for Future Research**.** *European Journal of Business and Management, 7 (28),* 30-37.

Abiola I., & Oyewole A. T. (2013). Internal Control System on Fraud: Nigeria Experience. *Journal of Accounting and Finance, 13(5),* 137 – 148.

Abiola I., & Oyewole A. T. (2013). Evaluation of the Effect of Monitoring and Control Activities on Fraud Detection in Selected Nigerian Commercial Banks. *Research Journal of Finance and Accounting, 4(6),* 57-63

Adeboye, N. O., Fagoyinbo, I. S., & Olatayo, T. O. (2014). Estimation of the Effect of Multicollinearity on the Standard Error for Regression Coefficients. *IOSR Journal of Mathematics, 10 (4),* 16-20

Adetiloye, K. A., Olokoyo, F. O., & Taiwo, J. N. (2016). Fraud Prevention and Internal Control in the Nigerian Banking System. *International Journal of Economics and Financial Issues, 6(3),* 1172-1179.

Agbenyo W, Jiang Y, Cobblah PK (2018) Assessment of Government Internal Control Systems on Financial Reporting Quality in Ghana: A Case Study of Ghana Revenue Authority. *Business and Economics Journal, 9 (4),* 1-9.

Agresti, A., & Tarantola, C. (2018). Simple ways to interpret effects in modeling ordinal categorical data. *Wiley*, 1–14. https://doi.org/10.1111/stan.12130

Ahmed, T., & Naima, J. (2016). Detection and analysis of probable earnings manipulation by firms in developing country. *Asian Journal of Business and Accounting, 9 (1),* 59-81.

Aliabadi, S., Dorestani, A., & Qadri, M. (2011). Fraud Prevention and Detection in the United States: A Macro Perspective. *Journal of Forensic & Investigative Accounting, 3(3),* 150-165

Akelola, S. (2012). *Fraud in Banking Sector: A Case Study of Kenya* (Doctoral dissertation). Trent University, Nottingham, United Kingdom.

Akelola, S. (2015). Prosecuting Bank Fraud in Kenya: Challenges faced by the Banking Sector. *Journal of Finance and Management in Public Services, 14 (1),* 1-19.

Akwaa-Sekyi, E. K., & Gené, J. M. (2017). Internal controls and credit risk relationship among banks in Europe. *Intangible Capital, 12(1),* 357-389.

Akwaa-Sekyi, E. K., & Gené, J. M. (2016). Effect of internal controls on credit risk among listed Spanish banks. *Intangible Capital, 13(1),* 25-50.

Ali, U., Ormal, L., & Ahmad F. (2018). Impact of Free Cash Flow on Profitability of the Firms in Automobile Sector of Germany. *Journal of Economics and Management Sciences, 1 (1),* 57-67

Ali Z. S. (2013). *Contribution of Internal Control System to the Financial Performance of Financial Institution a Case of People's Bank of Zanzibar Ltd* (Master's thesis). Mzumbe University, Dare salaam, Tanzania.

Amadala, V. (2019, February 18). Revealed: How insiders' loans fraud sunk Chase Bank. *Star Newspaper.* Retrieved from https://www.the-star.co.ke/news/2019/02/18/revealed-how-insiders-loans-fraud-sank-chase-bank_c1896064

Amudo, A., & Inanga, E. L. (2009). Evaluation of Internal Control Systems: *A Case Study from Uganda. International Research Journal of Finance and Economics, 1 (27),* 124-144.

Asiligwa, R. G. (2017). The Effect of Internal Controls on the Financial Performance of Commercial Banks in Kenya. *Journal of Economics and Finance, 8(3),* 92-105.

Ayagre, P., Appiah-Gyamerah, I., & Nartey, J. (2014). The effectiveness of Internal Control Systems of banks. The case of Ghanaian banks. *International Journal of Accounting and Financial Reporting. 4(2),* 377-389.

Badara M. S., and Saidin Z. S. (2013). Impact of an Effective Internal Control System on the Internal Audit Effectiveness on Local Government Level. *Journal for Social and Development Sciences, 4(1),* 16 – 23.

Bangsa, N. I. (2018). The Effect of Internal Control Systems, Accounting Systems on the Quality of Financial Statements Moderated by Organizational Commitments. *Accounting Analysis Journal, 7(2),* 127-134.

Banking Fraud Investigations Department (2011). *Financial crime survey report*. Nairobi. Central Bank of Kenya.

Bell, R. (2019) Dealing with common method variance and bias in business and management research: The impact of basketball coaches' cross-cultural communication competence, Sage Research Methods Cases Part 2. *International Journal of Cross-Cultural Management,* 1-14

Benoot, C., Hannes, K., & Bilsen, J. (2016). The use of purposeful sampling in a qualitative evidence synthesis: A worked example on sexual adjustment to a cancer trajectory. *BMC Medical Research Methodology,* 16 *(21),* 1-12

Bhasin, M. L. (2016). The Fight against Bank Frauds: Current Scenario and Future Challenges. *Ciência e Técnica Vitivinícola, 31(2),* 56-85

Bhasin, M. L. (2015). An Empirical Study of Frauds in the Banks. *European Journal of Business and Social Sciences, 4(7)*, 1-12.

Bolarinwa, O. A. (2015). Principles and Methods of Validity and Reliability Testing of Questionnaires Used in Social and Health Science Researches. *Nigerian Post Graduate Journal, 22(4),* 195-201.

Boone H. N., & Boone D. A. (2012). Analyzing Likert Data. *Journal of Extension, 50(2),* 1-5.

Burton L. J., & Mazerolle, S. M. (2011). Survey Instrument Validity part 1: Principles of Survey Instrument Development and Validation in Athletic Training Education Research. *Athletic Training Education Journal, 6 (1),* 27-35

Campbell S., & Hartcher J. (2010). *Internal Controls for Small Business*. National Office CPA Centre: Melbourne.

Central Bank of Kenya (2017). *Bank Supervision Annual Report 2017*. Nairobi. Author

Chakrabarty, K. C. (2014). Fraud in the banking sector – causes, concerns and cures. *National Conference on Financial Fraud* (pp. 1-13). New Delhi: ASSOCHAM.

Chepkoech, F., & Rotich, G. (2017). Effect of Risk Management Process on Motor Insurance Fraud in Kenya. *International Journal for Social Sciences and Information Technology, 3 (3),* 1934-1951

Chetty, P (2016). Choosing an Appropriate research Philosophy for your Paper. Retrieved from https://www.projectguru.in/publications/choosing-appropriate-research-philosophy/

Commission of Sponsoring Organization (2010). *Integrated Framework for Internal Controls.* London. Author.

Commission of Sponsoring Organization (2013). *Internal Control – Integrated Framework*. Durham. Author.

Cooper, R. D., & Schindler, P., S. (2014). *Business Research Methods (12th Edition).* New York: The McGraw-Hill/Irwin.

Daniel, T. H. M. (2013). Detection Fraud of Financial Statement with Fraud Triangle. Melbourne: Widyatama University.

David, J. K., & Muendo, D. (2018). Effect of Central Bank of Kenya Regulations on the Financial Performance of Microfinance Banks. *The Strategic Journal of Business & Change Management, 5(1),* 584-623

Drost, E. (2011). Validity and Reliability in Social Science Research. *Education Research and Perspectives, 38 (1),* 105-124

Etengu, R. O., & Amony, M. (2016). Internal Control System and Financial Performance in Non-Governmental Organisations in Uganda: A Case Study of International Union for Conservation of Nature. *International Journal of Contemporary Applied Sciences, 3(2),* 328-347.

European Investment Bank (2013). *Banking in sub-Saharan Africa – Challenges and Opportunities*. Luxembourg. Author

Feruleva, N. N., & Shtefan, M., A. (2017). Detecting financial statement fraud: The evidence from Russia. *Journal of Corporate Finance Research, 12 (2),* 32-45

Field, A. P. (2013). Discovering statistics using SPSS: and sex and drugs and rock 'n' roll (4th Edition). London: Sage.

Gamage, C. T., Lock, K. L., & Fernando, A. (2014). Effectiveness of internal control system in state commercial banks in Sri Lanka. *International Journal of Scientific Research and Innovative Technology, 1(5),* 25-44.

Gan, S. O., & Ahmad, S. (2011). Multiple Linear Regression to Forecast Balance of Trade. *Journal of Fundamental Sciences, 7 (2),* 150-155

Gathaiya, R. N. (2017). Analysis of Issues Affecting Collapsed Banks in Kenya From Year 2015 to 2016. *International Journal of Management & Business Studies, 7(3),* 9-16

Gesare, M. R.., Nyagol, M., & Odongo, A., J. (2016). Influence of Internal Control Systems on Fraud Risk Management among Commercial Banks in Kisii Town, Kenya. *Journal of Business and Management, 18(4),* 28-34.

Ghasemi, A., & Zahediasl, S. (2012). Normality tests for Statistical Analysis: Guide for Non-Statisticians. *International Journal of Endocrinology and Metabolism,* 10(2), 486-489.

Garson, D. G. (2012). *Testing Statistical Assumptions*. North Carolina. Statistical Publishing Associates.

Gibson, M. R. (2018). *An Analysis of Fraud Prevention and Detection in Not-For-Profit Organizations in the State Of South Carolina* (Doctoral dissertation). Liberty University, Lynchburg Virginia

Githua, R. M., Musiega, D., Juma, S., & Alala , B. O. (2013) . Challenges Facing Implementation of CRB Regulations in Kenya; Commercial Banks in Kakamega Township. *European Journal of Business and Management 5(12),* 21-30

Hayali A., Dinc Y., Sarili S., Secil A., & Aysel G. (2013). Importance of Internal Control System in Banking Sector: Evidence from Turkey.

Hazzi, O. A., & Maldaon, I. (2015). A Pilot Study: Vital Methodological Issues. *Business: Theory and Practice, 16(1),* 53–62

Higgins, H. N. (2012). Learning Internal Controls from a Fraud Case at Bank of China. *Issues in accounting education, 27(4),* 1171–1192.

Hoffmann, O. I. A., & Birnbrich, C. (2012). The Impact of Fraud Prevention on Bank-customer Relationships: An Empirical Investigation in Retail Banking. *International Journal of Bank Marketing, 30(5),* 390-407

Ifeanyi, D. N., Olagunju, A., & Adeyanju, O. D. (2011). Corporate Governance and Bank Failures in Nigeria. *Research Journal of Finance and Accounting, 2 (2),* 1-18.

Ifeoluwa, M. A. (2017). Impact of Effective Internal Control in the Management of Mother and Child Hospital Akure, Ondo State. *Journal of Finance and Accounting*, 5(1), 61-73

Ijeoma N., & Aronu C. O. (2013). The Impact of Fraud Management on Organizational Survival in Nigeria. *American Journal of Economics, 3(6),* 268-272

Ilter, C. (2014). Misrepresentation of Financial Statements: An Accounting Fraud Case from Turkey. *Journal of Financial Crime, 21(2),* 215-225, https://doi.org/10.1108/JFC-04-2013-0028

Ina, I. B. (2016). An Empirical Investigation of the Human Resources Nexus to Frauds in the Nigerian Banking Sector. *International Journal of Scientific and Research Publications, 6 (6),* 231-247.

International Federation of Accountants (2012). *Evaluating and Improving Internal Controls*. London. Author.

Institute of Internal Auditors (2009). International Professional Practices Framework, published by the IIA.

Iorsue, A. B., Terzungwe, N., & Onipe, Y. A. (2018). Control Environment and Internal Control System Effectiveness of Listed Deposit Money Banks in Nigeria. *Research Journal of Finance and Accounting, 9 (12),* 16-26

Jain, Y., NamrataTiwari, ShripriyaDubey, & Jain, S. (2019). A Comparative Analysis of Various Credit Card Fraud Detection Techniques. *International Journal of Recent Technology and Engineering (IJRTE)*, *7*(5), 402–407.

Kabue, L. N., & Aduda, J. (2017). Effect of Internal Controls on Fraud the Detection and Prevention among Commercial Banks in Kenya. *European Journal of Business and Strategic Management, 2(1),* 52-68.

Kanda, R., & Handa, H. (2018). The Impact of Service Ethics on Organizational Competitiveness in India - A Primary Approach to the Startup and Emerging Service Enterprises. *International Journal of Business Ethics in Developing Economies, 7 (1),* 13-22

Karagiorgos T., Droalas G., & Dimou A. (2013). Effectiveness of Internal Control System in Greek Banking Sector. Retrieved from Http://Drogalas.Gr/Uploads/Publications/Effectiveness of Internal Control System in the Greek Bank Sector.pdf

Kassem, R., & Higson, A. (2012). The New Fraud Triangle Model. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS), 3(3),* 191-195

Kaveri, V. S. (2014). Bank Frauds in India: Emerging Challenges. *Journal of Commerce & Management Thought, 1(1),* 14-26.

Kewo, C. L., & Nur, N. (2017). Does Quality of Financial Statement Affected by Internal Control System and Internal Audit? *International Journal of Economics and Financial Issues, 7(2),* 568-573.

Khalaf, G., & Iguernane, M. (2016). Multicollinearity and a Ridge Parameter Estimation Approach. *Journal of Modern Applied Statistical Methods, 15 (2),* 400-410

Kimani E. M. (2015). *Effect of Government Regulations on Factors Hindering Financing of Small-scale Water Investments in Kenya* (Doctoral dissertation). Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya

Kimani, J. (2011). *Fraud Risk Assessment Plan for Barclays Bank of Kenya* (Bachelor's thesis). Tampere University of Applied Sciences, Pirkanmaa, Finland.

Kinyua, K. J. (2016). *Effect of Internal Control Systems on Financial Performance of Companies Quoted in the Nairobi Securities Exchange* (Doctoral dissertation). Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya.

Kiprono, G. J., & Ng'ang'a, P. (2018). Fraud management practices and financial performance of Kenya Ports Authority. *International Academic Journal of Economics and Finance, 3(2),* 241-264

Kodongo, O. (2018) Financial Regulations, Financial Literacy, and Financial Inclusion: Insights from Kenya. *Emerging Markets Finance and Trade, 54 (12)*, 2851-2873, DOI: 10.1080/1540496X.2017.1418318

Koech, J. C. and Kimani E. M. (2018). Effect of Control Environment on Fraud Detection and Prevention at University of Eldoret, Kenya. *Africa International Journal of Management Education and Governance (AIJMEG), 3 (2),* 43-51.

Kristo E. (2011). *Being Aware of the Fraud Risk*. Athens. Bank of Greece.

Kumar, S. P., & Choudary, A. S. (2019). An Innovative Model-Based Approach for Credit Card Fraud Detection Using Predictive Analysis and Logical Regression. *International Journal of Innovative Technology and Exploring Engineering*, *8*(7), 1683–1688.

Kumuthinidevi, S. (2016). A Study on Effectiveness of the Internal Control System in the Private Banks of Trincomalee. *International Journal of Scientific and Research Publications, 6(6),* 600-612.

Kyalo, S. M., Kalio, A, M., & Ngahu, S. (2014). Role of Fraud Prevention in Enhancing Effective Financial Reporting in County Governments in Kenya: Case of Nakuru County, Kenya. *International Journal of Science and Research, 3(10),* 2108-2114

Mathew S. (2011). *Internal Control Guide*. New Jersey. Office of State Controller.

Momanyi, D. K. (2018). *Influence of Financial Regulation in Kenya on Financial Inclusion: A Case Study of the Banking Industry in Kenya*. Nairobi, Kenya. Kenya Bankers Association

Mpaata, K. A., Lubogoyi, B., &Okiria, J. C. (2017). The Effect of Administrative C ontrols on Fraud Detection and Prevention in Barclays Bank Uganda. *International Journal of Science and Research, 6(2),* 1079-1082

Mukanda, F. (2011, January 13). Sh500m lost to Kenya bank fraud in just a month. *Daily Nation*. Retrieved on 3rd May, 2017 from http://www.nation.co.ke.

Mwichigi, G. N., & Atheru, G. (2019). Internal Controls and Credit Risk in Commercial Banks Listed at Nairobi Securities Exchange, Kenya. *International Journal of Finance and Accounting, 4 (1),* 56-74

Mwithi, J. M., & Kamau, J. N. (2015). Strategies adopted by commercial banks in Kenya to combat fraud: a survey of selected commercial banks in Kenya. *International Journal of Current Business and Social Sciences, 1(3),* 1-18.

Ndege J. O., Odhiambo, A., & Byaruhanga, J. (2015). Effect of Internal Control on Fraud Detection and Prevention in District Treasuries of Kakamega County. *International Journal of Business and Management Invention, 4(1),* 47-57.

Nganga, J. K. (2014). *Influence of contextual and cognitive factors on the relationship between performance contracting system and organizational performance in government ministries in Kenya* (Doctoral dissertation). University of Nairobi, Nairobi, Kenya

Njenga, N. M., & Osiema, (2013). Effects of Fraud Risk Management on Organization Performance. *International Journal of Science and Entrepreneurship, 1(7)*, 1 – 17.

Nulty, D. D. (2008). The adequacy of response rates to online and paper surveys: what can be done? *Assessment & Evaluation in Higher Education, 33(3),* 301-314.

Nwofia, J. E. (2018). Contracting Out Services in the Nigerian Local Government: Implications for Internal Revenue Generation. *International Journal of Social Science Studies, 6*(7), 71-83.

Odi, N. (2013). Implications of Fraud on Commercial Banks Performance in Nigeria. *International Journal of Business and Management, 8(15),* 144-150.

Ogola, J. O., K'Aol, G., & Linge, T. (2016). The Effect of Corporate Governance on Occurrence of Fraud in Commercial Banks in Kenya. The International Journal of Business & Management, 4(7), 135-152.

Okonkwo, I. V., & Linda, E. N. (2016). Internal Control Techniques and Fraud Mitigation in Nigerian Banks. *Journal of Economics and Finance, 7 (5),* 37-46.

Oresi, S, N. (2013). Research Methods. Nairobi: Rozoma General Enterprise.

Oribu, K. M., Atambo, W. N., & Mogwambo, V., A. (2016). Effects Implementation of the Central Bank of Kenya Prudential Guidelines on Profitability of Commercial Banks in Kenya: A Survey of Commercial Banks in Kisii County. *International Journal of Social Sciences and Information Technology, 2(3),* 296-318

Osebe, R. P., & Chepkemoi, P. (2016). Corporate Governance and Banking Sector in Kenya. *International Journal of Economics, Commerce and Management, 4(9),* 493-511

Osoro, A., Muturi W. M., & Ngugi, P. K. (2015). Econometric Data Analysis Affecting Performance of Supply Chain Systems in the Petroleum Industries in Kenya the International *Journal of Business & Management, 3 (9),* 98-114

Othmana, R., Arisb, N. A., Mardziyaha, A., Zainanb, N., & Aminb, N. M. (2015). *Fraud Detection and Prevention Methods in the Malaysian Public Sector: Accountants' and Internal Auditors' Perceptions.* 7th International Conference on Financial Criminology 2015, Wadham College, Oxford, United Kingdom

Owusu-Boateng, W., Amofa, R., & Owusu, I. O. (2017). The Internal Control Systems of GN Bank- Ghana. *British Journal of Economics, Management & Trade 17(1),* 1-17.

Palaniappan G. (2017). Determinants of corporate financial performance relating to board characteristics of corporate governance in Indian manufacturing sector: An empirical study. *European Journal of Management and Business Economics, 26(1),* 67-85.

Paolone, F., & Magazzino, C. (2014). Earnings manipulation among main Industrial sectors. Evidence from Italy. *Economia Aziendale, 5 (4),* 253-261

Panda, R. & Leepsa, N. M. (2017). Agency theory: Review of Theory and Evidence on Problems and Perspectives. *Indian Journal of Corporate Governance, 10(1),* 74–95

Peltier-Rivest, D., & Lanoue, N. (2015). Cutting Fraud Losses in Canadian Organizations. *Journal of Financial Crime, 22 (3),* 295-304, https://doi.org/10.1108/JFC-11-2013-0064

Perantalu, V., & Bhargavkiran, K. (2017). Credit card Fraud Detection using Predictive Modeling : a Review. *Iinternational Journal of Innovative Research in Technology*, *3*(9), 53–58.

Price water House Coopers (2018). *2018 Global Economic Crime and Fraud Survey: Uganda Report.* Kampala. Author

Price water House Coopers (2018). *Fraud: The overlooked competitor, 2018 Global Economic Crime and Fraud Survey Kenya Report.* Nairobi. Author

Price Waterhouse Coopers (2016). *2016 Global Economic Crime Survey: Kenya Report.* Nairobi. Author.

Price water House Coopers (2012). *The Internal Control System: A rapidly Changing Management Instrument*. London. Author

Queirós, A., Faria, D., & Almeid, F. (2017). Strengths and Limitations of Qualitative and Quantitative Research Methods. *European Journal of Education Studies, 3 (9),* 369-387

Rafindadi, A. A., & Olanrewaju, Z., A. (2019). Internal Control System, Sustainable Management and Service Delivery of Non-Governmental Organization's in Nigeria: An Empirical Analysis. *International Review of Management and Marketing, 9(2),* 89-103.

Rahi, S. (2017). Research Design and Methods: A Systematic Review of Research Paradigms, Sampling Issues and Instruments Development. *International Journal of Economics & Management Sciences, 6 (2),* 1-5

Razali, N. M., & Wah, Y. B. (2011). Power comparisons of Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors and Anderson-Darling tests. *Journal of Statistical Modeling and Analytics, 2(1)*, 21-33.

Ruankaew T. (2013). The Fraud Factors. *International Journal of Management and Administrative Sciences, 2(2),* 1 – 5.

Samuels, P. (2010). Advice on Exploratory Factor Analysis. *Research Gate*, 1-8

Sanusia, Z. M., Rameli, M. F., & Isa, Y. M. (2015). *Fraud Schemes in the Banking Institutions: Prevention Measures to Avoid Severe Financial Loss.* Proceedings of 7th International Conference on Financial Criminology (pp. 107 – 113). Wadham College, Oxford, United Kingdom

Sarstedt, M., & Mooi, E. (2019). *A Concise Guide to Market Research*. Verlag GmbH. Springer.

Saunders, M., Lewis, P., & Thornhill, A. (2009). Understanding research philosophies and approaches. *Research Gate*, 122-161

Sebopetji, T.O. & Belete, A. (2009). An Application of Probit Analysis to Factors Affecting Small-scale Farmers' Decision to Take Credit: A Case Study of the Greater Letaba Local Municipality in South Africa. *African Journal of Agricultural Research, 4 (8),* 718-723

Shah, A. M. S., & Shanwari, I. (2015). Detecting Earning Management: Deferred Taxes vs Accruals: A Pakistani Perspective. *Journal of Accounting and Finance in Emerging Economies, 1(2),* 111-134.

Sharma, R. B., & Senan N. A. (2019). A Study on Effectiveness of Internal Control System in Selected Banks in Saudi Arabia. *Asian Journal of Managerial Science, 8 (1),* 41-47

Sharma, N., & Sharma, D. (2017). An Empirical Study on Banking Frauds in India- with a special reference to role of employee awareness in banking frauds. *International Journal of Business Management, 3(1),* 2055-2066.

Shopati, A. K., Mitonga, K. H. & Aipinge, L. P. (2018). Healthcare Service Quality Measurement Towards Successful Implementation of Intervention Strategies in Three Namibian Public Healthcares Facilities: a Deterministic Framework. *International Journal of Community Medicine and Public Health, 5 (2),* 511-519

Shukur, H. A., & Kurnaz, S. (2019). Credit Card Fraud Detection using Machine Learning Methodology. *International Journal of Computer Science and Mobile Computing*, *8*(3), 257–260.

Sullivan G. M., & Artino, A. R. (2013). Analyzing and interpreting data from Likert-type Scales. *Journal of Graduate Medical Education.* 541-542

Taherdoost, H., Sahibuddin,, S. & Jalaliyoon, N. (2014). Exploratory Factor Analysis; Concepts and Theory. *Advances in Applied and Pure Mathematics,* 375-382

Talab, H., Hammood, H., & Ali, S., I. (2017). Role of Beneish m-score model in detecting of earnings management practices: Empirical study in listed banks of Iraqi stock exchange. *Research Gate, 15 (23),* 287-302.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 1(2),* 53-55.

Teimet, P. R., Ochieng, D. O., & Aywa, S.(2011). Income Source Diversification and Financial Performance of Commercial Banks in Kenya. *International Journal of Business and Public Management, 1(1):* 26-35

Thao, N. P. (2018). Effectiveness of the Internal Control System in the Private Joint-Stock Commercial Banks in Thai Nguyen Province, Vietnam. Proceedings of 5th IBSM International Conference on Business, Management and Accounting (pp. 766-780). Hanoi University of Sector, Vietnam.

Tong, Y., Wang, M., & Xu, F (2014). Internal control, related party transactions and corporate value of enterprises directly controlled by Chinese central government. *Journal of Chinese Management, 1 (1),* 1-14

Tunji, S. (2013). Effective Internal Control System as an Antidote for Distress in Banking Sector in Nigeria. *Journal of Economics and International Business Research. 1(5),* 1-15.

Uzuno, M. & Akcay, Y. (2012). A Case Study of Probit Model Analysis of Factors Affecting Consumption of Packed and Unpacked Milk in Turkey. *Economics Research International, (2012),* 1-8

Wahab, S. A., Rose, R. C., & Osman, S. I. (2011). Investigating the Moderating Effects of Size of MNCs in the Relationship between Relationship Characteristics and Degree of Inter-Firm Technology Transfer. *Journal of Sustainable Development, 4(4),* 190-201.

Wangombe, J. K., Kiragu, D., & Kamau, R. (2019). Fraud Risk Prevention Strategies and Fraud Occurrence in Large And Medium Sized Commercial Banks In Kenya. *International Journal of Economics, Commerce and Management, 7(6),* 516-531

Watkins M. W. (2018). Exploratory Factor Analysis: A Guide to Best Practice. *Journal of Black Psychology*, *44(3),* 219 –246.

Widyaningsih, A. (2016). Internal Control System on the Quality of Financial Statement Information and Financial Accountability in Primary Schools in Bandung, Indonesia. *Research Journal of Finance and Accounting, 7 (10),* 10-16

Wilhelm K. (2004). The Fraud Management Lifecycle: A Holistic Approach of Fraud Management. *Journal of Economics and Crime Management, 2(2),* 1-38.

Williams, B., Onsman, A., & Brown, B. (2010). Exploratory factor analysis: A five-step guide for novices. *Journal of Emergency Primary Health Care, 8 (3),* 1-13

Williams, M. N., Grajales, C. A., & Kurkiewicz, D. (2013). Assumptions of Multiple Regression: Correcting Two Misconceptions. *Practical Assessment, Research & Evaluation,* 18(11), 1-14.

Wolfe, D.T., & Hermanson, D.R. (2004). 'The Fraud Diamond: Considering the Four Elements of Fraud, *CPA Journal, 74(12),* 34-42.

Yong, A. G., & Pearce, S. (2013). A Beginner's Guide to Factor Analysis: Focusing on Exploratory Factor Analysis. *Tutorials in Quantitative Methods for Psychology, 9(2),* 79-94

Žukauskas, P., Vveinhardt, J., & Andriukaitienė, R. (2018). *Management Culture and Corporate Social Responsibility*. London, United Kingdom. ItechOpen Limited

APPENDICES

Appendix I: Data Collection Instruments

Questionnaire for Branch managers, Operations managers and Cash Managers\Supervisors

Instructions

a) Please read each question carefully before answering it.

b) These questions are meant for study purposes only. Your co-operation will be highly appreciated.

c) Choose the answer that best describes what you believe and feel to be correct.

d) On the questionnaire, locate the square that corresponds to your answer and fill in it.

Section A: Background Information

1) The position held in the bank

Branch manager ☐

Operations Manager ☐

Cash Supervisor ☐

2) Job experiencebelow 5 years ☐

5 – 10 years ☐

10 – 15 years` ☐

15 – 20 years ☐

Above 20 years ☐

3) The bank has established internal controls

Yes [ ] No [ ] I don't know [ ]

4) In your own opinion do the controls put in place necessary

Very Necessary [ ] Moderate [ ] Not necessary [ ]

Section B: Control Environment

Please rank the following statements using the Likert scale provided below starting from strongly disagree to strongly agree. Use the guide below:

1 = strongly disagree 2 = disagree 3 = indifferent

4 = agree 5 = strongly agree

Statements					
Control environment	**1**	**2**	**3**	**4**	**5**
Employees are recruited after thorough vetting on competencies and integrity to avert cases of fraud					
The organization's structure reflects the chain of command which makes it easy to report any suspicious dealings or events					
There is proper follow-up on delegated responsibilities to reduce the cases of misappropriation of assets or misuse of authority					
Employees are regularly trained and new employees properly inducted to ensure that there are minimal or no errors or fraudulent activities are committed					
There are proper mechanism of promoting and compensating the deserving employees to reduce motivation to commit fraud					
The employees meet the set deadline to ensure that the time allowed will be only enough for the work required rather making unnecessary adjustment that may lead to fraud					
Responsibilities and authority in the organization are assigned based on qualifications and competences					
Job descriptions are clearly spelt out and each employee adhere to the description to avoid exceeding the mandate that may lead to fraud					
The organization has proper mechanisms of investigating and punishing the wrongdoers in a transparent and fair manner					
The organization has elaborate procedures and policies that are available to all employees					

What is your opinion of staff policies put in place by your organization in fraud prevention……
……
……
……
……?

Section C: Risk Assessment

Please rank the following statements using the Likert scale provided below starting from strongly disagree to strongly agree. Use the guide below:

1 = strongly disagree 2 = disagree 3 = indifferent

4 = agree 5 = strongly agree

Statements					
Risk Assessment	**1**	**2**	**3**	**4**	**5**
The organization has proper mechanisms for mitigating critical operating risks that may lead to losses					
Financial documents are properly secured against any unauthorised access to reduce manipulations					
The organization has established mechanisms of identifying potential risks.					
The organization has put in place mechanisms of estimating potential risk					
There are no reports of missing supporting documents to authenticate a transaction.					
The organization responds to prospective risk in an appropriate manner.					
The organization has proper policies of monitoring operations and transactions that may reduce chances of risk					
The organization has provided strict financial reporting controls to prevent misstatement or errors in financial statements					
Reconciliations are done periodically to ensure that the physical assets are in agreement with the recorded ones					
The organization reviews its procedures and policies to cope with sophistication of new technology that would increase fraud risk					

What is your opinion on the risk assessment mechanisms effectiveness in prevention of fraud……
……
……
……?

Section D: Control activities

Please rank the following statements using the Likert scale provided below starting from strongly disagree to strongly agree. Use the guide below:

1 = strongly disagree 2 = disagree 3 = indifferent

4 = agree 5 = strongly agree

Statements					
Control Activities	**1**	**2**	**3**	**4**	**5**
Transactions undertaken are properly authorized by competent personnel to avoid cases of fraud					
Reconciliations are carried out regularly and in case discrepancies properly explanation with support of documents is given to rule out misappropriation					
Proper accounting principles are applied employees adhere to the laid down rules and regulations to reduce cases of errors and fraud					
There is elaborate segregation of duties to avoid confusion and increase accountability					
Job rotation is practiced and employees take leave at appropriate time to ensure that the employees do not take advantage of loopholes that might exist in their area of work					
Before any transaction is completed there is proper verification of supporting documents to reduce chances of forgery or fraud					
The organization reviews control policies that have been in place to ensure relevance and effectiveness					
Access to various documents and assets are restricted to only authorized personnel only					
Performance of various employees is reviewed regularly and any noticeable discrepancies are addressed appropriately.					
Budgeted and actual expenditure are compared regularly and any differences explained through support documents					

From your experience how can the control activities be enhanced to improve fraud prevention?

……
……
……
……

Section E: Communication of information

Please rank the following statements using the Likert scale provided below starting from strongly disagree to strongly agree. Use the guide below:

1 = strongly disagree 2 = disagree 3 = indifferent

4 = agree 5 = strongly agree

Statements					
Communication of information	**1**	**2**	**3**	**4**	**5**
The organization has developed easier, quicker and safe means of passing information concerning suspicious or fraudulent activities					
The employees are well informed about their roles in averting fraud					
The organization has proper system to capture and communicate financial transactions and produce financial statements as opposed to manual financial statement preparations which are prone to manipulation and errors					
The information that is communicated is acted upon quickly to avert any acts of fraud					
The external parties contracted to verify financial statements e.g. external auditors are provided with complete and accurate information on timely basis to enable them to scrutinize the statements in order to give objective opinion to help in averting fraud in future					
The information system is only accessible to the authorized personnel to reduce the chances of manipulation by the fraudsters					
Information is evaluated for appropriateness, accuracy, relevance and timeliness before being processed.					
Proper classification of various assets and liabilities are done properly in financial statements to avoid fraudulent entries					
The organization has proper policies and procedures that facilitate receipt of information from external sources pertaining to potential risk or fraud					
The organization has explained the role and importance of dissemination of information to each employee to avoid risk or fraud					

In your assessment how effective are measures put in place to capture and disseminate information……
……
……
……

Section F: Monitoring of activities

Please rank the following statements using the Likert scale provided below starting from strongly disagree to strongly agree. Use the guide below:

1 = strongly disagree 2 = disagree 3 = indifferent

4 = agree 5 = strongly agree

Statements					
Monitoring	**1**	**2**	**3**	**4**	**5**
The organization has evaluation mechanisms to ensure that there are no fraudulent activities					
The organization reviews the process regularly and address discrepancies in the process to reduce chances of fraudulent activities					
The organization has means of ensuring that employees' follow the laid down rules and where any is not followed appropriate action is taken to deter any fraudulent activity					
The organization plan activities in a way that they will provide evidence to base conclusion on the adequacy of the laid mechanisms to deter fraud					
The organization engages independent persons to evaluate and report on the effectiveness of controls to ensure that the controls are able to reduce chances of fraud					
The organization has continuous checks to ensure that the controls are working to deter fraudulent activities before being committed					
Supervisors continuously evaluate transactions for accuracy and completeness before approval					
Any complaints by customers and other stakeholders are investigated and rectified quickly					
The organization follows the laid down laws from the regulatory authority in its undertaking					
The management takes corrective measures any time an independent person pinpoints discrepancy in the controls that has been put in place.					

In your opinion do you think the monitoring activities established can be used to prevent fraud perpetration

……
……
……
……

Section G: Compliance with Prudential Regulations

Please rank the following statements using the Likert scale provided below starting from strongly disagree to strongly agree. Use the guide below:

1 = strongly disagree 2 = disagree 3 = indifferent

4 = agree 5 = strongly agree

Statements					
Compliance with Prudential Regulations	**1**	**2**	**3**	**4**	**5**
The government has provided regulations that the banks use to safeguard proper governance to safeguard money and other assets from fraudsters					
The regulations provided by the government have sound and effective in reducing cases of fraud					
Penalties provided by anti-money laundering Act is sufficient enough to deter fraud commitment					
The government has provided better and easy mechanisms of lawfully punishing fraudsters and reparation of customers in case of fraud					
The bank dutifully adheres to the regulations provided by the government to ensure fraudulent activities are eliminated or reduced.					

In your opinion is there need to enhance regulatory laws by the government and CBK? (specify)……
……
……
……

Section H: Fraud Prevention

Please rank the following statements using the Likert scale provided below starting from strongly disagree to strongly agree. Use the guide below:

1 = strongly disagree 2 = disagree 3 = indifferent

4 = agree 5 = strongly agree

Statements					
Fraud Prevention	**1**	**2**	**3**	**4**	**5**
The structures established provides code of conduct and training on ethics by the organization to ensure that perpetration of fraud is controlled					
The management have put proper mechanisms to identify, measure analyse and record risks so that as to reduce chances of fraud commission					
The laid down policies, procedures and practices are observed properly to reduce cases of fraud in the organization through whistle blowing and internal checks					
The information access is limited and anti-fraud policies communicated on time to avert any attempt to commit fraud in the organization.					
The organization carries out regular evaluation and assessment of various policies and procedures in the organization to ensure that they are able to completely ensure accountability of officers and accuracy of statements to reduce fraud chances.					

THANK YOU

Appendix II: Secondary Data Collection Schedule

Variable	**2017**	**2016**
Sales (Interest income + Non-interest Income- Interest expenses)		
Cost of Goods (Total Operating Expenses)		
Net Receivables (Loans - Provision for loan Loss)		
Current Assets		
Property, Plant and Equipment		
Depreciation		
Total Assets		

Appendix III: Banks Registered in Kenya

1) African Banking Corporation Limited
2) Bank of Africa Kenya Limited
3) Bank of Baroda (K) Limited
4) Bank of India
5) Barclays Bank of Kenya Limited
6) Charterhouse Bank Limited**
7) Chase Bank (K) Limited*
8) Citibank N.A Kenya
9) Commercial Bank of Africa Limited
10) Consolidated Bank of Kenya Limited
11) Co-operative Bank of Kenya Limited
12) Credit Bank Limited
13) Development Bank of Kenya Limited
14) Diamond Trust Bank Kenya Limited
15) Ecobank Kenya Limited
16) Equity Bank (Kenya) Limited
17) Family Bank Limited
18) Fidelity Commercial Bank Limited (SMB Bank)
19) First Community Bank Limited
20) Giro Commercial Bank Limited
21) Guaranty Trust Bank (K) Limited
22) Guardian Bank Limited
23) Gulf African Bank Limited
24) Habib Bank A.G Zurich
25) Habib Bank Limited
26) I & M Bank Limited
27) Imperial Bank Limited*
28) Jamii Bora Bank Limited
29) KCB Bank Kenya Limited
30) Middle East Bank (K) Limited
31) M-Oriental Bank Limited
32) National Bank of Kenya Limited
33) NIC Bank Limited
34) Paramount Bank Limited
35) Prime Bank Limited
36) Sidian Bank Limited
37) Spire Bank Limited
38) Stanbic Bank (Kenya) Limited
39) Standard Chartered Bank Kenya Limited
40) Transnational Bank Limited
41) UBA Kenya Bank Limited
42) Victoria Commercial Bank Limited

NB Banks marked with Stars (*) are excluded

Source: Central Bank of Kenya

Appendix IV: Operationalization and Measurement

Variable	Type of Variable	Operationalization	Measurement	Scale
Control environment	Independent	• recruitment through vetting • chain of command in organizational structure • follow-up in delegated responsibilities • regular training of • proper mechanisms for compensation	A composite index based on the responses was computed and applied in measurement of variables.	Interval
Risk assessment	Independent	• proper mechanisms for mitigating risk have been put in place • whether financial documents are properly safeguarded • Identification and estimation risks • supporting documents for every transaction is provided	A composite index based on the responses was computed and applied in measurement of variables	Interval
Control activities	Independent	• authorization and reconciliation of transactions, • follow up on tasks assigned • verification of transactions • accounting principles are applied • segregation of duties	A composite index based on the responses was computed and applied in measurement of variables	Interval
Communication of information	Independent	• means of passing information • roles of employees in communication	A composite index based on the responses was computed	Interval

		• system of capturing information • Verification of information communicated • how management responds to information	and applied in measurement of variables	
Monitoring of activities	Independent	• evaluation of mechanism • follow laid down rules • planning of activities • engage independent person to evaluate the controls • continuous checks on controls to ensure proper operation	A composite index based on the responses was computed and applied in measurement of variables	Interval
Fraud prevention	Dependent	• Training on ethics and code of conduct • Maintenance of risk registers • Whistle blower policies for controls and Internal checks • Communication on anti-fraud policy and restriction to data access • Continuous evaluations of policies	A composite index based on the responses was computed and applied in measurement of variables	Interval
Compliance with prudential regulations	Moderating	• Improved Corporate governance • Improved customer deposit protection • Safety and soundness of regulations	A composite index based on the responses was computed and applied in measurement of variables	Interval

Appendix V: Summary of the Research Gaps

Author	Focus of the study	Methodology used	Findings	Knowledge Gap	Focus of the Current Study
Agbenyo W, Jiang Y, Cobblah P. K. (2018)	Assessment of Government Internal Control Systems on Financial Reporting Quality in Ghana: A Case Study of Ghana Revenue Authority	Descriptive research	Control Environment, Risk assessment, Control activities, Accounting, communication of information and monitoring have mixed results on influence of ICS on financial reporting quality	The study focused on Assessment of Government ICS on Financial Reporting Quality in Ghana: A Case Study of Ghana Revenue Authority	The study focused on the ICS and fraud prevention in all banks in Kenya
Thao, N. P. (2018).	Effectiveness of the ICS in the Private Joint Stock Commercial Banks in Thai Nguyen Province			The study focused on the effectiveness of ICS in private joint stock banks only in Vietnam	The study focused on the ICS and fraud prevention in all banks in Kenya
Kumuthinidevi, S. (2016)	A Study on Effectiveness of the ICS in the Private Banks of Trincomalee	Exploratory research design	Control Environment, Risk assessment, Control activities, Accounting, communication	The study focused on the effectiveness of ICS in private banks only	The study focused on the ICS and fraud prevention in all banks in Kenya

			of information and monitoring are moderately supportive in the effectiveness of ICS		
Gesare, M., R., Nyagol, M. & Odongo, A., J. (2016).	Influence of ICS on Fraud Risk Management among Commercial Banks in Kisii Town, Kenya	Correlational research design	Control environment and Risk assessment have significant positive influence on fraud risk management in banks.	The study assessed the influence of ICS on fraud management based on two components of ICS	The study involved all the five components of ICS in determining the influence of ICS in fraud prevention
Okonkwo, I. V. & Linda, E. N. (2016).	Internal Control Techniques and Fraud Mitigation in Nigerian Banks	Survey method	The internal control techniques have not been very effective in mitigating frauds in banks	The study focused only on Internal control techniques in mitigation of fraud	The study focused on the influence of ICS in prevention of fraud based on all the components of ICS
Akwaa-Sekyi, E. K., & Gené, J. M. (2016).	Internal controls and credit risk relationship among banks in Europe	Quantitative approach	There are effective internal control systems among banks in Europe	The study was based on banks situated in Europe.	The study focused on banks situated in Kenya
Etengu, R. O. & Amony, M. (2016).	I C S and Financial Performance in Non-	Survey design	Control environment, control activities and	The study was carried out in Uganda and focused on	The study focused on ICS and fraud

	Governmental Organisations in Uganda: A Case Study of International Union for Conservation of Nature		monitoring significantly affect financial performance.	financial performance of Non-governmental organizations.	preventions in banking sector in Kenya
Owusu-Boateng, W., Amofa, R., & Owusu, I. O. (2017).	The I C S of GN Bank Ghana	Descriptive study design	There exist effective ICS in GN bank Ghana	The study focused on a single bank.	The study focused on all banks operating in Kenya
Adetiloye, K. A., Olokoyo, F. O. & Taiwo, J. N. (2016).	Fraud Prevention and Internal Control in the Nigerian Banking System	Survey design	Internal control is very effective for fraud control.	The study focused on fraud prevention in Nigerian banking system	The study focused on ICS plays and prevention of fraud in Kenya banking Sector
Mwithi, J. M. & Kamau, J. N. (2015).	Strategies adopted by commercial banks in Kenya to combat fraud: a survey of selected commercial banks in Kenya	Descriptive research design	The findings showed that Internal Control contribute most to combating fraud followed by Know your customer then Technology application while Legal framework contributed little to	This study mainly focused on strategies adopted to combat fraud in selected banks	The study was based on all banks without omitting any

			combating fraud		
Ayagre, P., Appiah-Gyamerah, I. & Nartey, J. (2014).	The effectiveness of I C S of banks. The case of Ghanaian banks	Case study research design	Control environment and monitoring activities components of ICS are effective	The study was based on only two components of ICS	The study included all the components of ICS
Amudo, A. & Inanga, E. L. (2009)	Evaluation of I C S. A case from Uganda.	Case study research design	Four components of ICS were not functioning well except for communication of information.	This study focused on AfDB in Uganda	The study focused on all banks registered and operating in Kenya

Appendix VI: Eigen Table

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.009	21.778	21.778	5.009	21.778	21.778	3.375	14.672	14.672
2	3.665	15.937	37.714	3.665	15.937	37.714	3.157	13.724	28.396
3	2.358	10.252	47.966	2.358	10.252	47.966	2.781	12.089	40.486
4	2.060	8.958	56.924	2.060	8.958	56.924	2.406	10.463	50.948
5	1.669	7.258	64.182	1.669	7.258	64.182	2.301	10.003	60.951
6	1.379	5.994	70.176	1.379	5.994	70.176	1.874	8.147	69.098
7	1.341	5.833	76.008	1.341	5.833	76.008	1.589	6.911	76.008
8	1.179	5.126	81.134						
9	.794	3.454	84.588						
10	.671	2.918	87.506						
11	.612	2.659	90.165						
12	.562	2.445	92.611						
13	.348	1.512	94.123						
14	.299	1.299	95.422						
15	.267	1.160	96.582						
16	.207	.899	97.481						
17	.169	.734	98.215						
18	.140	.608	98.823						
19	.117	.508	99.331						
20	.078	.338	99.668						
21	.031	.134	99.803						
22	.024	.104	99.907						
23	.021	.093	100.000						

Extraction Method: Principal Component Analysis.

Appendix VII: Days Sales in Receivables Index

Bank	Kshs. "000" 2017	Kshs. "000" 2016	DSRI
1	$\left(\frac{15382987}{1599917}\right) = 9.615$	$\left(\frac{14228599}{1517030}\right) = 9.379$	1.025
2	$\left(\frac{27388460}{3440446}\right) = 7.961$	$\left(\frac{31541959}{5385828}\right) = 5.856$	1.359
3	$\left(\frac{42207280}{6555775}\right) = 6.438$	$\left(\frac{36400900}{5363623}\right) = 6.787$	0.949
4	$\left(\frac{20641381}{3340006}\right) = 6.180$	$\left(\frac{19246080}{2751352}\right) = 6.995$	0.883
5	$\left(\frac{168397417}{29782086}\right) = 5.564$	$\left(\frac{168509529}{31191250}\right) = 5.402$	1.030
6	$\left(\frac{37187236}{9516596}\right) = 3.908$	$\left(\frac{27436980}{8983592}\right) = 3.054$	1.280
7	$\left(\frac{101409798}{15453400}\right) = 6.562$	$\left(\frac{100314461}{14032832}\right) = 7.149$	0.918
8	$\left(\frac{8421072}{1276260}\right) = 6.598$	$\left(\frac{9161484}{1437812}\right) = 6.372$	1.035
9	$\left(\frac{253861644}{39956131}\right) = 6.354$	$\left(\frac{236935564}{41011198}\right) = 5.777$	1.100
10	$\left(\frac{9698546}{1353194}\right) = 7.167$	$\left(\frac{7899394}{1235067}\right) = 6.396$	1.121
11	$\left(\frac{9199779}{503878}\right) = 18.258$	$\left(\frac{8733212}{607010}\right) = 14.387$	1.269
12	$\left(\frac{148515793}{16903441}\right) = 8.786$	$\left(\frac{136685924}{16872294}\right) = 8.101$	1.085
13	$\left(\frac{16370967}{2938357}\right) = 5.571$	$\left(\frac{24473512}{1287068}\right) = 19.015$	0.293
14	$\left(\frac{214484733}{47727003}\right) = 4.494$	$\left(\frac{213805548}{50323827}\right) = 4.249$	1.058
15	$\left(\frac{43471853}{6475610}\right) = 6.713$	$\left(\frac{50163555}{8998183}\right) = 5.575$	1.204
16	$\left(\frac{9726807}{1286201}\right) = 15.337$	$\left(\frac{10939122}{1451569}\right) = 7.536$	2.035
17	$\left(\frac{13203981}{1874281}\right) = 7.045$	$\left(\frac{12906196}{2216825}\right) = 5.822$	1.210

18	$\left(\frac{9616965}{972453}\right) = 9.889$	$\left(\frac{8974527}{1233064}\right) = 7.278$	1.359
19	$\left(\frac{19384156}{2630602}\right) = 7.369$	$\left(\frac{16193046}{2448012}\right) = 6.615$	1.114
20	$\left(\frac{120656819}{16568224}\right) = 7.282$	$\left(\frac{106585737}{16259614}\right) = 6.555$	1.111
21	$\left(\frac{387942858}{61001681}\right) = 6.360$	$\left(\frac{353900051}{58184828}\right) = 6.082$	1.046
22	$\left(\frac{7288835}{809209}\right) = 9.007$	$\left(\frac{6657374}{747200}\right) = 8.910$	1.011
23	$\left(\frac{52361043}{9079875}\right) = 5.767$	$\left(\frac{55019784}{10568097}\right) = 5.206$	1.108
24	$\left(\frac{112322028}{13495100}\right) = 8.323$	$\left(\frac{107097133}{14672541}\right) = 7.299$	1.140
25	$\left(\frac{5902031}{470425}\right) = 12.546$	$\left(\frac{5799443}{478319}\right) = 12.125$	1.035
26	$\left(\frac{38817386}{4637940}\right) = 8.370$	$\left(\frac{39356307}{4543768}\right) = 8.662$	0.966
27	$\left(\frac{11409325}{1703672}\right) = 6.697$	$\left(\frac{13517012}{2497072}\right) = 5.413$	1.237
28	$\left(\frac{4404664}{363436}\right) = 12.120$	$\left(\frac{4876333}{687087}\right) = 7.097$	1.708
29	$\left(\frac{5238814}{550219}\right) = 9.521$	$\left(\frac{7433605}{842176}\right) = 8.827$	1.079
30	$\left(\frac{130535810}{18647597}\right) = 7.000$	$\left(\frac{115587723}{18140291}\right) = 6.372$	1.099
31	$\left(\frac{126294470}{26518713}\right) = 4.762$	$\left(\frac{122711038}{27311201}\right) = 4.493$	1.060
32	$\left(\frac{6604120}{972046}\right) = 6.794$	$\left(\frac{6367429}{1086019}\right) = 5.863$	1.159
33	$\left(\frac{18870101}{1594671}\right) = 11.833$	$\left(\frac{15292829}{1373064}\right) = 11.138$	1.062

Appendix VIII: Gross Margin Index

Bank	Kshs. "000" 2017	Kshs. "000" 2016	GMI
1	$\left(\frac{10005864}{29782086}\right) = 0.336$	$\left(\frac{10439686}{31191250}\right) = 0.335$	0.997
2	$\left(\frac{35185}{3440446}\right) = 0.010$	$\left(\frac{-16497}{5385828}\right) = -0.003$	-0.306
3	$\left(\frac{5053433}{6555775}\right) = 0.771$	$\left(\frac{3875810}{5363623}\right) = 0.723$	0.937
4	$\left(\frac{2675181}{3340006}\right) = 0.801$	$\left(\frac{2185360}{2751352}\right) = 0.794$	0.992
5	$\left(\frac{10005864}{29782086}\right) = 0.336$	$\left(\frac{10439686}{31191250}\right) = 0.335$	0.997
6	$\left(\frac{6373018}{9516596}\right) = 0.670$	$\left(\frac{6033391}{8983592}\right) = 0.672$	1.003
7	$\left(\frac{7335746}{15453400}\right) = 0.475$	$\left(\frac{7592523}{213677928}\right) = 0.541$	1.139
8	$\left(\frac{-438570}{1276260}\right) = -0.344$	$\left(\frac{-276777}{1437812}\right) = -0.192$	0.558
9	$\left(\frac{16502181}{39956131}\right) = 0.413$	$\left(\frac{18024143}{41011198}\right) = 0.439$	1.063
10	$\left(\frac{179056}{1353194}\right) = 0.132$	$\left(\frac{158135}{1235067}\right) = 0.128$	0.970
11	$\left(\frac{57632}{503878}\right) = 0.114$	$\left(\frac{94910}{607010}\right) = 0.156$	1.372
12	$\left(\frac{8227558}{16903441}\right) = 0.487$	$\left(\frac{8876385}{16872294}\right) = 0.526$	1.080
13	$\left(\frac{-1434014}{2938357}\right) = -0.488$	$\left(\frac{-2889014}{1287068}\right) = -2.245$	4.600
14	$\left(\frac{23085843}{47727003}\right) = 0.484$	$\left(\frac{22777572}{50323827}\right) = 0.453$	0.936
15	$\left(\frac{-1370841}{6475610}\right) = -0.212$	$\left(\frac{633419}{8998183}\right) = 0.070$	-0.332
16	$\left(\frac{216493}{1286201}\right) = 0.168$	$\left(\frac{-41488}{1451569}\right) = -0.029$	-0.170
17	$\left(\frac{241305}{1874281}\right) = 0.129$	$\left(\frac{659338}{2216825}\right) = 0.297$	2.306

18	$\left(\frac{227567}{972453}\right) = 0.234$	$\left(\frac{301904}{1233064}\right) = 0.245$	1.046
19	$\left(\frac{253955}{2630602}\right) = 0.097$	$\left(\frac{753922}{2448012}\right) = 0.308$	3.175
20	$\left(\frac{7516380}{16568224}\right) = 0.454$	$\left(\frac{8651034}{16259614}\right) = 0.532$	1.172
21	$\left(\frac{27471955}{61001681}\right) = 0.450$	$\left(\frac{28482325}{58184828}\right) = 0.490$	1.088
22	$\left(\frac{116015}{809209}\right) = 0.143$	$\left(\frac{35505}{747200}\right) = 0.048$	0.332
23	$\left(\frac{8339502}{9079875}\right) = 0.918$	$\left(\frac{10509250}{10568097}\right) = 0.994$	1.083
24	$\left(\frac{5676037}{13495100}\right) = 0.421$	$\left(\frac{5925510}{14672541}\right) = 0.404$	0.960
25	$\left(\frac{95964}{470425}\right) = 0.204$	$\left(\frac{104666}{478319}\right) = 0.219$	1.073
26	$\left(\frac{1976977}{4637940}\right) = 0.426$	$\left(\frac{2335822}{4543768}\right) = 0.514$	1.207
27	$\left(\frac{-632941}{1703672}\right) = -0.372$	$\left(\frac{61892}{2497072}\right) = 0.025$	-0.067
28	$\left(\frac{-360627}{363436}\right) = -0.992$	$\left(\frac{-2267305}{687047}\right) = -3.300$	-3.327
29	$\left(\frac{-1575782}{550219}\right) = -2.864$	$\left(\frac{-967896}{842176}\right) = -1.149$	0.401
30	$\left(\frac{5599452}{18647597}\right) = 0.297$	$\left(\frac{7186794}{18140291}\right) = 0.396$	1.333
31	$\left(\frac{9509984}{26518713}\right) = 0.359$	$\left(\frac{12764426}{27311201}\right) = 0.467$	1.301
32	$\left(\frac{53984}{972046}\right) = 0.056$	$\left(\frac{160024}{1086019}\right) = 0.147$	2.631
33	$\left(\frac{836166}{1594671}\right) = 0.524$	$\left(\frac{765493}{1373064}\right) = 0.558$	1.064

Appendix IX: Asset Quality Index

Bank	Kshs. "000" 2017	Kshs. "000" 2016	AQI
1	$1-\left(\frac{23789322}{24804407}\right)=0.041$	$1-\left(\frac{21414594}{22422351}\right)=0.045$	0.912
2	$1-\left(\frac{47902103}{54191291}\right)=0.116$	$1-\left(\frac{49473542}{55995671}\right)=0.116$	1.000
3	$1-\left(\frac{60507939}{96132100}\right)=0.371$	$1-\left(\frac{51801861}{82907475}\right)=0.375$	0.988
4	$1-\left(\frac{26551518}{56630656}\right)=0.531$	$1-\left(\frac{23353294}{47815076}\right)=0.512$	1.038
5	$1-\left(\frac{270188551}{271682166}\right)=0.005$	$1-\left(\frac{257668455}{259498223}\right)=0.007$	0.709
6	$1-\left(\frac{98231911}{98231911}\right)=0.000$	$1-\left(\frac{103323540}{103323540}\right)=0.000$	0.000
7	$1-\left(\frac{155651144}{229525229}\right)=0.322$	$1-\left(\frac{152373646}{213677928}\right)=0.287$	1.122
8	$1-\left(\frac{10610317}{13455744}\right)=0.211$	$1-\left(\frac{10976400}{13917895}\right)=0.211$	1.000
9	$1-\left(\frac{334128303}{382829640}\right)=0.127$	$1-\left(\frac{308316036}{349997760}\right)=0.119$	1.066
10	$1-\left(\frac{12513791}{14465074}\right)=0.135$	$1-\left(\frac{10598175}{12201968}\right)=0.131$	1.027
11	$1-\left(\frac{386040146}{406402486}\right)=0.050$	$1-\left(\frac{358081361}{379748996}\right)=0.057$	0.876
12	$1-\left(\frac{178512753}{270081538}\right)=0.339$	$1-\left(\frac{164288474}{244123818}\right)=0.327$	1.037
13	$1-\left(\frac{52571576}{53455760}\right)=0.017$	$1-\left(\frac{46256196}{47123839}\right)=0.018$	0.923
14	$1-\left(\frac{379677716}{406402486}\right)=0.066$	$1-\left(\frac{352478523}{379748996}\right)=0.072$	0.919
15	$1-\left(\frac{60049335}{69050943}\right)=0.130$	$1-\left(\frac{633893790}{69432374}\right)=0.087$	1.494
16	$1-\left(\frac{17194266}{17359968}\right)=0.010$	$1-\left(\frac{14804364}{14962089}\right)=0.011$	0.949
17	$1-\left(\frac{22981348}{27627849}\right)=0.168$	$1-\left(\frac{25073221}{29619072}\right)=0.153$	1.095

18	$1-\left(\frac{12314324}{15802759}\right)=0.221$	$1-\left(\frac{11761510}{14705351}\right)=0.200$	1.106
19	$1-\left(\frac{31188624}{31316228}\right)=0.004$	$1-\left(\frac{152935029}{161847351}\right)=0.055$	0.073
20	$1-\left(\frac{160630060}{183952517}\right)=0.127$	$1-\left(\frac{144771102}{164116122}\right)=0.118$	1.077
21	$1-\left(\frac{523564755}{555630311}\right)=0.058$	$1-\left(\frac{469210767}{504777675}\right)=0.070$	0.823
22	$1-\left(\frac{9364043}{10576525}\right)=0.115$	$1-\left(\frac{8431256}{9920247}\right)=0.150$	0.766
23	$1-\left(\frac{87615074}{109942042}\right)=0.203$	$1-\left(\frac{82611727}{111929158}\right)=0.262$	0.775
24	$1-\left(\frac{170214835}{192816873}\right)=0.117$	$1-\left(\frac{152137193}{161847351}\right)=0.060$	1.950
25	$1-\left(\frac{7286706}{9541251}\right)=0.236$	$1-\left(\frac{7084589}{9426931}\right)=0.248$	0.950
26	$1-\left(\frac{55487250}{76438199}\right)=0.274$	$1-\left(\frac{51519787}{65338215}\right)=0.211$	1.296
27	$1-\left(\frac{17111037}{19301752}\right)=0.113$	$1-\left(\frac{18015765}{20875499}\right)=0.137$	0.825
28	$1-\left(\frac{8052051}{11745145}\right)=0.314$	$1-\left(\frac{6225255}{9902771}\right)=0.371$	0.846
29	$1-\left(\frac{7964515}{11147949}\right)=0.286$	$1-\left(\frac{10543867}{13802498}\right)=0.236$	1.211
30	$1-\left(\frac{167053778}{246787723}\right)=0.323$	$1-\left(\frac{150113637}{206329837}\right)=0.272$	1.186
31	$1-\left(\frac{283792734}{286124638}\right)=0.008$	$1-\left(\frac{247675446}{250274108}\right)=0.010$	0.770
32	$1-\left(\frac{9678544}{10241368}\right)=0.055$	$1-\left(\frac{10097938}{10372441}\right)=0.026$	2.078
33	$1-\left(\frac{24258392}{25985160}\right)=0.066$	$1-\left(\frac{20034749}{22403481}\right)=0.106$	0.624

Appendix X: Sales Growth Index

Bank	Kshs. "000" 2017	Kshs. "000" 2016	SGI
1	1599917	1517030	1.055
2	3440446	5385828	0.639
3	6555775	5363623	1.222
4	3340006	2751352	1.214
5	29782086	31191250	0.955
6	9516596	8983592	1.059
7	15453400	14032832	1.101
8	1276260	1437812	0.888
9	39956131	41011198	0.974
10	1353194	1235067	1.096
11	503878	607010	0.830
12	16903411	16872294	1.002
13	2938357	1287068	2.283
14	47727003	50323827	0.948
15	6475610	8998183	0.720
16	1286201	1451569	0.886
17	809209	747200	1.083
18	972453	1233064	0.789
19	2630602	2448012	1.075
20	16568224	16259614	1.019
21	61001681	58184828	1.048
22	809209	747200	1.083
23	9079875	10568097	0.859
24	13495100	14672541	0.920
25	470425	478319	0.983
26	4637940	4543768	1.021
27	1703672	2497072	0.682
28	363436	687087	0.529

29	550219	842176	0.653
30	18647597	18140291	1.028
31	26518713	27311201	0.971
32	972046	1086019	0.895
33	1594671	1373064	1.161

Appendix XI: Depreciation Index

Bank	Kshs. "000" 2017	Kshs. "000" 2016	DEPI
1	$\frac{56979}{494716+56979}=0.103$	$\frac{54812}{515978+54812}=0.096$	0.932
2	$\frac{222250}{2353256+222250}=0.086$	$\frac{183985}{2461496+183985}=0.070$	0.809
3	$\frac{34892}{194274+34892}=0.152$	$\frac{43761}{204263+43761}=0.176$	1.161
4	$\frac{62025}{915152+62025}=0.063$	$\frac{22669}{971430+22669}=0.023$	0.362
5	$\frac{766918}{2744065+766918}=0.218$	$\frac{664921}{3080831+664921}=0.178$	0.814
6	$\frac{93548}{556114+93548}=0.144$	$\frac{96301}{606807+96301}=0.137$	0.951
7	$\frac{307339}{2422316+307339}=0.113$	$\frac{263564}{1898403+263564}=0.122$	1.079
8	$\frac{80568}{746346+80568}=0.097$	$\frac{93220}{795453+93220}=0.105$	1.081
9	$\frac{1951040}{7493574+1951040}=0.207$	$\frac{1936699}{8308698+1936699}=0.189$	0.913
10	$\frac{58323}{291186+58323}=0.167$	$\frac{45028}{305013+45028}=0.129$	0.770
11	$\frac{18673}{218441+18673}=0.079$	$\frac{19704}{229185+19704}=0.079$	1.000
12	$\frac{570146}{5020237+570146}=0.102$	$\frac{528585}{5072986+528585}=0.094$	0.925
13	$\frac{188086}{806636+188086}=0.189$	$\frac{294807}{872176+294807}=0.253$	1.337
14	$\frac{2607468}{6004819+2607468}=0.303$	$\frac{2816348}{7334662+2816348}=0.277$	0.916
15	$\frac{752158}{3615785+752158}=0.172$	$\frac{690270}{4158968+690270}=0.142$	0.828
16	$\frac{72174}{568881+72174}=0.113$	$\frac{67389}{222413+67389}=0.233$	2.058
17	$\frac{128662}{276627+128662}=0.317$	$\frac{110147}{397084+110147}=0.217$	0.685

18	$\frac{52504}{98827+52504}=0.347$	$\frac{44185}{135674+44185}=0.246$	0.708
19	$\frac{118772}{319279+118772}=0.271$	$\frac{117599}{385056+117599}=0.234$	0.863
20	$\frac{218095}{627695+218095}=0.258$	$\frac{223452}{655069+223452}=0.254$	0.986
21	$\frac{999307}{6194697+999307}=0.139$	$\frac{760744}{6036804+760744}=0.112$	0.805
22	$\frac{34161}{119289+34161}=0.223$	$\frac{33510}{81580+33510}=0.291$	1.306
23	$\frac{565520}{3710328+565520}=0.132$	$\frac{412605}{4110825+412605}=0.091$	0.691
24	$\frac{200796}{1024458+200796}=0.164$	$\frac{191673}{861294+191673}=0.182$	1.110
25	$\frac{19108}{57572+19108}=0.249$	$\frac{21153}{71785+21153}=0.228$	0.914
26	$\frac{138549}{1555160+138549}=0.082$	$\frac{102297}{1310664+102297}=0.072$	0.883
27	$\frac{126365}{497192+126365}=0.203$	$\frac{111234}{537399+111234}=0.171$	0.845
28	$\frac{38024}{241339+38024}=0.136$	$\frac{51309}{277253+51309}=0.156$	1.148
29	$\frac{49926}{427482+49926}=0.105$	$\frac{51858}{373254+51858}=0.122$	1.162
30	$\frac{378666}{2251519+378666}=0.144$	$\frac{347253}{2203745+347253}=0.016$	0.108
31	$\frac{419971}{3351240+419971}=0.111$	$\frac{441737}{2985751+441737}=0.129$	1.161
32	$\frac{59390}{178257+59390}=0.250$	$\frac{52412}{172284+52412}=0.233$	0.933
33	$\frac{34972}{174508+34972}=0.167$	$\frac{35662}{192350+35662}=0.156$	0.937

Appendix XII: M-Score Results

Bank	DSRI	GMI	AQI	SGI	DEPI	M-SCORE
1	1.025	0.997	0.912	1.055	0.932	-2.92117
2	1.359	-0.306	1.000	0.639	0.809	-4.08605
3	0.949	0.937	0.988	1.222	1.161	-2.84877
4	0.883	0.992	1.038	1.214	0.362	-2.91483
5	1.030	0.997	0.709	0.955	0.814	-3.12176
6	1.280	1.003	0.000	1.059	0.951	-3.24178
7	0.918	1.139	1.122	1.101	1.079	-2.70734
8	1.035	0.558	1.000	0.888	1.081	-3.36228
9	1.100	1.063	1.066	0.974	0.913	-2.76844
10	1.121	0.970	1.027	1.096	0.770	-2.78636
11	1.269	1.372	0.876	0.830	1.000	-2.556
12	1.085	1.080	1.037	1.002	0.925	-2.76122
13	0.293	4.600	0.923	2.283	1.337	0.671048
14	1.058	0.936	0.919	0.948	0.916	-3.02356
15	1.204	-0.332	1.494	0.720	0.828	-3.88412
16	2.035	-0.170	0.949	0.886	2.058	-3.12599
17	1.210	2.306	1.095	1.083	0.685	-1.48079
18	1.359	1.046	1.106	0.789	0.708	-2.70154
19	1.114	3.175	0.073	1.075	0.863	-1.36522
20	1.111	1.172	1.077	1.019	0.986	-2.61403
21	1.046	1.088	0.823	1.048	0.805	-2.89282
22	1.011	0.332	0.766	1.083	1.306	-3.56166
23	1.108	1.083	0.775	0.859	0.691	-3.0225
24	1.140	0.960	1.950	0.920	1.110	-2.32226
25	1.035	1.073	0.950	0.983	0.914	-2.8751
26	0.966	1.207	1.296	1.021	0.883	-2.58137
27	1.237	-0.067	0.825	0.682	0.845	-4.03902
28	1.708	-3.327	0.846	0.529	1.148	-6.66977
29	1.079	0.401	1.211	0.653	1.162	-3.50302

30	1.099	1.333	1.186	1.028	0.108	-2.5009
31	1.060	1.301	0.770	0.971	1.161	-2.73687
32	1.159	2.631	2.078	0.895	0.933	-0.75366
33	1.062	1.064	0.624	1.161	0.937	-2.92426

Appendix XIII: Research Authorization Letter (NACOSTI)

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/18/31209/21478**

Date: **27th February, 2018**

Samuel Ngigi Nyakarimi
University of Embu
P.O. Box 6-60100
EMBU.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Internal Control System and fraud prevention,"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **26th February, 2019.**

You are advised to report to **the Chief Executive Officers of selected Banks, the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

GP Kalerwa
GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The Chief Executive Officers
Selected Banks.

The County Commissioner
Nairobi County.

Appendix XIV: Research Clearance Permit (NACOSTI)

CONDITIONS

1. The License is valid for the proposed research, research site specified period.
2. Both the Licence and any rights thereunder are non-transferable.
3. Upon request of the Commission, the Licensee shall submit a progress report.
4. The Licensee shall report to the County Director of Education and County Governor in the area of research before commencement of the research.
5. Excavation, filming and collection of specimens are subject to further permissions from relevant Government agencies.
6. This Licence does not give authority to transfer research materials.
7. The Licensee shall submit two (2) hard copies and upload a soft copy of their final report.
8. The Commission reserves the right to modify the conditions of this Licence including its cancellation without prior notice.

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No.A 17691

CONDITIONS: see back page

THIS IS TO CERTIFY THAT:
MR. SAMUEL NGIGI NYAKARIMI
of UNIVERSITY OF EMBU, 0-60200 MERU,has been permitted to conduct research in *Nairobi County*

on the topic: *INTERNAL CONTROL SYSTEM AND FRAUD PREVENTION*

for the period ending:
26th February,2019

Permit No : NACOSTI/P/18/31209/21478
Date Of Issue : 27th February,2018
Fee Recieved :Ksh 2000

Applicant's Signature

Director General
National Commission for Science, Technology & Innovation