2019

The Relationship between data quality and internal audit findings of commercial banks in Kenya.

Apondi, Mary Ochieng'
Strathmore Business School
Strathmore University

THE RELATIONSHIP BETWEEN DATA QUALITY AND INTERNAL AUDIT FINDINGS OF COMMERCIAL BANKS IN KENYA

MARY APONDI OCHIENG

086084

A THESIS SUBMITTED TO STRATHMORE BUSINESS SCHOOL IN THE PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER'S IN PUBLIC POLICY AND MANAGEMENT

OF STRATHMORE UNIVERSITY

2019

DECLARATION

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

Mary Apondi Ochieng

December 2019

Approval

This thesis by Mary Apondi Ochieng has been reviewed and approved by:

Dr. Thomas Kibua (Supervisor)

Strathmore Business School

Dr. George Njenga

Dean, Strathmore Business School

Prof. Ruth Kiraka

Dean, School of Graduate Studies

Strathmore University

ABSTRACT

Study's main objective was to establish the association between data quality and internal audit findings of commercial banks in Kenya. The study specifically sought to establish the relationship between data accessibility, data completeness, and data relevance on internal audit findings of commercial banks in Kenya. Adopted research design was descriptive whereby the study targeted all the 42 commercial banks in Kenya. Sample size selection was through stratified random sampling technique and a sample of 33 respondents was selected using simple random sampling. Primary data was used and was collected using questionnaires. Data collected was analyzed using SPSS version 21. Descriptive statistics were used to analyze quantitative data and presentations were done in tables and figures. Multiple regression analysis was used in ascertaining the relationship between data quality and internal audit findings of commercial banks in Kenya. The study found that data accessibility, data completion and data relevance significantly influence internal audit findings of commercial banks in Kenya. The study concluded that increasing data accessibility, data completion and data relevance by a single unit will lead to an increase in internal audit findings of commercial banks in Kenya. The study therefore recommmends the management of commercial banks in Kenya to ensure that internal auditors can access information directly and easily. Banks management to ensure that they employ experts to help in mining of data, and to ensure their data is complete through data verification processes.

TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

AEXP	Auditing Experience
AIS	Accounting Information Systems
AQ	Accounting Qualifications
BCBS	Basel Committee on Banking Supervision
CBK	Central Bank of Kenya
CRBs	Credit Reference Bureaus
CIA	Chief Internal Auditor
IAF	Internal Audit Functions
IT	Information Technology
IIA	Institute of Internal Auditors
MFBs	Microfinance Banks
MRPs	Money Remittance Providers

ACKNOWLEDGEMENTS

Special thanks to Almighty God for the gift of life and strength to accomplish this academic work.

My sincere gratitude goes to my supervisor, Dr. Thomas Kibua for his continuous guidance and constructive feedback that contributed greatly to the conceptualization and completion of this thesis.

To my sisters, Everline Leah Ochieng and Lucy Racheal Atieno, I am grateful for your unwavering affirmation and encouragement that has been a great source of motivation. To my husband Peter Kimani, thank you for your continuous encouragement, time, support and patience during my years of study.

Finally, my heartfelt appreciation goes to the faculty at Strathmore Business School, for being approachable and supportive throughout the process of carrying out this study.

DEDICATION

To

My late father, Lucas Ochieng Oyieyo, and my mother, Lilian Auma Ochieng for being the greatest supporters of my academic pursuits and for always encouraging me to work hard and strive for excellence in all my endeavors

My husband who encouraged me to pursue Masters in Public Policy and Management course

CHAPTER ONE

INTRODUCTION

The study is on the relationship between data quality and internal audit findings. This chapter states the background of the study, statement of the problem, objectives of the study, research questions, and significance of the study and scope of the study. Chapter two presents the literature review which include; theoretical review, empirical review, summary of literature, research gap and conceptual framework. Chapter three states the research methodology which include; research design, population, sampling procedure, data collection instrument, research quality, data collection procedure, research quality, data analysis and presentation and ethical consideration. Chapter four covers data analysis, presentation and discussions, while chapter five depicts the conclusion and recommendations.

1.1 Background of the Study

The development of information technology in the business world has led to increase in information in organizations. Therefore, organizations store large amount of data to use in making decisions. Nonetheless, when the volume of data increases it becomes more complex to manage it (Haug, Zachariassen, & Liempd, 2011). Watts, Shankaranarayanan and Even (2009) states that the risk of poor information is becoming high as large volumes of data are being collected by organizations. If there are no data strategies of quality levels that are defined, this large quantity of information can be harmful and overwhelming. Therefore, analyzing data quality is important in the process of decision making, business development and maintenance (Nord & Xu, 2015). Bad data is compared to a virus (Levitin & Redman, 2016). It is difficult to detect a virus hence; this creates uncertainty and may have an adverse

effect to the business. Therefore the issues of data quality are of great importance for improved organizational performance ensuring survival and competitive advantage (Scully & Fawcett, 2013; Nord & Xu, 2015).

Regulators and other stakeholders are increasingly demanding greater transparency into bank's operations. Basel Committee (2013) asserts that, from the financial crisis experienced in 2007, the lesson learnt is that IT and data architectures were not adequate in the management of financial risks, complicated financial instruments, global savings glut and lowering interest rate (Scully & Fawcett, 2013). Internal Auditors are thus consistently challenged to provide high-quality audits that meet the Regulators and other stakeholders' requirements and provide forward looking assurance to management (Nord & Xu, 2015). Audit quality perception is not unidimensional, hence varies between stakeholders. The Institute of Internal Auditors (2017) defines audit quality as the independence, objectivity, consulting activity and assurance designed to provide an accurate picture over a period of time of a firms' performance. Matoke and Omwenga (2016) explained audit quality in two dimensions: the first one was detection of errors and misstatements in financial statements and the second was to report those errors and misstatements. The quality of audit is the primary goal of internal auditors and data quality during internal audit assures the achievement of quality financial statements or reports for commercial banks. Accurate internal and external data in banks is key enabling identification, assessing and mitigation of risk by data users making strategic decisions in business and determining adequacy of capital and liquidity (Basel Committee, 2013).

In Kenya's financial sector, the most dominant institutions are commercial banks this makes them significantly contribute towards the economic growth and financial stability of this Country. Kenyan financial industry has over the past few years enjoyed exponential growth in deposits, loans, assets, profitability and regional expansion. Banks have moved from traditional banking products and have had to invest in digital systems such as mobile banking, internet banking and other alternative channel systems that generate a lot of data (Mburu, 2017). Statistical data obtained from banking institutions, are key in developing Monetary Policy and Economic Statistics.

1.1.1 Data Quality

According to Gathaiya (2016), data that is of good quality is very important in any company as it plays a key role in planning, decision making and in deploying resources to facilitate smooth running of its operations. Assessment of information obtained from a system either manually or electronically with the purpose of ensuring that the data is fit for certain purpose in a given situation is considered to be data quality. Data quality is used in this paper to investigate how fit some data is in serving users intention (Watts, Shankaranarayanan, & Even, 2009).

Fast-evolving technologies that generate-increasing amounts of data have created an opportunity for internal audit departments to leverage data to evaluate risk and drive audit insight. As a result, data analytics is increasingly becoming an indispensable element of the internal audit toolset. Data analytics breaks down vast volumes of data and then rebuilds it to

form information clusters that the auditor can use to analyse the risk landscape. Effective data analytics elevates performance, provides greater value to the organization, and increases the credibility of an internal audit with its stakeholders. It is also helping to transform internal audits by significantly automating processes, supporting compliance within existing organizational policies, and providing management with a higher level of operational assurance (Ahmed, Ayasra & Zawaideh, 2013).

However, such opportunities are often coupled with risks. In making the most of data analytics, internal audit departments face issues, including: inaccurate or misleading results; misuse or misinterpretation of data; conflicts in independence; development of talent; and challenges around data privacy and security. To address the above, internal auditors should focus on effective analysis of better data and strengthen their internal audit governance framework to cover emerging data-analytics-related risks surrounding quality, talent, independence and security (Thuma, 2012).

Data quality can be divided into subcategories and dimensions. There are no theoretical underpinnings on why and how certain attributes of data quality are derived, defined and grouped. Ballou and Pazer (1985) divide data quality into four dimensions: accuracy, timeliness, completeness, and consistency. Haug, Zachariassen and Liempd (2011) focus on how to identify the optimal data quality level. Singh and Singh (2010) has grouped a list of six primary dimensions namely; completeness, consistency, validity, integrity, conformity and accuracy. Redman (2016) describes data quality into six categories namely; accuracy,

validity, reliability, timeliness, relevance and completeness. In a survey involving 500 respondents by The Institute of Internal Auditors (IIA) North American (2016), 47% of respondents noted that internal audit was slightly or not at all involved in evaluating the quality of data used in their organization. Nearly one-quarter (23%) noted that they were slightly or not at all confident in their organizations' data-based strategic decisions. This study will use three major data quality dimensions to evaluate their impact on internal audit findings of commercial banks, namely; accessibility, completeness and relevance, as they are the key elements of data quality that have great impacts of the auditor findings (Basel Committee, 2013).

Data accessibility refers to a user's ability to retrieve data stored within a database or other repository. Data completeness denotes the degree to all required data are available in the dataset, while Data relevance is a level of consistency between the data content and the area of interest of the user. Proper handling of the organizational data and maintaining data quality levels is of utmost importance in order to obtain better results in the company's performance and decision making (Chen, Yu & Wang, 2012).

Some of the common challenges relating with data quality is incomplete or missing information, errors in data imputed data, duplicate information and outdated data. The advantage of ensuring data quality is that it leads to increased efficiency, improved levels of customer satisfaction and aids in informed decision making (Redman, 2016). Production of fit data isn't the end but it is just a mild step towards operations of an organization,

management of performance and preparing for governance (Nord & Xu, 2015). High-quality data are the prerequisites for analyzing and guaranteeing the value of the data. Nowadays, majority of the companies have to use data that is not of good quality and therefore they end up making poor decisions. Generally, quality of decisions depends on the data used. The efficiency of an organization is affected by data that is used, that is its reliability, relevance and completeness and acts as the pillar towards process of decision making, (Watts, Shankaranarayanan & Even, 2009).

1.1.2 Internal Audit Findings

Once internal auditors have completed their audit process, they are required, through an audit report to present what they found. Pickett (2011) explained that the role of internal auditor report is providing avenues for catching the attention of management. In an internal audit report the following are presented: challenges, their causes, effects, the response of the management and what is recommended. These reports assist the management to take the required actions and make decisions towards compliance, management of risk, systems for internal control and utilization of resources effectively and efficiently, adding value to organizations performance and operations. Also, individuals who can access the reports and are not part of the audit team get to understand what is done by auditors (Hubbard 2010).

According to De-Angelo (2011), internal audit findings are combined possibility that an auditor will become aware of and account for material misstatement. This is achieved by an internal auditor's capacity to spot misstatements and readiness to divulge the misstatements that are discovered in an audit assignment. The internal auditing service is just another element of the corporate governance structure and significant aspect of the regulatory system

for protecting the interests of shareholders and to serve the other stakeholders in public firms around the world (Hutchinson & Zain, 2014). It is an exercise of improving risk management, operations and administration of the entity to achieve the intended goals and the protections of the shareholders wealth and provides accurate information to financial accounting information users. It helps the institution create discipline, improve management process and risk management to achieve the organizational goals. Firm managers are always engaged in returns management to increase their incentive and maximize shareholders wealth.

The internal audit report is prepared as a form of communication between internal audit and the management of the organization additionally, it is established as a crucial guideline to enhance the management of the company and ensure its success (Ljubisavljević & Jovanovi, 2011). Yet, extensive research has been conducted on factors influencing internal auditor's judgments and decisions, the audit committee composition and management and evaluation of internal audit quality. Few attempts have been made to determine the relationship between data quality and internal audit findings. Hutchinson & Zain (2014), made a start in this area by examining the impact of accounting qualifications and auditing experience of the internal audit staff on internal audit findings.

1.1.3 Commercial Banks in Kenya

The role that is performed by the Kenyan banking sector is very important especially when it comes to industry offering financial services, especially with savings mobilization, and credit extension. Countries in Africa especially in the banking industry have a long way in struggling with the issue of high rates of interest which end up restraining investment through

growth of the economy and credit. Based on the 2017 banks annual supervision report, the banking industry which is regulated by CBK comprises of 43 banking institutions of which 42 of them are commercial banks and ovine is a mortgage financing institution, foreign banks have eight representative offices in the country, MFBs are twelve, CRBs are three, MRBs are fifteen and forex Bureaus are eighty.

Out of the 42 commercial banks in the country only ten of them are local subsidiaries for foreign banks while foreign bank branches are four. All the MFBs, CRBs, forex bureaus and MRPs are under private ownership. Kenya's banking sector is under the governorship of Companies Act, the CBK Act, the Banking Act, and other guidelines that are issued by regulatory body which is the CBK. The year 2001 is when the government embraced the Amendment Act that gave CBK authority of regulating rates of interest. Globally, banks are starting to realize the power information has over its various operations that range from their functions, analysis of sentiments, cross selling of products, management of regulatory compliance, management of reputational risk, management of financial crime and other operational spheres (Srivastava & Gopalkrishnanb, 2015).

Data collections from banks is constantly done from different areas which include front end which is information on trading, middle which is data on operations and back end which is financial data. The collected information is used for processes like Anti-Money Laundering-Know Your Customer (AML-KYC) compliance, risk management and underwriting, credit scoring, collections and recovery, customer service, asset securitization, capital markets activities, middle-and back-office reporting, trade processing, and bank system connectivity (Somal HK, 2017). As time elapse quality of data on customers' decays, this is because of

constant and sometime drastic change in clients and business data (Insight Ecosystems, 2009). Some of the benefits offered by Big Data are the ability to understand the root cause of failures as they happen, and fully understanding the advantage of campaigns driven by data, generation of customer offers depending on what they prefer, risk portfolio reevaluation, increase in engagement of clients, loyalty and customer experience personalization (Somal HK, 2017).

The banking industry in Kenya has experienced several challenges from the year 1986 and cumulatively through to 1998, there were a total of 37 bank failures (Kithinji & Waweru, 2007; Ngugi, 2001). The most recent bank failures were observed in 2015 with the collapse of Dubai Bank, Imperial Bank and Chase Bank collapsed. Based on reports provided by Centre for Corporate Governance, (2014) some of the factors that led to failures of the banks were: poor strategies for managing risks, conflict of interest and insider lending, absence of internal controls, poor practices for corporate governance and weak regulatory as well as supervisory system. Challenges of transparency and disclosure also contributed towards banks failure (Brownbridge, 2017).

1.2 Statement of the Problem

Growth and stability of the economy greatly depends on the how strong the banking system is. In the financial service industry, banks are the main component that ensures there is stability and growth witnessed in the sector (Koch & McDonald, 2013). Bank managers have not thoroughly assessed risks of the bank or even addressed them efficiently; this is evident with the collapse of three commercial banks in the country, i.e. Chase bank, Imperial bank and Dubai bank (Gathaiya, 2016). The assessment of the banks risks is dependent on the

function of internal audit within the organization. Internal audit findings communicate to the management on the risk facing the bank and advise on the internal control that can mitigate such risk within the organization. Based on various researches, it has been revealed that banking institutions have approximately 25% of incorrect information on Customer Information File/Customer Information System (CIF/CIS). Because of this challenges of poor quality data, bankers have ended up making poor decisions both in strategies and tactics and have resulted in decreased levels of profitability and client loss (Somal HK, 2017).

The role played by internal auditors in any organization is very important through value addition and improved efforts in achievement of objectives. Nonetheless, because of scandals in accounting and corporate governance, effectiveness of the audit functions has been questioned (Allegrini, Melville, Paape & Selim, 2015; Schneider, 2013). Increased cases of fraud observed in the banking industry are attributed to technological advancements and weak internal controls. On the other hand, technological advancement has also made it easier to spot incidences of fraud (Wanyama, 2012). Internal auditors are increasingly finding themselves addressing yesterday's challenges. Hence, most of Internal Audit findings are considered mundane operational issues. It against this background that the study sought to establish the relationship between data quality and internal audit findings of commercial banks in Kenya.

1.3 Objective of the study

1.3.1 General Objective

The general objective of the study was to establish the relationship between data quality and internal audit findings of commercial banks in Kenya

1.3.2 Specific Objectives

With regard to commercial banks of Kenya, the specific objectives of the study were to:

i. Establish the relationship between data accessibility and internal audit findings.
ii. Determine the relationship between data completeness and internal audit findings.
iii. Examine the relationship between data relevance and internal audit findings.

1.4 Research Questions

The study sought to answer the following research questions

i. What is the relationship between data accessibility and internal audit findings of commercial banks in Kenya?
ii. To what extent does data completeness impact internal audit findings of commercial banks in Kenya?
iii. Does data relevance influence internal audit findings of commercial banks in Kenya?

1.5 Significance of the Study

The findings of the study will be of great significance to management of commercial banks in Kenya as they were enlightened on how data quality affect the internal audit findings, this can assist them in putting strategies in place to enhance data quality as this assist in

generating value adding internal auditing findings. This can also assist in decision making within the banking institutions.

The study findings will be of great importance to policy makers as they would understand how data quality affects internal audit findings in the banking industry, this may help in design policies aimed at enhancing data quality. This can also ensure the quality of audit findings in organizations.

The study will be of importance to future scholars and academicians. It enhanced the understanding on how data quality affects the internal audit findings. Further, it may form the basis for future study, the study may also add to the body of knowledge on data quality and internal audit findings, in relation to the agency theory.

1.6 Scope of the Study

The study was conducted in commercial banks in Kenya. It targeted Chief Internal Auditors (CIAs) and their direct reports, of the 42 commercial banks in Kenya, situated at their head office in Nairobi.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the existing literature on the relationship between data accessibility, data completeness, data relevance and internal audit findings of commercial banks in Kenya. The chapter specifically covers the theoretical literature review, empirical literature review, research gaps and the conceptual framework.

2.2 Theoretical review

The study was based on agency theory.

2.2.1 Agency Theory

This theory was developed by Meckling and Jensen (1976). According to the theory the agency association is a form of contract whereby one or more individuals (the principal(s) engages with other individuals (the agent) for the purpose of performing particular services on their behalf and this includes the delegation of authority to make decisions to agents. Jensen (2000) explained that there is divergence that exists between decisions of agents and the decisions that would maximize principles welfare. In this association with principle agents, the interest of owners is to maximize share value while the interest of managers is to grow the company and privately consuming the resources of the company.

In this agency theory, the underlying model is that of 'man's model' which indicates that a rational actor tries to optimize on their utility while incurring the least possible expenditure. The intention of principles and agents is to attain maximum utility while incurring minimum expenses. Therefore whenever an agent or principle is presented with two options they are

likely to select the option that will maximize on their personal utility (Millichamp & Taylor, 2008). Eisenhardt (1989) explained that principles tend to be less averse to risk than agents. An agent who lacks the ability of diversifying their employment will tend to be risk averse while principles with the ability to diverse their investment are more likely to be neutral towards risk.

The agency theory is critiqued in that it assumes that behaviour and consequences are relatively homogeneous and easily controlled, which is not true in the real world. In a complex network of dyadic relations for example, the simplicity of the dichotomous choice between the monitoring and the proposal of incentives to regulate the conduct or outcome is not effective. Also, to stay guarded against opportunistic behaviour can lead to stifled initiatives, creativity, entrepreneurship and innovation in companies, a cost that is often ignored by agency theorists (Davis, 1997).

An auditor has the responsibility of assessing whether preparation of financial statements by agents is fair and true and whether its preparation is done in line with the overall principles of accounting. Through this audited financial statements the management of the organization is held accountable to shareholders for their management of the organization. Engagement of auditors is as agents and is on contractual basis and is independent of agents managing business operations. In this context, the key role of audited accounts is for accountability purposes and also audit helps in reinforcing trust and in promoting stability.

The principal has the responsibility of providing quality data to the agents to ensure quality audit results. Audit effectiveness is achieved by collecting substantial and relevant audit

evidence to provide a fair judgement on the financial data in compliance with the Generally Accepted Accounting Principles (GAAP). Audit effectiveness helps firms accomplish their objectives through the process of systematically approaching and evaluating control and governance processes and the management of risk in a disciplined approach so as to improve its effectiveness. It also enhances responsibility that employees and executive directors have towards stakeholders and owners (Eighme & Cashell, 2012). Effective analysis of data must lie at the heart of internal audits if they are to remain relevant to stakeholders (Neogy, 2014).

This theory helps in explaining the relationship between of data quality and internal audit findings of commercial banks in Kenya. The theory was also adopted by Mweti (2016) in explaining the effect of internal audit functions and the level of financial fraud in Banks and Amoh (2017) to analyse the effects of internal audit quality on Firms listed at NSE.

2.3 Empirical Review

This section reviews literature on the relationship between data quality and internal audit findings as follows;

2.3.1 Data Accessibility and the Internal Audit Findings

In order for internal auditors to accomplish their wok in an effective manner, they should have a free access to information needed. Muliawan, (2015) did an investigation on the effect of direct accessibility on usage of generalized audit software (gas) and quality of analytical tests by auditors. In order to determine the actual quality of data, the researcher used empirical evidence on ways in which accessing organizational information affected the quality of analytical tests by auditors. To answer the research problem, a mixed approach

technique was embraced whereby surveys as well as interviews were applied for data collection. Secondary information from literature on IT auditing was used to boost the research discussion. The findings showed that there was a moderate and significant effect of direct and indirect access to organizations information on levels of auditors' professional scepticism and ability of focusing on GAS interactions. The results showed that when auditors have direct access to organization's information their levels of professional scepticism increases while their focusing ability on interactions decreases. In addition, direct access didn't have any variation that was statistical significant regarding the quality of auditors' analytical tests (Muliawan, 2015). Muliawan study has explained the importance of direct access of data by internal auditors. Direct data access would simplify auditor's work as their will be minimal consultations hence improving internal audit findings.

Fonseca, Vieira and Madeira (2008) did a study on online detection of malicious data access using database management systems auditing. The proposition of the study was a mechanism allowing the access to malicious information to be detected concurrently via Database Management Systems (DBMS) by conducting an online analysis. In this technique, directed graphs are used where transactions are monitored and unauthorized access to information is detected using the Structured Query Language (SQL) commands. Proposition of this study was the use of an algorithm having the ability of learning graphs that represent users profile. The technique can be applied in protecting traditional database applications from being attached and also applications that are web-based from being attached through the SQL injection. This technique being proposed is generic and can be applied in majority of

commercial DBMS, which adds to already existing techniques for detecting malicious access to information (Fonseca, Vieira & Madeira, 2008). Data security will ensure that the information is not be accessed by individuals who have self-interests and may alter the information. Only authorized individuals such as the internal auditors will have access to the data and especially during the auditing period. This will ensure the reliability of the internal audit findings.

Data Quality City of York (2015/16) conducted an audit. The purpose of the audit was to provide assurance to management that procedures and controls within the system ensure that: datasets provided are complete, accurate and relevant for the calculation of the indicator, data is correctly processed in order to calculate the indicator and the data gathering process for each indicator was understood and reviews were undertaken of the final output figures to confirm their accuracy. Provision of complete, accurate and relevant data to the auditors will ensure an accurate analysis of the organization financial statements by the auditors. This will improve the accuracy of internal audit.

2.3.2 Data Completeness and the Internal Audit Findings

Overman and Clarke (2014) noted that the pillar to any database is accurate and complete information. In order for an organization to make sure that it has information that is of great quality, they should conduct a verification process that is rigorous, transparent and objective. If they lack such processes, then the information they have cannot be relied on for the purpose of properly informing users and participants of the information. Information pertaining outcomes plays a very important role in the process of decision making and

therefore affects the quality of care, reputation, policies on health care, reimbursement, etc. The importance of having a robust process of data verification is underscored by these developments. There are a number of ways that can be used in verifying information and they include physical visits to the site, and document verification from the remote source. One key development is e introduction of the central statistical verification method that provides real time monitoring. The approach of verifying information has the ability to significantly better the quantity and quality of information and also lower the effect of resource utilization on users as well as the database (Overman & Clarke, 2014). From this study data completeness improves the quality of data to be used for auditing.

Schroeder (2016) evaluated the impact of audit completeness and quality on earnings announcement GAAP disclosures. This study examined the role of the external audit in management's decision about the amount of GAAP financial statement information to disclose in the annual earnings announcement. The earnings announcement is a key disclosure provided by public companies. Yet, there is no requirement that earnings announcements contain audited GAAP numbers; in fact, recent trends indicate that a majority of companies release earnings before the completion of year-end audit fieldwork. The study found that companies that wait until the audit is more complete at the earnings announcement date and receive higher quality audits provide more detailed balance sheet, cash flow statement, and overall GAAP disclosures.

Two approaches can be applied to ensure data completeness. They include monitoring the accuracy and completeness through changes to the report configuration and monitoring the

accuracy and completeness by testing the change management process. Both approaches require that an initial understanding of the report configuration be gained and tested. Tracing transactions from data entry to the report results will test for completeness and accuracy. Re-performing any calculations used to create the report also tests for accuracy. Once a baseline understanding of the report is obtained, one of the two approaches mentioned above are needed to maintain ongoing assurance over completeness and accuracy (Sayag, 2010).

The first approach is used to test the accuracy and completeness of the information. It is a precise approach. This would require management to identify the reports that are 'in-scope' and monitor any potential changes to such reports. If any component of the report were to change, the testing of the completeness and accuracy of the report would need to be re-evaluated. The benefit to this approach is that all fields, configurations & etc. relevant to the creation of the report are monitored for changes whether intended or not. This allows an organization to precisely determine whether changes to a report impact completeness and accuracy (Fish, 2012).

The second approach is used to test the controls over the accuracy and completeness of the information. It is a much broader approach that would rely on the testing of the change management process. It is also the most commonly used by external auditors. To the extent that the change management process was reliable, the assumption is any in scope report would have been subject to the change management process and had its completeness and accuracy re-validated. Organizations should ensure that key reports are going through the

change management process. One challenge with the approach is that there can be unintended false-positives from re-compiling of objects causing a lot of unnecessary audit work (Schauer, 2011).

The first approach is more suitable in the study. This is because accuracy and completeness of data is used in this study as a determinant of data quality. The method is also precise. Complete and accurate data will ensure quality internal audit findings.

2.3.3 Data Relevance and the Internal Audit Findings

For data to be considered relevant, it must logically and sensibly support its findings. When responding to audit objective, information that is relevant is the one that is self-evident and presumes a specific objective that is presented in a form of a question. It is also important to consider the age of the data since old information is considered to lack relevance for current situation. Therefore, relevance has a close relationship with scope of audit work which determine the period of time to be covered. Information is relevant if the association is considered to have logical and sensible association with entire objective of audit in terms of: performance aspect under examination, audit subject, and result elements pertain to the evidence and the time period covered for the issues under audit (Dittenhofer, 2010).

Mungal and Slippers (2015) evaluated the quality of reports by internal auditors. Researchers focus was on exploring audit reports quality and completeness from auditors' perspective. The study was conducted in South African Reserve Bank among bank's committee chairpersons and data was gathered by use of structured questionnaires. Researcher sought

the perception of respondents on internal audit report quality that was provided to them in a routine basis. It was found that not all functions of internal audit presented reports that are appropriately focused and show clarity. Despite the fact that audit committee find internal audit reports to be valuable, there isn't room for improvement. Relevant data provides more accurate audit results as compared to irrelevant data. Irrelevant data subjects the auditors to make more consultations hence the auditing is conducted of a long time. Therefore, relevant data will promote more accurate internal audit findings.

Oussii and Taktak (2018) studied the impact of internal audit function characteristics on the quality of internal control. The targeted population was listed companies in Tunisia where the researcher selected a sample of 59 chief audit executives. In order to assess the relationship existing between the quality of internal control and IAF characteristics, a regression model was used. The results showed that the quality of internal control have a significant and positive relationship with IAF competence, the assurance control level for quality of internal audit, the process of follow up and involvement of audit committee when it comes to the review of results and programs for internal audit. A committee internal audit function will ensure that relevant data is available for auditing purposes hence improving the accuracy of internal audit findings.

Saleh (2010) carried out a study on internal audit, critical success factors and data quality in Indonesian cooperative enterprises. Researchers focus was to determine the factors that contribute towards improved quality of data in accounting information systems (AIS) among

the selected corporate enterprises in Indonesia. The key players in Indonesia's economy are these organizations. Based on analyzed data collected from these organizations, the suggestions given by directors in charge of the internal audit committees is that there is some form of relationship existing between internal auditors role and implementation of success factors with quality of AIS information. There was a greater likelihood that the quality of the organization would be improved by emphasizing on system involvement and the role of management reporting of internal auditors and greater commitment of middle management, and by ensuring stability of AIS and teamwork. Provision of quality data by organizations would improve the internal audit findings.

2.4 Summary of Literature Review and Research Gap

From the journal articles, surveys and reports discussed in the literature review, it was noted that data accessibility saves auditors time because they can easily find the information they want. This helps internal auditors to perform their work efficiently and effectively. Complete data minimizes auditor's consultations with the management which gives the internal auditors ample time to perform their duties and also promotes reliable audit results. Relevant data is free of errors and hence promotes efficiency and accurate audit results.

It is evident that there exists literature on internal audit and performance of banks. However, the studies have been concentrated on the independence and objectivity of internal audit. The current study sought to fill the contextual gap by establishing the relationship between data quality and internal audit findings of commercial banks in Kenya

The second research gap relates to the geographical coverage, Srivastava & Gopalkrishnanb (2015) researched on the Impact of Big Data Analytics on Banking Sector in Indian Banks,

while Omar (2017) did a study on the impact of internal audit on the quality of accounting information in Jordanian commercial banks. There is minimal research conducted on data quality of Commercial Banks in Kenya. This study seeks to make academic contribution to the research on data quality of commercial banks and its relationship with the internal audit findings.

2.5 Conceptual Framework

This section defines the study variables that form the conceptual framework under which the study is undertaken. Figure 2.1 is a representation of the variables explored by this study.

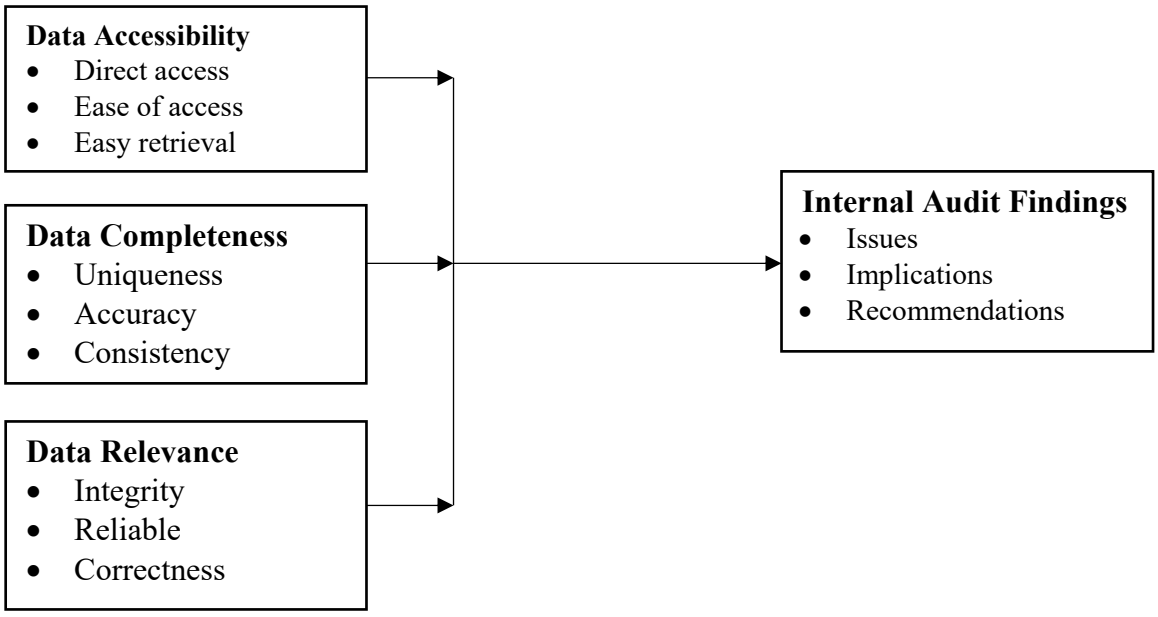

Figure 2.1: Conceptual Framework

Data accessibility refers to software and activities related to storing, retrieving, or acting on data housed in a database. Easily accessible data builds a data-informed culture hence enhancing internal audit findings. Data completeness refers to an indication of whether or not

all the data necessary to meet the current and future audit needs are available in the data resource. Complete data is accurate and consistent. Data with the mentioned features enhances internal audit findings. Data relevance is the level of consistency between the data content and the area of interest of the user. Relevant data is corrected hence reliable and it enhances internal audit findings. For the purposes of this study, these factors were operationalized as shown in Table 2.1 below

Table 2.1: Operationalization of Variables

Multiple regression analysis will be conducted to determine the relationship between data quality and internal audit findings of commercial banks in Kenya**.**

Objectives	**Type of Variable**	**Indicators**	**Scale of measurement**
To establish the relationship between data accessibility and internal audit findings of commercial banks in Kenya	Data Accessibility (**Independent Variable**)	• Direct access • Ease of access	Ordinal scale
To determine the relationship between data completeness and internal audit findings of commercial banks in Kenya	Data Completeness (**Independent Variable**)	• Uniqueness • Accuracy • Consistency	Ordinal scale
To examine the relationship between data relevance and internal audit findings of commercial banks in Kenya	Data Relevance (**Independent Variable**)	• Integrity • Reliable • Correctness	Ordinal scale
	Internal Audit Findings (**Dependent Variable**)	• Issues • Implications • Recommendations	Ordinal scale

Source: (Researcher, 2019)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research methodology used to answer the research problem. It highlights the research design, target population, sampling technique, data collection instruments, data analysis and presentation and ethical consideration.

3.2 Research Design

The study adopted a cross sectional descriptive research design. According to Cooper and Schindler (2008); Saunders, Lewis and Thornhill (2012), a descriptive research collects information directly from the population being investigated and this helps the researcher get the descriptive existing phenomena through questions regarding attitude, value, behavior and perception (Polit & Beck, 2004). A descriptive cross-sectional study is a study in which the condition and potentially related factors are measured at a specific point in time for a defined population (Ngechu, 2004). Moreover, it explores the existing status of two or more variables at a given position in time and whether a relationship exists between them (Creswell, 2013; Kothari, 2004); hence most suited in establishing the relationship between data quality and internal audit findings of commercial banks in Kenya.

3.3 Population

A target population refers to the entire group of elements or objects that are of interest to the researcher and are studied for the purpose of generalizing the conclusions. Based on 2017's banks supervision report, there are 42 commercial banks in Kenya and are listed in Appendix 2. These commercial banks are groups into three tiers with tier 1 comprising of 6 banks and

they cumulatively control 54.32% of the market. Tier II has fifteen banks and cumulatively control 39.40% of the market and lastly tier III comprises of 21 banks and cumulatively control 6.28% of the market. The study targeted 2 respondents from each of Tier 1 banks, 1 respondent from each of the medium (Tier 2) commercial banks and 6 respondents from the small (Tier 3) commercial banks. This ensured that banks at all levels participate in the study so that a comparison can be made on the results of the different bank levels. The target population was senior internal auditors.

3.4 Sampling Procedure

Sampling is the method used in selecting a representative population from the target population. The unit of analysis was commercial banks of Kenya while the unit of observation was the senior internal auditors (CIA and their direct reports) in commercial banks. The total population of senior internal auditors in commercial banks of Kenya is unknown; hence purposive sampling was used in selecting 12 respondents from the Tier 1 banks, 15 respondents from the medium (Tier 2) commercial banks and 6 respondents from the small (Tier 3) commercial banks forming a target sample of 33 respondents. The sample is an estimated figure from Central Bank of Kenya Report 2018. The target population was divided into strata and a sample was selected from each of the groups to form a sample. The sample is reflective of the market size index of Tier 1, 2 and 3 banks respectively.

Table 3.1: Sample Size

Type of firm	Number of targeted respondents
Large (Tier 1)	12
Medium (Tier 2)	15
Small (Tier 3)	6
Total	**33**

Source: Central Bank of Kenya (2018)

3.5 Data Collection Instruments

The study used questionnaires to collect primary data. The questionnaires were semi-structured. The questionnaire covered data quality on internal audit findings. Likert scale type questions were used. In this study the Likert Scale used was a five-point scale showing the respondents level of agreement with various statements.

3.6 Data Collection procedure

Data was collected from senior internal auditors in commercial banks in Kenya. This constitutes the CIA and their direct report. Trained research assistants were employed to help in the process of data collection. The researcher was available to clarify any issues on the questionnaires during data collection. The respondents were allowed particular time frame to fill and return the questionnaire. After the respondents had completed filling the questionnaire, they were collected by research assistants; this was done to facilitate a greater response rate.

3.7 Research Quality

3.7.1 Validity of the Research Instrument

The meaningfulness and accuracy of conclusions made based on information collected from a research is what is referred to as validity. Validity of the research instrument was determined through content validity. In this study the researcher sought experts' opinion who in this case were lecturers in business school and project supervisors in addition to literature reviewed. This was done to facilitate editing modification of the questionnaire before being used in actual data collection to enhance validity. The questionnaire was revised before data collection.

3.7.2 Reliability of the Research Instrument

Reliability is the extent to which the findings from a study can be replicated by another inquirer. Through reliability test, the researcher is able to determine any ambiguity in data collection tool and data inadequacy; reliability can be said to be trustworthiness, dependability and consistency of a test. The researcher administered questionnaires to respondents selected from target population and the data collected was subjected to the test-retest technique. Tests were repeated at intervals of one week. To obtain reliability coefficient, the scores from each test were correlated. To determine reliability of the instruments, Cronbach's alpha was used. The Cronbach alpha values ranges between 0 and 1 with a greater value suggesting greater reliability. A Cronbach Alpha co-efficient of 0.7 and above suggests that the instrument has good reliability (Cronbach, 2000).

The study computed reliability analysis to test consistency of the questionnaire and it was assessed using test-retest reliability method. The study used Cronbach's alpha to test how reliable coefficients of the research instrument are. The value of alpha ranges between 0 and 1 and as the value increases it implies that it is more reliable and according to Cronbach, (2000) Cronbach Alpha co-efficient of 0.7 or higher indicates a good reliability. From the findings presented in Table 3.2, data accessibility (0.745), data completeness (0.773), data relevance (0.802), and internal audit findings (0.791), all the variables had Cronbach alpha value greater than 0.7 which is an indication that all measures of each variable were reliable and therefore all measures were included in the study.

Table 3.2: Reliability Analysis

Scale	Cronbach's Alpha	N of Items
Data accessibility	**0.745**	**7**
Data completeness	**0.773**	**9**
Data relevance	**0.802**	**9**
Internal audit findings	**0.791**	**7**

3.8 Data Analysis and presentation

The collected data was analyzed with using MS excel and SPSS version 21.0. Descriptive statistics such as frequencies, percentages, means and other central tendencies was used in analyzing quantitative data. The findings were presented using tables, graphs and pie charts. Inferential statistics which include the correlation and regression analysis were conducted to determine the relationship between the study variables. Correlation analysis helps in determining the level of significance between the study variable

Multiple regression analysis was conducted to determine the relationship between data quality and internal audit findings of commercial banks in Kenya. The study obtained linear regression results for each variable

The regression equations:

$Y = \beta_0 + \beta_1 X_1 + \varepsilon$ ……. ……. i

$Y = \beta_0 + \beta_2 X_2 + \varepsilon$ …….ii

$Y = \beta_0 + \beta_3 X_3 + \varepsilon$ ……..iii

The overall model was $Y = \beta o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Where Y = Internal Audit Findings

X1 = Data Accessibility

X2 = Data Completeness

X3 = Data Relevance

Further, β1, β2 and β3 = Regression Coefficients, β_0 = Constant and ε = Error term

The study sought to establish the following:

β1: Data accessibility has a positive relationship with internal audit findings of commercial banks in Kenya

β2: Data completeness has a positive relationship with internal audit findings of commercial banks in Kenya

β3: Data relevance has a positive relationship with internal audit findings of commercial banks in Kenya

3.9 Ethical Consideration

The main purpose of ethics is to make sure that the research activity does not harm anyone. Also, ethical considerations and requirements helped safeguard the sensitive association that usually exists between the researcher and the respondents. The information collected was therefore handled confidentially and was used solely for academic purposes. To ensure anonymity of the information and protection of respondents' identity, they were not required to indicate their names anywhere.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

In this chapter, the study presents data analysis, discusses the findings of the data analyzed and interprets them. The study analyses the data in line with the objectives of the study. Descriptive and inferential statistics have been used.

4.2 Response Rate

The study targeted 33 respondents and issued them with questionnaires but only 26 were received back. The returned questionnaires represented 78.8% rate of response. According to a rate of response of 50% an above it is good for analysis and making report, and if it is 70% and above it is excellent (Mugenda & Mugenda, 2013). Therefore response rate of 26 out of 33 is excellent.

Table 4.1: Rate of Response

Category	Frequency	Percent
Response	26	78.8
Non-Response	7	21.2
Total	**33**	**100.0**

4.3 Profile of Respondents

4.3.1 Period of Service in the Organization

The respondents were asked to indicate the period they have been working in the organization. Results were as shown in figure 4.1. According the findings 50% of the respondents had worked in the organization for a period between 6-10 years, 31% indicated

that they had worked in the organization for 11 years and above, while 19% indicated that they had worked in the organization for a period between 1-5 years. This implies that the respondents had worked in the organization long enough to provide information needed for the study.

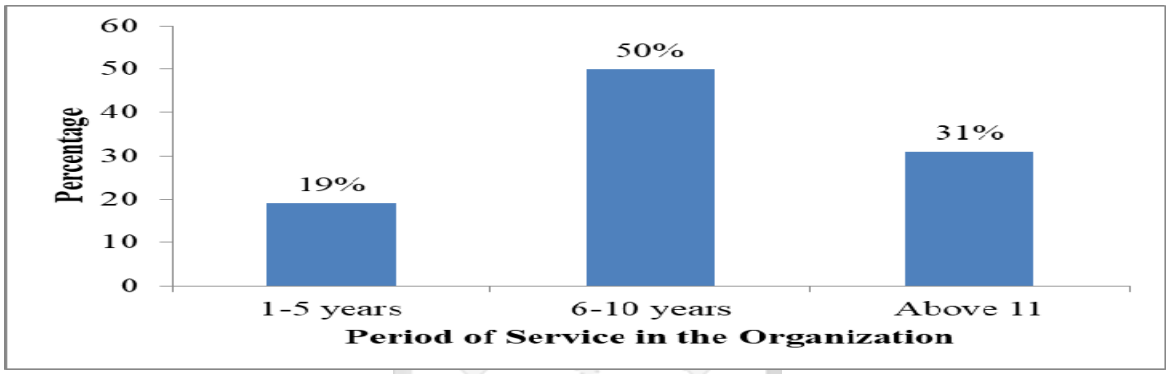

Figure 4.1: Period of Service in the Organization

4.3.2 Highest Level of Education

The respondents were asked to indicate their highest level of education. Findings are a shown in figure 4.2. From the findings 42% of the respondent's highest level of education was masters, 35% highest level of education was degree and 23% highest level of education was PhD.

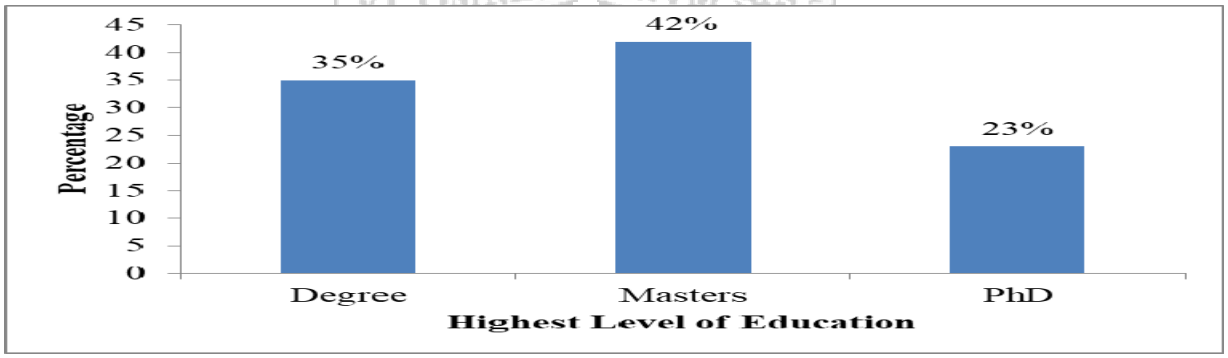

Figure 4.2: Highest Level of Education

4.4 Descriptive Statistics

In this section, the study presents the findings on various statements that relate with the study's objectives. The respondents were asked to indicate their level of agreement using a 5-point Likert scale where; 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5 =Strongly Agree.

Mean is a measure of central tendency, it tries to show where the opinion of majority of respondent is. In the Likert scale, if the mean is between 1 to 1.49, it is interpreted in relation to the one given a scale of 1 in the Likert scale that is strongly disagree , if the mean is between 1.5 to 2.49, it is interpreted in relation to the one given a scale of 2 in the Likert scale that is disagree , if the mean is between 2.5 to 3.49, it is interpreted in relation to the one given a scale of 3 in the Likert scale that is moderate , if the mean is between 3.5 to 4.49, it is interpreted in relation to the one given a scale of 4 in the Likert scale that is agree and if the if the mean is between 4.5 to 5 , it is interpreted in relation to the one given a scale of 5 in the Likert scale that is strongly agree.

Standard deviation is measure of variation, it shows variation in respondent opinion, if the standard deviation is greater than one it is a high standard deviation which means that respondent had differing opinion, if the standard deviation is less than 1 it is a low standard deviation an indication that respondent had similar opinion. For questions that were not assessed through the use of Likert scales, analysis was done by read-throughs.

4.4.1 Data Accessibility and the Internal Audit Findings

Respondents indicated their level of agreement with statements on the relationship between data accessibility and internal audit findings of commercial banks in Kenya. The results were as presented in Table 4.2.

Table 4.2: Data Accessibility and the Internal Audit Findings

	N	Min.	Max.	Mean	Std. Deviation
Direct access					
Data is stored in a central place	26	1.00	5.00	3.1154	1.03255
Only the authorised persons can access the data	26	2.00	5.00	4.2692	.72430
Data is protected from using passwords	26	1.00	5.00	2.9615	.95836
Ease of Retrieval					
Data can be shared very easily due to centralized system	26	2.00	5.00	3.8462	.83390
I know where to go to access data	26	2.00	4.00	2.9231	.74421
Ease of access					
There are minimal procedures in accessing data	26	2.00	4.00	3.6154	.63730
I am able to order data (data mining)	26	2.00	5.00	3.2692	.77757

Regarding Direct Access, the findings revealed that banks only allow authorized persons to have access to important organization data, internal auditors indicated that some banks store their data in a central place while others do not have a central storage and most of the banks have not protected their important data using passwords. In regard to ease of retrieval, the findings revealed that it is easier to share data that is stored in a central system. Moreover, the internal auditors are not always aware of where to access data to be used for auditing. Regarding ease of access it was established that the procedures adopted for accessing data are

minimal so internal auditors can perform their work effectively. However, the internal auditor's power to order data is restricted; this may have an adverse effect on internal audit findings.

These findings are in agreement with Muliawan, (2015) who explained the importance of direct access of data by internal auditors; direct data access would simplify auditor's work as their will be minimal consultations hence improving internal audit findings. Fonseca, Vieira and Madeira, (2008) indicated that data security will ensure that the information is not accessed by individuals who have self-interests and may alter the information. Only authorized individuals should have access to the data, especially during the auditing period; this ensures the reliability of the internal audit findings.

Respondents gave varying reasons on other factors influencing the relationship between data accessibility and internal audit findings such as: System incompatibility, which brings about inconsistent data, lack of a central data warehouse, reliance on ICT to extract data and excessive bureaucracy in obtaining approval to access the data warehouse.

4.4.2 Data Completeness and the Internal Audit Findings

Table 4.3 presents respondents opinion on various statements on effects data completeness on internal audit findings of commercial banks in Kenya.

Table 4.3: Data Completeness and the Internal Audit Findings

	N	Min.	Max.	Mean	Std. Deviation
Uniqueness					
I am able to check completeness of data using basic data analytical tools like excel	26	3.00	5.00	4.1154	.43146
There are no data duplicates reported	26	1.00	4.00	3.2308	.86291
Risk of accessing outdated information is minimized due to the availability of unique data	26	1.00	5.00	3.5385	.85934
Accuracy					
Data retrieved contains adequate information needed for auditing	26	2.00	5.00	4.0385	.59872
Data conveys the correct message about the organization	26	2.00	5.00	3.8846	.65280
The Bank's management provides a transparent verification process in establishing accuracy of audit data	26	2.00	4.00	3.6538	.56159
Consistency					
Internal Audit schedules audits to monitor the source data quality	26	2.00	5.00	3.4231	1.10175
Our Bank's input data controls are very effective	26	2.00	5.00	3.6923	.73589
Our Bank's input data controls are very reliable	26	2.00	5.00	3.7692	.81524

In regard to uniqueness, the findings of the study showed that the internal auditors can check if the data they are using in auditing is complete using basic analytical tools like excel, this would improve data completeness. The study also found that there are minimal chances of using outdated data for internal auditing since due to the availability of unique data. Moreover, the case of data duplication is uncertain. The findings also established that most of

the data retrieved can be used for auditing since it has most of the needed information. In most cases the retrieved data gives a true picture about the organization. Most of the banks managers also allow a transparent verification process to establish whether the data is accurate. It was also revealed that the method used by banks to control their data is effective and reliable. However, few banks have put in place internal auditors schedules audits to monitor the source of data.

These findings agree with Overman and Clarke (2014) who noted that the pillar to any database is accurate and complete information. In order for an organization to make sure that it has information that is of great quality, they should conduct a verification process that is rigorous, transparent and objective. If they lack such processes, then the information they have cannot be relied on for the purpose of properly informing users and participants of the information.

Findings of the study indicate other factors that affect completeness of data, which include: Banks's data input controls, data validation process and the Bank's system compatibility. The findings agree with Overman and Clarke (2014), who stated that the approach of verifying information has the ability to significantly better the quantity and quality of information and also lower the effect of resource utilization on users as well as the database.

4.4.3 Data Relevance and the Internal Audit Findings

Table 4.4 presents respondents opinion on statements relating with the effect of data relevance on internal audit findings of commercial banks in Kenya.

Table 4.4: Data Relevance and the Internal Audit Findings

	N	Min.	Max.	Mean	Std. Deviation
Integrity					
Data is free from error hence can be easily analyzed by auditors	26	2.00	5.00	3.3462	.79711
Data is recorded exactly as intended	26	2.00	4.00	3.2308	.58704
Data is easily reproduced	26	2.00	4.00	3.3846	.80384
Reliable					
Data is aligned with the expected audit need/requirement	26	2.00	5.00	3.4231	.70274
Data conforms with the relevant regulatory standards	26	2.00	5.00	3.4231	.70274
Data provided is timely (up to date)	26	2.00	5.00	3.5385	.81146
Correctness					
Manual effort required for reconciliation and remediation of data-quality issues	26	2.00	5.00	3.6923	.73589
There is effective communication between Internal Audit and other department on the available audit data	26	2.00	4.00	3.3846	.63730
The auditors may consult on any information they feel it is incorrect	26	4.00	5.00	4.3077	.47068

The study found that in most banks data is not easily reproduced which has led to delays in internal auditing. It was also noted that most of the data has a lot of errors which gives the auditors a hard time to analyse. Moreover, majority of banks do not follow the accounting requirements when recording data. The study also revealed that not all data provided by banks is timely. Further, data is aligned with with the expected audit need/requirement to a

moderate extent. The study also established that not all data conforms to the relevant regulatory standards. However, auditors are allowed to consult on any information they feel it is incorrect. The findings also showed that manual effort is required for reconciliation and remediation of data-quality issues. Moreover, the communication between internal auditors and organization departments may not be effective. This affects the quality of internal audit findings.

These study findings are in agreement with those of Mungal and Slippers (2015) who evaluated the quality of internal audit reports and found that relevant data provides more accurate audit results as compared to irrelevant data. Also, Saleh (2010) carried out a study on internal audit, critical success factors and data quality in Indonesian cooperative enterprises and found that there was a greater likelihood that the quality of the organization would be improved by emphasizing on system involvement and the role of management reporting of internal auditors and greater commitment of middle management, and by ensuring stability of AIS and teamwork. Provision of quality data by organizations would improve the internal audit findings. Other factors affecting association between data relevance and internal audit findings of commercial banks, as per the study results include: auditors understanding and/or experience in the area of review, as data is usually provided in its raw form.

4.4.5 Internal Audit findings of commercial banks in Kenya

Respondents indicated their level of agreement on statements about internal audit findings. The results were as shown in Table 4.5.

Table 4.5: Internal Audit findings of commercial banks in Kenya

	N	Min.	Max.	Mean	Std. Deviation
Issues					
Internal Audit carries out Data Quality/Data Driven audits	26	1.00	5.00	3.8462	.78446
The mistakes identified from audit data are analyzed in the internal audit findings	26	2.00	5.00	3.4615	.90469
Collection and analysis of data a crucial aspect of the Internal Audit strategy	26	2.00	5.00	4.4615	.76057
Internal Audit findings on data, is driven primarily by regulatory compliance needs; no focus on data quality	26	1.00	4.00	2.7692	1.03180
Implications					
Impact of data quality on audits is measured and communicated in the internal audit findings.	26	2.00	5.00	4.0000	.63246
Recommendations					
Suggestions on how to improve organization data is recorded in the internal audit findings	26	2.00	5.00	3.9615	.72004
Data doesn't get enough board and senior management attention (e.g., seen as an IT issue, not considered a business asset)	26	1.00	5.00	2.6923	1.15825

Regarding issues raised by internal audit, the study found that collection and analysis of data is a crucial aspect of the internal audit strategy, for majority of the Internal Auditors. It was also noted that internal auditors carry out data quality/data driven audits. In some instances internal audit findings incorporates errors identified from audit data. The study also found that internal audit findings are not always guided by the regulatory compliance needs since

there are always data quality issues. It was established that the effect of data quality is measured and communicated in the internal audit findings. Moreover, suggestions on how to improve organization data is recorded in the internal audit findings and that data quality issues does get enough board and senior management attention (e.g., seen as an IT issue, not considered a business asset).

These findings are in agreement with Ljubisavljević and Jovanovi (2011) that the internal audit report is prepared as a form of communication between internal audit and the management of the organization additionally, it is established as a crucial guideline to enhance the management of the company and ensure its success. The internal audit report assist the management to take the required actions and make decisions towards compliance, management of risk, systems for internal control and utilization of resources effectively and efficiently, adding value to organizations performance and operations.

4.5 Regression Analysis

The study computed linear regression models to determine how the predictor/independent variables affect the response/dependent variable that is to establish the relationship between data quality and internal audit findings of commercial banks in Kenya. The results were presented in three tables as shown in subsections below.

4.5.1 Regression Analysis for Data Accessibility and Internal Audit Findings

Relationship between, practices of data accessibility and internal audit findings of commercial banks in Kenya.

The model was as follows; $Y = \beta_0 + \beta_1 X_1 + \varepsilon$

Where Y = Internal Audit Findings, X_1 = Data Accessibility

Table 4.6: Beta Coefficients - Data Accessibility

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.506	.236		6.378	.000
	Data Accessibility	.624	.198	.608	3.159	.003

a. Dependent Variable: Internal audit Findings

From the findings presented in Table 4.6, the regression model was as follows;

$Y = 1.506 + 0.624X_1 + \varepsilon$

The regression equation above shows that when the independent variable (Data Accessibility) is held to a constant zero, it significantly (p-value=0.000) influence internal audit findings of commercial banks in Kenya by a constant value of 1.506.

Data accessibility significantly influence internal audit findings of commercial banks in Kenya (β=0.624; p-value=0.003). Data accessibility positively influences internal audit findings of commercial banks in Kenya. Therefore, increasing data accessibility by a single unit will lead to an increase in internal audit findings of commercial banks in Kenya by 0.624 units.

Table 4.7: ANOVA - Data Accessibility

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.316	1	10.316	59.3898	.005[b]
	Residual	4.168	24	.1737		
	Total	**14.484**	**25**			

a. Dependent Variable: Internal audit Findings
b. Predictors: (Constant), Data Accessibility

In order to establish whether the data used in the study was significant, the study computed ANOVA. Significance level selected was 5%. The results show that the p-value for the processed data is 0.005 which implies that the data was ideal for making conclusion because the p-value was less than the selected level of significance i.e. 0.05. The F critical was less than F calculated (4.26 < 59.3898). The F-critical value was obtained from the F distribution table, and since the calculated value was greater than critical value it implied that, data accessibility significantly influenced internal audit findings of commercial banks in Kenya. The relationship was considered to be significant because the significance value in the above table was less than (≤ 0.05).

Table 4.8: Model Summary - Data Accessibility

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.668[a]	.446	.438	.21645

a. Predictors: (Constant), Data Accessibility

Model summary was used to show the variation in internal audit findings of commercial banks in Kenya as a result of change in data accessibility. Correlation coefficient denoted by R shows the relationship between the variables included in the model. If the value obtained is 0 it suggests that the variables are not related and if its 1 there is a perfect relationship between the variables. A value of ±0.5 and above showed that the relationship between the variables was strong. The findings in table 4.8 suggest that there is a strong positive relationship between data accessibility and internal audit findings of commercial banks in Kenya (r= 0.668). The adjusted R^2 indicates that there was 43.8% variation in internal audit

findings of commercial banks in Kenya as a result of change in data accessibility. The remaining 56.2% suggests tat other factors exist that are responsible for changes in internal audit findings of commercial banks in Kenya.

4.5.2 Regression Analysis for Data Completeness and Internal Audit Findings

Relationship between, practices of data completeness and internal audit findings of commercial banks in Kenya.

The model was as follows; $Y = \beta_0 + \beta_2 X_2 + \varepsilon$

Where Y = Internal Audit Findings, X_2 = Data Completeness

Table 4.9: Beta Coefficients - Data Completeness

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.506	.236		6.378	.000
	Data Completeness	.457	.139	.396	3.292	.005

a. Dependent Variable: Internal audit Findings

From the findings presented in Table 4.9, the regression model was as follows;

$Y = 1.506 + 0.457X_1 + \varepsilon$

The regression equation above shows that when the independent variable (Data Completeness) is held to a constant zero, it significantly (p-value=0.000) influence internal audit findings of commercial banks in Kenya by a constant value of 1.506.

Data completeness significantly influence internal audit findings of commercial banks in Kenya (β=0.457; p-value=0.005). Data completeness positively influences internal audit findings of commercial banks in Kenya. Therefore, increasing data completeness by a single

unit will lead to an increase in internal audit findings of commercial banks in Kenya by 0.457 units.

Table 4.10: ANOVA – Data Completeness

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.744	1	8.744	41.2048	.005[b]
	Residual	5.093	24	0.212		
	Total	**13.837**	**25**			

a. Dependent Variable: Internal audit Findings
b. Predictors: (Constant), Data completeness

In order to establish whether the data used in the study was significant, the study computed ANOVA. Significance level selected was 5%. The results show that the p-value for the processed data is 0.005 which implies that the data was ideal for making conclusion because the p-value was less than the selected level of significance i.e. 0.05. The F critical was less than F calculated (4.26 < 41.2048). The F-critical value was obtained from the F distribution table, and since the calculated value was greater than critical value it implied that, data completeness significantly influenced internal audit findings of commercial banks in Kenya. The relationship was considered to be significant because the significance value in the above table was less than (≤ 0.05).

Table 4.11: Model Summary – Data Completeness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.563[a]	.317	.306	.3581

a. Predictors: (Constant), Data completeness

Model summary was used to show the variation in internal audit findings of commercial banks in Kenya as a result of change in data completeness. Correlation coefficient denoted by R shows the relationship between the variables included in the model. If the value obtained is 0 it suggests that the variables are not related and if its 1 there is a perfect relationship between the variables. A value of ±0.5 and above showed that the relationship between the variables was strong. The findings in table 4.11 suggest that there is a strong positive relationship between data completeness and internal audit findings of commercial banks in Kenya (r= 0.563). The adjusted R^2 indicates that there was 30.6% variation in internal audit findings of commercial banks in Kenya as a result of change in data completeness. The remaining 69.4% suggests that other factors exist that are responsible for changes in internal audit findings of commercial banks in Kenya.

4.5.3 Regression Analysis for Data Relevance and Internal Audit Findings

Relationship between, practices of data relevance and internal audit findings of commercial banks in Kenya.

The model was as follows; $Y = \beta_0 + \beta_3 X_3 + \varepsilon$

Where Y = Internal Audit Findings, X_3 = Data Relevance

Table 4.12: Beta Coefficients – Data Relevance

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.506	.236		6.378	.000
	Data Relevance	.664	.147	.540	4.501	.000

a. Dependent Variable: Internal audit Findings

From the findings presented in Table 4.12, the regression model was as follows;

$Y = 1.506 + 0.664X_1 + \varepsilon$

The regression equation above shows that when the independent variable (Data Relevance) is held to a constant zero, it significantly (p-value=0.000) influence internal audit findings of commercial banks in Kenya by a constant value of 1.506.

Data Relevance significantly influence internal audit findings of commercial banks in Kenya (β=0.664; p-value=0.000). Data Relevance positively influences internal audit findings of commercial banks in Kenya. Therefore, increasing data Relevance by a single unit will lead to an increase in internal audit findings of commercial banks in Kenya by 0.664 units.

Table 4.13: ANOVA – Data Relevance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.729	1	9.729	52.875	.005[b]
	Residual	4.412	24	0.184		
	Total	**14.141**	**25**			

a. Dependent Variable: Internal audit Findings
b. Predictors: (Constant), Data completeness

In order to establish whether the data used in the study was significant, the study computed ANOVA. Significance level selected was 5%. The results show that the p-value for the processed data is 0.005 which implies that the data was ideal for making conclusion because the p-value was less than the selected level of significance i.e. 0.05. The F critical was less than F calculated (4.26 < 52875). The F-critical value was obtained from the F distribution table, and since the calculated value was greater than critical value it implied that, data

relevance significantly influenced internal audit findings of commercial banks in Kenya. The relationship was considered to be significant because the significance value in the above table was less than (≤ 0.05).

Table 4.14: Model Summary – Data Relevance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.594[a]	.353	.348	.2480

a. Predictors: (Constant), relevance

Model summary was used to show the variation in internal audit findings of commercial banks in Kenya as a result of change in data relevance. Correlation coefficient denoted by R shows the relationship between the variables included in the model. If the value obtained is 0 it suggests that the variables are not related and if its 1 there is a perfect relationship between the variables. A value of ±0.5 and above showed that the relationship between the variables was strong. The findings in table 4.14 suggest that there is a strong positive relationship between data relevance and internal audit findings of commercial banks in Kenya (r= 0.594). The adjusted R^2 indicates that there was 34.8% variation in internal audit findings of commercial banks in Kenya as a result of change in data relevance. The remaining 65.2% suggests that other factors exist that are responsible for changes in internal audit findings of commercial banks in Kenya.

4.6 Correlation Analysis

Pearson Product Moment Correlation Analysis was used to determine the association of dependent and independent variables. The correlation value ranges between 0 and 1 with

perfect relationship indicated by 1 and values of 0 indicating the variables are not related. A small relationship is indicated by correlation value between ±0.1 to ±0.29, medium is between ±0.3 and ±0.49, and a strong relationship is above ±0.5.

Table 4.15: Correlation

		Internal audit Findings	Data Accessibility	Data Completeness	Data Relevance
Internal audit Findings	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	26			
Data Accessibility	Pearson Correlation	.866**	1		
	Sig. (2-tailed)	.000			
	N	26	26		
Data Completeness	Pearson Correlation	.870**	.469**	1	
	Sig. (2-tailed)	.000	.000		
	N	26	26	26	
Data Relevance	Pearson Correlation	.870**	.373**	.440**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	26	26	26	26

From the findings, data accessibility and internal audit of commercial banks in Kenya had a strong positive relationship (r=0.866, p-value=0.000), data completeness was also found to be strongly and positively associated with internal audit findings of commercial banks in Kenya (r=0.870, p-value=0.000), and finally, data relevance was found to have a strong and positive relationship with internal audit findings of commercial banks in Kenya (r=0.870, p-value=0.000). From the findings, it is evident that data accessibility, data completeness and data relevance strongly and positively influence internal audit findings of commercial banks in Kenya.

4.7 Chapter Summary

The chapter was on data analysis, presentation and interpretation. The study found that data accessibility and internal audit of commercial banks in Kenya had a positive relationship, data completeness had a strong and positive association with internal audit findings of commercial banks in Kenya and data relevance was found to have a strong and positive relationship with internal audit findings of commercial banks in Kenya.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings, conclusions and recommendations are presented in this chapter. The chapter presents the summary of the findings based on the objectives of the study. The chapter also presents the conclusions based on the findings and finally recommendations are made.

5.2 Discussion

This section was presented in line with the objectives of the study which were: to establish the relationship between data accessibility and internal audit findings; to determine the relationship between data completeness and internal audit findings and to examine the relationship between data relevance and internal audit findings.

5.2.1 Data Accessibility and the Internal Audit Findings

The study found that data accessibility significantly influence internal audit findings of commercial banks in Kenya. Basel Committee (2013) states that, inorder to improve banks' ability to aggregate risk data, it is important for pesonnel in charge of risk in the bank to sufficiently access risk data to make sure they are aggregated appropriately, then reconsile and validate the informatio into reports. Study's focus was ascertaining association between data accessibility and internal audit findings of commercial banks in Kenya. Whereas, the study findings established that not all banks store data in a central data warehouse and that Internal Auditor's don't know where to go to access data, impacting the internal auditing findings, the same findings indicate that data can be shared very easily due to centralized

system, there are minimal procedures in accessing data and Internal Auditors of some banks are able to order data (data mining).

Further, results of the study indicate the need for compatibility in the Bank's system and presence of a central data warehouse, as it directly impacts the level of consistency in the data used while auditing. The study results indicate that, an Auditor's reliance on ICT to extract data decreases the validity of the data provided. Excessive bureaucracy, lack of knowledge in data retrieval and data mining, impacts on data accessibility, hence the quality internal audit findings issued.

5.2.2 Data Completeness and the Internal Audit Findings

The study found that data completeness significantly influence internal audit findings of commercial banks in Kenya, this is inline with the agency theory, where the principal has the responsibility of providing quality data to the agents to ensure quality audit results. Whereas, Overman and Clarke (2014) noted that the pillar of any database is complete and accurate information; in instances where such processes do not exist, then reliability of such databases to inform users and participants do not exist, the Basel Committee (2013) noted that in cases where the information existing is not complete, the effect shouldn't be critical on the ability of the bank to effectively manage its risks.

The findings of the study augment with the Basel Committee (2013), where they established the principles for effective risk data aggregation and risk reporting, which constitute data completeness as the fourth principle. The study found that internal audit findings are affected by Internal Auditor's ability to check completeness of data using basic data analytical tools like excel, risk of accessing outdated information is minimized due to the availability of

unique data. With respect to accuracy, the study established that data retrieved from banks contains adequate information needed for auditing, data conveys the correct message about the organization, and Bank's management provides a transparent verification process in establishing accuracy of audit data. The findings further alluded to the need for internal Auditors to schedule audits that monitor the source data, to establish its quality.

5.2.3 Data Relevance and the Internal Audit Findings

The study revealed that data Relevance significantly influence internal audit findings of commercial banks in Kenya. The findings on the correlation between data relevance and internal audit findings established that data integrity, reliability and correctness had a moderate extent of influence on internal audit findings, with a mean score of 3. This is in line with Dittenhofer (2010), who opines that data is relevant if it has a logical and sensible relationship to the overall audit objective. In the case of commercial banks in Kenya, data is relevant if it enables the internal auditor to identify and report the risks in question.

5.2.4 Internal Audit findings of commercial banks in Kenya

The results of the study show that Internal Auditors rely on data quality in determining the Issues identified during audits, their implications and the recommendations made to management. Basel Committee (2013, highlight that accurate internal and external data in banks is key to enable data users identify, assess and mitigate risk and make strategic business decisions. Ljubisavljević and Jovanovi (2011) indicated the internal audit report is prepared as a form of communication between internal audit and the management of the organization additionally, it is established as a crucial guideline to enhance the management of the company and ensure its success. The internal audit report assist the management to

take the required actions and make decisions towards compliance, management of risk, systems for internal control and utilization of resources effectively and efficiently, adding value to organizations performance and operations.

Whereas the results of the study indicate that an Internal Auditor's passion and interest has an impact on the internal audit findings, the respondents further allude that, an Auditor's understanding of the bank models, systems and processes has a greater impact on the internal audit findings. This concurs with Al-Shammari (2010) who indicated that a good audit can be performed when the staff have the experience, education, and training and collectively can administer all that is required by its mandate the entire scope of audits requested by its directive. Eighme and Cashell (2012) also indicated that Audit effectiveness helps firms accomplish their objectives through the process of systematically approaching and evaluating control and governance processes and the management of risk in a disciplined approach so as to improve its effectiveness.

5.3 Conclusions

The first objective of the study was to establish the relationship between data accessibility and internal audit findings. The study found that data accessibility influences internal audit findings of commercial banks in Kenya. The study also found that data accessibility positively influences internal audit findings of commercial banks in Kenya. From the findings the study concludes that data accessibility significantly influence internal audit findings of commercial banks in Kenya.

The second objective of the study was to determine the relationship between data completeness and internal audit findings. From the findings it was found that data completeness significantly influences internal audit findings of commercial banks in Kenya. The study further established that data completeness positively influences internal audit findings of commercial banks in Kenya. From the findings, the study concludes data completeness positively influence internal audit findings of commercial banks in Kenya.

Finally, the third objective of the study was to examine the relationship between data relevance and internal audit findings. The study established that data relevance significantly influence internal audit findings of commercial banks in Kenya. The study also established that data relevance positively influences internal audit findings of commercial banks in Kenya. From the findings, the study concludes data relevance positively influence internal audit findings of commercial banks in Kenya

5.4 Recommendations

The study revealed that data accessibility positively and significantly influence internal audit findings of commercial banks in Kenya. The study therefore recommmends the management of commercial banks in Kenya to ensure that internal auditors can access information directly and easily, this will improve the internal audit findings.

The study also found that auditors face the challange of excessive bureaucracy, it is therefore recommended for the management of banks, to review their data governance policies to ensure that it creates favourable environment for improved performance of internal auditors. Another challenge was lack of expertise in data retrieval and lack of knowledge in data

mining. The study recommends banks management to ensure that they employ experts to help in mining of data and train their employees on data mining; this will increase their access to data and therefore improving the process of internal auditing.

The study revealed that increasing data completeness significantly influence the internal audit findings of commercial banks in Kenya. The study therefore recommends management of the banks to ensure their data is complete through data verification which can be achieved by having on-site visits and remote source document verification. The banks can also make use of central statistical verification techniques using adaptive or triggered monitoring in real time. The banks can also ensure completeness and accuracy of their data by tracing transactions from data entry to the report results.

The study found that data relevance positively influence internal audit findings of commercial banks in Kenya. The study therefore recommends banks management to ensure that the data provided to auditors is reliable and correct, this will improve findigs of internal audit. This can be acheived by the bank ensuring that their information is up to data and free from reduntant information.

5.5 Suggestions for Further Studies

The main objective of the study is to establish the relationship between data quality and internal audit findings of commercial banks in Kenya. The study recommends a study to be conducted on relationship between data quality and external audit findings of commercial banks in Kenya. The study further recommends replication of the research study in micro finance institutions and insurance companies.

BIBLIOGRAPHY

Ahmed, M., Ayasra, A., & Zawaideh, F. (2013). Issues and Problems Related to Data Quality in Ais Implementation, *International Journal of Latest Research in Science and Technology*, 2(2) 17-20.

Allegrini, M., Melville, R., Paape, L. and Selim, G., (2015), 'Special issue on 'internal audit and corporate governance': introduction', *Journal of Management Governance*, 13, p.1-3.

Al-Shammari, A. (2010). *The role of the Audit Committee in Corporate Governance in Saudi Arabia.* In Workshop paper. College of Business Administration-King Saud University, 1-34.

Ballou, D. P., & Pazer, H. L. (1985). Modeling data and process quality in multi-input multi-output information systems. *Management Science,, 31*(2), 150-162.

Basel Committee. (2013, January). Basel Committee on Banking Supervision. *Principles for effective risk data aggregation and risk reporting*.

Cangemi, M. P., & Sinnett, W. M. (2016). *Data Analytics and Financial Compliance: How Technology is Changing Audit and Business Systems.* Financial Executives Research Foundation .

Data Quality City of York Internal Audit Report (2015/16).

DeAngelo, L. (2011), "Auditor size and audit quality", *Journal of Accounting and Economics* 3 (3), 189–199.

Dittenhofer, M. (2010). Internal auditing effectiveness: An expansion of present methods. *Managerial Auditing Journal*, 16(8), 443–450.

Ecosystems, I. (2009). *Data Quaity and Intergration in Banking.* Little Rock: Insight Ecosystems LLC.

Eighme, J. E., & Cashell, J. D. (2012). Internal auditors' roles in overcoming the financial reporting crisis. *Internal Auditing*, 17(6), 3-3.

Fish, K.M. (2012). *Internal Audit's role in the new asset Management era*. New York, Ernest & Young LLP.

Fonseca, J., Vieira, M. & Madeira, H. (2008). *Online Detection of Malicious Data Access Using Database Management Systems Auditing*. Unpublished Thesis, University of Coimbra

Gathaiya, R.N (2016) Analysis of Issues Affecting Collapsed Banks in Kenya From Year 2015 to 2016 IJMBS Vol. 7, Issue 3, July - Sept 2017

Haug, A., Zachariassen, F., & Liempd, D. V. (2011). The costs of poor data quality. *Journal of Industrial Engineering and Management, 4*(2), 168-193.

Hubbard, L. (2010). Audit working papers. URL: http://ezproxy.haaga-helia.fi:-2118/abicomplete/docview/202758956/E1680CE521894154PQ/1? accountid=27436. Accessed: 3rd August 2018.

Hutchinson, M. R., & Zain, M. M. (2014). Internal audit quality, audit committee independence, growth opportunities and firm performance. *Corporate Ownership and Control*, *7*(2), 50-63.

Kothari, C. R. (2008). *Research Methodology, Methods and Techniques* (2nd ed., pp. 109-110). New Delhi: New Age Inter- national (P) Limited.

Levitin AV & Redman TC (2016) Data as a resource: Properties implications and prescriptions, *Sloan Management Review* 40(1): 89-101.

Ljubisavljević, S., & Jovanovi, D. (2011). Empirical research on the internal audit position of companies in Serbia. Economic Annals, LVI (191), 123-141

Matoke, V. N., & Omwenga J. (2016). Audit Quality and Financial Performance of Companies Listed in Nairobi Securities Exchange. *International Journal of Scientific and Research Publications.*

Mburu, J. K. (2017). *In Memory Data Warehousing to Improve on Data Analytics Latency.* Nairobi: University of Nairobi.

Mugenda, O.M. & Mugenda, A.G. (2003) Research Methods, Quantitative and Qualitative Approaches. ACT, Nairobi.

Mungal, S. & Slippers, J. (2015). *Quality of internal audit reports.* Unpublished Thesis, University of Pretoria.

Neogy, T. K. (2014). Evaluation of Efficiency of Accounting Information Systems: A Study on Mobile Telecommunication Companies in Bangladesh, *Global Disclosure of Economics and Business*, 3(1).

Nord, J. H & Xu H (2015). An investigation of the impact of organization size on data quality issues, *Journal of Database Management* 16(3): 58-71.

Oussii, A.A. & Taktak, N.B. (2018). The impact of internal audit function characteristics on internal control quality, *Managerial Auditing Journal*, 33(5), 450-469.

Overman, D.M & Clarke, D. R (2014). Verification of Data Completeness and Accuracy. *Pediatric and Congenital Cardiac Care,* 379-391.

Pickett, S.K.H (2011). The essential guide to internal auditing. 2nd ed. John Wiley & Sons limited. Southern gate, Chichester.

Redman, T. C (2016). The impact of poor data quality on the typical enterprise, *Communications of the ACM* 41(2): 79-82.

Ravi, V., & Kamaruddin, S. (2017). *Big Data Analytics Enabled Smart Financial Services: Opportunities and Challenges.* Hyderabad: Springer International Publishing.

Saleh, F.M.S (2010). *Internal Audit, Critical Success Factors and Data Quality in Indonesian Cooperative Enterprises*. Southern Cross University, Tweed Heads, Australia.

Sayag, A. C. (2010). The Effectiveness of Internal Auditing, *Australian Accounting Review*, 296-304.

Schauer, P. C. (2011). *The effects of auditor size on audit quality: an examination using bid ask spreads*. Paper presented at the Department of Accounting, Bowling Green State University.

Schneider, A., (2013). An examination of whether incentive compensation and stock ownership affect internal auditor objectivity', *Journal of Management Issues*, XV (4), 486-497.

Scully J & Fawcett SE (1993) Comparative logistics and production costs for global manufacturing strategy, *International Journal of Operations & Production Management* 13(12): 62-78.

Singh, R., & Singh, K. (2010). A descriptive classification of causes of data quality problems in data warehousing. *International Journal of Computer Science Issues (IJCSI), 7*(3), 41.

Somal HK. (2017, June). Big Data & Analytics. *Tackling Business Challenges in Banking Industry*.

Srivastava, U., & Gopalkrishnanb, S. (2015). Impact of Big Data Analytics on Banking Sector: Learning for Indian Banks. *2nd International Symposium on Big Data and Cloud Computing (ISBCC'15)* (pp. 643 – 652). Pune: Elsevier B.V.

Thuma, J. (2012). *Practical Approaches to Data Quality Management in Business Intelligence and Performance Management*, Retrieved from http://www.b-eye-network.com/view/11602.

Wanyama, T.S (2012). *Effectiveness of fraud response strategies adopted by Co-operative Bank of Kenya Limited*. Unpublished MBA Project. University of Nairobi

Watts, S., Shankaranarayanan, G., & Even, A. (2009). Data quality assessment in context: A cognitive perspective. *Decision Support Systems, 48*(202-211).

McGilvray, D. (2010) *Executing Data Quality Projects: Ten Steps to Quality Data and Trusted Information*, Beijing: Publishing House of Electronics Industry.

Gantz, J., & Reinsel, D. (2012). *The Digital Universe In 2020: Big Data, Bigger Digital Shadows, and Biggest Growth in the Far East*. Retrieved from the World Wide Web: http://www.emc.com/collateral/analyst

Wenfei, F. (2013). *Querying Big Social Data*. Big Data, 14-28.

Alzeban A, & Gwilliam D. (2014). Factors affecting the internal audit effectiveness: A survey of the Saudi public sector, *J. Int. Account. Audit. Taxat*. 23:74-86.

Appendix I: Introductory Letter

Strathmore Business School

Tuesday, 07th May 2019

To whom it may concern

RE: FACILITATION OF RESEARCH - MARY APONDI

This is to introduce Mary Apondi, who is an MPPM student at Strathmore University Business School, Admission Number – MPPM/86084/14. As part of our Master's program, Mary is expected to do applied research and to undertake a project. This is in partial fulfilment of the requirements of the Master of Public Policy and Management. To this effect, she would like to request for appropriate date from your organization.

Mary is undertaking a research paper on **'THE RELATIONSHIP BETWEEN DATA QUALITY AND INTERNAL AUDIT FINDINGS OF COMMERCIAL BANKS IN KENYA'**. The information obtained from your organization shall be treated confidentially and shall be used for academic purposes only.

Our MPPM seeks to establish links with industry, and one of these ways is by directing out research areas that would be of direct usefulness to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest, if not of practical value to your organization.

We very much appreciate your support and we shall be willing to provide any further information if required.

Regards

Caroline Tiara
Manager – Masters' Programs
Strathmore University Business School

Strathmore UNIVERSITY

Ole Sangale Road, Madaraka Estate
P.O Box 59857 00200 Nairobi, Kenya
Cell: +254 703 414/6/7
Email: info@sbs.ac.ke or Visit www.sbs.strathmore.edu
Twitter:@SBSKenya

Appendix II: Questionnaire

Part A: Profile of Respondents

1. Period of Service in the Organization

   1-5 years [ ]

   6-10 years [ ]

   Above 11 years [ ]

2. Highest Level of Education

   Degree [ ]

   Master's [ ]

   PhD [ ]

Part B: Data Accessibility

3. Indicate your level of agreement on the following statements on the relationship between data accessibility and internal audit findings of commercial banks in Kenya. 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5 =Strongly Agree.

Statement	**1**	**2**	**3**	**4**	**5**
Direct access Data is stored in a central place					
Only the authorised persons can access the data					
Data is protected from using passwords					
Ease of Retrieval Data can be shared very easily due to centralized system					
I know where to go to access data					
Ease of access There are minimal procedures in accessing data					
I am able to order data (data mining)					

We have an effective data management approach such as centralized data base employed					

4. Indicate other factors that impact the relationship between data accessibility and internal audit findings of commercial banks in Kenya?

……

……

Part C: Data Completeness

5. Indicate your level of agreement on the following statements on the relationship between data completeness and internal audit findings of commercial banks in Kenya. 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5 = Strongly Agree.

Statement	**1**	**2**	**3**	**4**	**5**
Uniqueness I am able to check completeness of data using basic data analytical tools like excel					
There are no data duplicates reported					
Risk of accessing outdated information is minimized due to the availability of unique data					
Accuracy Data retrieved contains adequate information needed for auditing					
Data conveys the correct message about the organization					
The Bank's management provides a transparent verification process in establishing accuracy of audit data					
Consistency Internal Audit schedules audits to monitor the source data quality					
Our Bank's input data controls are very effective					
Our Bank's input data controls are very reliable					

6. Indicate other factors that impact the relationship between data completeness and internal audit findings of commercial banks in Kenya?

……

……

Part D: Data Relevance

7. Indicate your level of agreement on the following statements on the relationship between data relevance and internal audit findings of commercial banks in Kenya. 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5 = Strongly Agree.

Statement	**1**	**2**	**3**	**4**	**5**
Integrity Data is free from error hence can be easily analyzed by auditors					
Data is recorded exactly as intended					
Data is easily reproduced					
Reliable Data is aligned with the expected audit need/requirement					
Data conforms with the relevant regulatory standards					
Data provided is timely (up to date)					
Correctness					
Manual effort required for reconciliation and remediation of data-quality issues					
There is effective communication between Internal Audit and other department on the available audit data					
The auditors may consult on any information they feel it is incorrect					

8. Indicate other factors that impact the relationship between data relevance and internal audit findings of commercial banks?

……

……

Part E: Internal Audit findings of commercial banks in Kenya

9. Indicate your level of agreement on the following statements about internal audit findings. 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5 = strongly agree.

Statement	**1**	**2**	**3**	**4**	**5**
Issues Internal Audit carries out Data Quality/Data Driven audits					
The mistakes identified from audit data are analyzed in the internal audit findings					
Collection and analysis of data a crucial aspect of the Internal Audit strategy					
Internal Audit findings on data, is driven primarily by regulatory compliance needs; no focus on data quality					
Implications Impact of data quality on audits is measured and communicated in the internal audit findings.					
Recommendations Suggestions on how to improve organization data is recorded in the internal audit findings					
Data doesn't get enough board and senior management attention (e.g., seen as an IT issue, not considered a business asset)					

THANK YOU

Appendix III: Work Plan

ACTIVITY/MONTH	1	2	3	4	5	6
Proposing topic and writing						
Literature review						
Departmental defence and corrections						
Data collection and analysis						
Compilation, presentation and final project defence						
Review and Submission of the dissertation						

Appendix IV: Banking Sector Market Share – December 2017

	Bank	**Market Size Index**
1	KCB Bank Kenya Ltd	14.14%
2	Co – operative Bank of Kenya Ltd	9.93%
3	Equity Bank Kenya Ltd	9.85%
4	Standard Charted Bank (K) Ltd	7.11%
5	Diamond Trust Bank (K) Ltd	6.72%
6	Barclays Bank of Kenya Ltd	6.57%
	Sub - Total	**54.32%**
1	Commercial Bank of Africa	6.05%
2	Stanbic Bank Kenya Ltd	5.62%
3	I&M Bank Ltd	4.78%
4	NIC Bank Kenya PLC	4.62%
5	Bank of Baroda (K) Ltd	2.56%
6	Citibank N.A. Kenya	2.56%
7	National Bank of Kenya Ltd	2.37%
8	Prime Bank Ltd	2.01%
9	Family Bank Ltd	1.71%
10	Bank of India	1.55%
11	HFC Ltd	1.43%
12	Ecobank Kenya Ltd	1.27%
13	Bank of Africa (K) Ltd	1.25%
14	Guaranty Trust Bank (Kenya) Ltd	0.85%
15	Gulf African Bank Ltd	0.77%
	Subtotal	**39.40%**
1	Victoria Commercial Bank Ltd	0.71%
2	African Banking Corporation Ltd	0.59%
3	Sidian Bank Ltd	0.49%
4	Habib Bank A.G. Zurich	0.45%
5	Guardian Bank Ltd	0.40%
6	First Community Bank Ltd	0.39%
7	Credit Bank Ltd	0.38%
8	Development Bank of Kenya Ltd	0.37%
9	Jamii Bora Bank Ltd	0.35%
10	M – Oriental Commercial Bank Ltd	0.32%
11	Transnational Bank Ltd	0.28%
12	Consolidated Bank of Kenya Ltd	0.26%
13	SBM Bank (Kenya) Ltd	0.25%
14	Paramount Bank Ltd	0.25%
15	Spire Bank Limited	0.23%
16	UBA Kenya Bank Ltd	0.21%
17	Middle East Bank (K) Ltd	0.14%

18	Mayfair Bank Ltd	0.11%
19	DIB Bank Kenta Ltd	0.10%
20	Chase Bank Kenya Ltd**	-
21	Charterhouse Bank Ltd*	-
22	Imperial Bank Ltd**	-
	Subtotal	**6.28%**
	Total	**100%**
**Banks under statutory management*		
***Banks in receivership*		

Source: Central Bank of Kenya: Bank Supervision Annual Report 2017