FINANCIAL INTERMEDIATION EFFICIENCY AND PERFORMANCE OF COMMERCIAL BANKS LISTED ON THE NAIROBI SECURITIES EXCHANGE IN KENYA

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Financial Intermediation Efficiency and Performance of Commercial Banks Listed On the Nairobi Securities Exchange in Kenya

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DECLARATION

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

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DEDICATION

To My Wife and Children, To my friends

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

DEFINITION OF TERMS

Efficiency Ability to produce a result with minimum effort or resources (Kablan, 2010). The effectiveness that yields minimum waste of time, effort and skill.

Financial intermediation efficiency The mobilization of funds from surplus economic units to deficit economic units with minimal or no wastage (Sufian, 2011).

Market informational efficiency The occurrence whereby prices of securities fully replicate available information about a particular security such that there is no other information that could enable investors to earn superior returns to those of the market on average (Brody *et al.*, 2012).

Relative Efficiency This is when on the basis of available evidence, the performances of other DMUs do not show that some of its inputs or outputs can be improved without worsening some of its other inputs or outputs (Cooper, 2004).

Scale efficiency Is the measure of the average productivity at the observed input scale relative to what is attainable at the most productive scale size (Subhash, 1999).

Technical efficiency The ratio of the firms' average production, conditional on its factor inputs and firm effects to the corresponding average production if the firm utilized its level of inputs efficiently (Battese and Coelli 1992)

Return on Assets is the general purpose financial ratio used to measure the relationship of profit earned to the investment in assets required to earn that profit (Lindo 2008).

ABBREVIATIONS AND ACRONYMS

BCC	Banker Charnes Cooper
CCR	Cooper Charnes Rhodes
CRS	Constant Returns to Scale
CIR	Corporate Internet Reporting
CBK	Central Bank of Kenya
COFI	Cost of Financial Intermediation
DEA	Data Envelopment Analysis
DRS	Decreasing Returns to Scale
DMU	Decision Making Unit
EBIT	Earnings Before Interest and Tax
EMH	Efficient Market Hypothesis
ESH	Efficient Structure Hypothesis
FDH	Free Disposable Hull
GDP	Gross Domestic Product
GLS	Generalized Least Squares
IASB	International Accounting Standards Board
IRS	Increasing Returns to Scale
NIM	Net Interest Margin

ROA	Return on Assets
ROE	Return on Equity
TFP	Total Factor Productivity
VRS	Variable Returns to scale

ABSTRACT

Financial Intermediation efficiency is an important component of any successful organization due to the stiff competition in the business environment. For Commercial banks, financial efficiency provides a basis for determining the optimal combination of inputs to produce a given or target level of output. The efficiency of the financial sector therefore supports the stability of the financial system and economic development through elimination of in efficiencies. The study therefore sought to examine the effect of financial intermediation efficiency on the performance of commercial banks in Kenya. The study targeted commercial banks listed on the Nairobi Securities Exchange for the period 2006 to 2017. The dependent variable of the study was performance, measured by the return on assets. The predictor variables were financial management efficiency, corporate governance structural efficiency, financial information efficiency and financial services efficiency. The study adopted the mixed research design, which involved collection and analysis of primary and supported by secondary data to explain the relationships among the variables under investigation. Primary data was collected using structured, closed ended questionnaires. Secondary data was used to corroborate the logical validity of primary data. Secondary data was obtained from published annual financial reports of the banks under study and as used in other related researches. The target study units for this research were all commercial banks listed on the Nairobi Securities Exchange. Statistical analysis was carried out using Statistical Package for Social Sciences software. Further, multiple regression analysis was used for data analysis so as to provide robust result output. The results showed that there is a strong and positive relationship between financial efficiency and performance of commercial banks proxied by return on assets. The study rejects the null hypothesis, and concludes that, there is a significant relationship between financial efficiency and performance of commercial banks in Kenya. The results of this study are of great benefit to various stakeholders including but not limited to bankers, researchers, regulatory authorities and academicians. The study recommends that in order to ensure improved profitability and sustained earnings ability of commercial banks, there is need to concentrate on strategies, geared towards efficiency improvement as a catalyst for better performance. Specifically, bank size, capital adequacy, liquidity risk, leverage and market capitalization are the critical parameters that must be closely watched to ensure improved Technical efficiency. Similarly, corporate governance structures need to be strengthened on aspects of board structure and composition, Transparency, Disclosure and Governance practices. Further, banks need to enhance the efficiency of information provision and service delivery by leveraging on technology. The regulatory authorities should also develop and enforce policy and closely monitor their implementation, on minimum capital requirement and degree of acceptable leverage and risk exposure in the banking sector.

CHAPTER ONE

INTRODUCTION

1.1 Background

The financial system of a country, through financial institutions, plays an increasingly important role in directing financial resources to their most productive use in the economy. It facilitates the making and settlement of financial transactions by linking surplus economic units (savers) and deficit economic units (borrowers). Further, the financial system enables management of risk and uncertainty associated with the transmission of funds in the economy (Bloor and Hunt, 2011). These activities and functions of the financial system are dependent on the efficiency of financial intermediation of the banking sector. An efficient banking sector, in the intermediation function, should show profitability and general performance improvement, increased volume of funds flowing from savers to borrowers and improved quality of services for consumers. Similarly, it should ensure economic acceleration by converting deposits into productive investments (Sufian, 2011). Therefore, it is expected that, a highly efficient banking system leads to economic growth through financial system stability, equitable distribution of resources and increased income per capita, otherwise inefficiency is realized. The need for financial intermediation efficiency is further necessitated by the changes in the competitive business environment, that have led to mergers, acquisitions and closure of some financial institutions. According to Maggi and Rossie (2003), for banks to lower their operational costs, there is need to improve financial intermediation efficiency as opposed to cross border mergers and acquisitions. This is because, financial efficiency involves review and reorganization of the organizations' internal strategies that facilitate conversion of expenses from product development, marketing and sales into revenues.

On the other hand, mergers and acquisitions involves efficient firms acquiring inefficient firms and the difficulty of separating efficiency from ownership and market power. Financial intermediation efficiency in the developed countries, is at an impeccable level for both financial institutions, capital markets as well as the

banking sector. The intermediation efficiency of the banking sector has enabled seamless operations involving channelling funds from surplus economic units to deficit economic units. This means that, banks are able to produce more revenue from a given quantity of assets and to make profit from a given source of revenue, relative to its inputs. The study therefore sought to determine the connection between financial intermediation efficiency and performance of commercial banks listed on the Nairobi Securities Exchange (NSE) measured by return on assets.

Financial intermediation efficiency analysis facilitates the identification and removal of inherent wastages in the banks' operations. As intermediaries, the efficiency of the intermediation function is pertinent for commercial banks, despite the inherent cost implications. To achieve higher and improved financial efficiency, there is need to invest in appropriate infrastructure. For instance, the automation of banking operations and delivery of services & products via electronic platforms requires huge capital outlay yet it enables banks to reduce costs and provide an opportunity to introduce new products and services. The huge capital investment tangentially, affects the cost of products and services offered by the commercial banks. Consequently, Financial Management Efficiency, Corporate Governance Structural Efficiency, Financial Services Efficiency, Financial information efficiency are critical for performance improvement. The study therefore sought to investigate whether financial efficiency drives the performance of the banking sector in Kenya.

Beck (2007), posits that, less developed financial systems are typically characterized by financial intermediation inefficiency, depicted by high overhead costs and interest spreads. Bloor and Hunt (2011), indicate that, the key signs of financial intermediation inefficiency in the banking sector, are high transaction costs, limited and poor quality financial services & products, insensitivity to customer needs and a misallocation of resources in the economy. This inefficient structure, impedes quality service provision, thus affecting the overall bank performance. Financial fraud, an off shoot of failure in the financial intermediation efficiency function in the banking sector, has grown to phenomenal levels in the recent past. Noteworthy, some financial frauds could be internally instigated, while others are random, thus impacting negatively on financial efficiency and performance.

The financial intermediation efficiency of the banking sector, provides support to the functioning of the financial system of a country. It further provides the basis for economic growth and development, by funding other sectors of the economy. The efficiency of the intermediation function of commercial banks, in channeling funds between the surplus income units and deficit income units in the economy is apparent.

Nasieku (2014), evaluated bank efficiency in Kenya. The study did not analyze the influence of intermediation efficiency on performance. Similarly, the study by Kamau (2011), failed to evaluate the effect of financial intermediation efficiency on performance of commercial banks. Choudhry and Jayasekera (2014), emphasised the importance of intermediation efficiency in the banking sector in enhancing performance and market stability. Seelanatha (2010), investigated the impact of financial intermediation efficiency of commercial banks and market structure on performance. The results indicated that banks' performance is dependent on the level of intermediation efficiency and not at all, on market structure.

In connection to this, Omankhanlen (2013), argued that a banking system with enhanced financial intermediation efficiency, positively impacts on the economy, increases the amount of resources intermediated, leads to an innocuous and sound banking system and provides superior benefits to customers with respect to price, service quality and profitability.

The significance of financial intermediation efficiency in banking sector for the economic and financial development of any nation, is therefore highly critical and cannot be overemphasized. An efficient banking sector is necessary for better usage of financial resources as it facilitates reallocation and risk transfer. Therefore, for efficiency in the financial intermediation process to be achieved, banks should be sound, dynamic and effective in identifying the right set of opportunity-based products, have reliable and competent information dissemination mechanisms, be optimal and proficient in sectoral allocation of resources, have well-organized product and service offerings, be competent in financial management and have appropriate corporate governance mechanisms. The efficiency of financial

intermediation remains an important concern in developing countries and developed countries alike, to guarantee the smoothness of the monetary policy transmission process and also to provide, better pricing of products and services to the banking sector customers.

The concept of financial intermediation efficiency, draws interest from a wide range of stakeholders including government regulators, customers, managers, market analysts, and shareholders (Andries and Căpraru, 2014), who separately, have divergent perspectives and goals. For regulators, inefficient financial intermediation is occasioned by inefficient banks, which are risky and have a high risk of failure, thus undermining the economic growth of a country. Therefore, without a sound and properly a functioning banking system, economic growth is difficult to achieve. From the customers' perspective, financial intermediation efficiency leads to efficient banks that can offer better services at affordable cost. Similarly, shareholders view efficient banks as those capable of offering better return on investment and thus create wealth. Bank managers, in a dynamic and competitive business environment, efficient banks will survive and maintain their market share, and inefficient ones will eventually be eliminated. Financial intermediation efficiency is therefore an important phenomenon for various players and stakeholders. To ensure that the financial system is stable and properly functioning, the central bank must deploy its monetary policy. Aikaeli (2008), posits that when monetary policies are effective, then banks are more likely to be efficient. The efficient banks are better able to compete because of their lower operational costs and can 'steal' business away from less efficient banks. Therefore, the relative efficiency of banks is always a matter of grave interest to the regulators, customers, shareholders and managers.

1.1.1 The Global Perspective of Bank Financial Intermediation Efficiency

Financial intermediation efficiency studies, can be cited to a number of jurisdictions across the world. This can be attributed to the important role, the banks as financial intermediaries, play in channelling of savings and allocation of credit in the economy. Sufian (2011), indicate that an efficient banking sector demonstrates

increased profitability, constantly expanding volume of funds flowing from savers to borrowers and improving quality of services to its consumers. Perhaps, this argument provides the basis for studies on financial intermediation efficiency, to determine the optimal utilization of resources to achieve improved performance.

As the banking sector is the engine that drives the economy, its health, through the intermediation function, is key in supporting the economic performance of the country. Gishkori and Ullah (2013), contend that an efficient intermediation process in the banking sector, is key to the achievement of economic development. In this context, financial intermediation efficiency measurement, provides a basis for development of policy to connect the banking sector to economic growth. Diallo (2018), and Cevik et al. (2016), studied bank efficiency in emerging European countries. They indicate that, financial intermediation efficiency of the banking sector influences the cost of intermediation and the overall stability of the financial system. In most developed economies, the financial systems are stable and the cost of financial intermediation are significantly lower, compared to the developing countries. This is supported by the fact that, the level of financial intermediation efficiency and the quality of the financial sector in this countries, is of very high degree, leading to investments that support faster growth (Belke et al., 2016). Wu (2005), examined productivity and efficiency of commercial banks in Australia during 1983-2001, and reported that financial intermediation efficiency increased in times of deregulation. From this dimension, the policies on bank deregulation are a good catalyst for financial intermediation efficiency, which also positively impacts on performance of banks. Loukoianova, (2008), studied the efficiency of and profitability of Japanese banks between 2000-2006. The study targeted cost and revenue efficiency of banks. The results indicate that the performance of the Japanese banking sector experienced a steady improvement in the study period. However, the study found that differences existed within the banking sector with respect to cost and revenue efficiency among commercial banks. This therefore explains the difference in the performance of banks despite them being similar in other aspects such as asset base.

Through financial intermediation efficiency analysis, it is possible to identify areas of potential improvement in the banking sector operations. These include bank consolidation, pooling of resources for asset risk management and cost sharing. In Africa, some studies on financial intermediation efficiency of commercial banks can be cited. Frimpong (2010) examined the relative efficiency of financial intermediation of commercial banks in Ghana during the year 2007, with specific reference to efficiency and profitability. The results showed that only four out of twenty-two banks sampled, were efficient in their intermediation process.

This represents a mere 18%, indicating that the level of inefficiency in the banking sector in Ghana during the period was at 82%. Kablan (2010), showed that commercial banks in Sub-Saharan Africa were generally cost-efficient, but the efficiency was constrained by the high levels of nonperforming loans. The study further recommended that there is need for improvement in the regulatory and credit environments to guarantee improved intermediation efficiency. Chen (2009), examined the intermediation efficiency of commercial banks in Sub-Saharan Africa. The results indicate that banks could save, at least twenty to thirty percent of their operational costs if they operated on the efficiency frontier.

The findings further provide that, foreign banks demonstrated the highest level of financial intermediation efficiency compared to public banks. From this observation, there exist striking differences in technical efficiency of commercial banks, implying that they applied their inputs differently, leading to different efficiency and output levels. In South Africa, Ncube (2009), analysed banking sector efficiency. The main focus of the study was on cost and profit efficiency. The stochastic frontier model was used. The results indicated that over the period of study (2000-2005), the banking sector in South Africa showed significantly improved cost efficiencies. Further, the results also indicated a weak positive link between cost and profit efficiency. Denizer et al. (2000), found that cost efficient banks are also more likely to achieve high levels of profit efficiency, since a competitive environment stimulates banks to become more efficient by reducing operating costs, enhancing overall bank management, improving risk management, and providing new banking products and services.

1.1.2 The Regional perspective of Bank Financial Intermediation Efficiency

Closer, in the Eastern Africa region, a few studies on banking efficiency can be identified. Lotto (2019), studied the factors that influence bank operating efficiency in Tanzania.

The findings showed that bank liquidity and capital adequacy have a positive relationship with bank operating efficiency. He further indicates that bank profitability and operating efficiency are directly related. This results explain the significant impact that bank efficiency holds on performance. Lotto (2019), further intimate that, capital adequacy and liquidity, not only strengthen financial stability by providing a larger capital cushion and bank required liquidity level, but also improve bank operating efficiency by lowering moral hazard between shareholders and debt-holders. Gwahula (2013), evaluated the efficiency of commercial banks in East Africa by employing the Non parametric approach. The results indicated that most of the commercial banks in East Africa were operating under a decreasing return to scale. He cited inefficient utilization of input resources as the reason for the decreasing returns to scale, an attribute of technical inefficiency of the banking sector.

Technical inefficiency implies existence of unutilized capacity and resources with high operating expenditure. In this connection, bank managers can use the excess unutilised capacity and resources and reduction in operating and other costs, to improve their intermediation efficiency and performance. Zawadi (2013), conducted an efficiency analysis of commercial banks in Tanzania. The findings indicate that the intermediation efficiency levels were varied and as such, the banks posted different performance levels.

Hauner and Peiris (2005), investigated the impact of banking reforms in Uganda, and its effect on banking sector competition and intermediation efficiency. The findings showed that the reforms had a positive effect on competition, leading to a rise in the level of efficiency in the sector. Similarly, Cihak and Podpiera (2005), in an expanded study on banking reforms covering the three East African countries; Kenya, Tanzania and Uganda, found that the banking systems were inefficient and

with a limited intermediation role. Other studies on efficiency conducted in the region, include, Tanzania (Aikaeli, 2008) and Namibia (Ikhide, 2008).

The conflicting findings of studies on efficiency in the Eastern Africa Region, provide a strong basis and motivation to carry out further research in this area and in Kenya in particular.

1.1.3 The National Perspective of Bank Financial Intermediation Efficiency

The banking sector in Kenya has experienced steady and phenomenal growth in the recent years. Tough economic conditions notwithstanding, the sector has remained resilient and less vulnerable to external shocks. The sector has produced some decent return on investment, hence becoming a preferred investment segment in the stock market. This performance could be attributed to the level of financial intermediation efficiency in the sector.

A few studies on performance of commercial banks in Kenya can be cited. Ongore (2013), studied the determinants of bank performance in Kenya. The results showed that bank performance, was largely driven by the efficiency of the board and management decisions. The study utilized capital adequacy, liquidity, asset quality and management efficiency ratios which fail to address the aggregate performance of the bank. Further, Bisher (2011) and Githinji (2010) used CAMEL ratios to measure performance. These ratios do not measure the aggregate performance of the bank, but provide individual insights on performance. Miencha et al. (2016), investigated the financial intermediation efficiency with specific reference to technical efficiency of a sample Kenyan commercial banks. The results showed that the degree of technical efficiency was indicating inefficiency in the sector. They explained that the banking sector could be producing at an inefficient scale, below the production possibility frontier, rather than producing along the production frontier. When producing below the production frontier, it indicates high levels of inefficiency due to misallocation of resources.

Kamau (2009), using a sample of 40 commercial banks in Kenya, for the period 1997-2006, analyzed factors that influence efficiency and Productivity of the banking sector.

The findings showed that foreign-owned banks highly influenced the performance of the local banking sector. This result can be attributed to the fact that foreign banks generally bring with them superior know-how and technical capacity, thereby becoming technically efficient in the intermediation process. The foreign banks inflict competitive pressure on domestic banks as they receive liquidity and other support resources from their parent banks because of their access to international markets.

Kamau (2011), found that the intermediation efficiency of commercial banks in Kenya had not fallen below 40 percent in the period of the study. This finding is critical in supporting the impressive performance of the banking sector in Kenya. The findings further showed that, in terms of ownership structure and size, foreign banks were more efficient than local private banks, while local private banks were more efficient than local public banks. Consequently, large size banks were found to be more efficient than medium and small size banks. Notably, the Kenyan banking sector has undergone significant transformation in the past two decades due to a combination of various factors such as globalization, deregulation of financial systems and emergence of financial technological innovations (FinTech) such as mobile phone banking and internet or online banking. This has led to deepening of access to financial services translating to improved economic performance. Ntwiga (2020), showed that FinTech and bank collaboration had a positive influence on intermediation efficiency in the Kenyan banking sector. To support the robust performance, banking sector in Kenya has witnessed strong Corporate governance efficiency. This is a strong and cogent indicator for the high profitability of the sector.

As the focus of this study is on the commercial banks listed on the NSE, the Capital Markets in Kenya is regulated by the Capital Markets Authority (CMA). The CMA was established in 1985, through the CMA Act Cap 485A. The Authority is charged

with the responsibility of regulating and ensuring a fair, efficient and transparent Capital Markets in Kenya.

The Authority also strives to promote integrity and investor confidence in the Market. To achieve this, the mandate of the CMA is outlined in the Act; Licensing and supervising Capital Market Operations, Enforcing and Ensuring compliance of listed entities with both the legal and regulatory requirements, Regulating public offers of securities(Equities & Bonds), Regulating and approving the issuance of other Capital Market Products, Promoting market development through research on new products and services, Reviewing the legal framework to respond to market dynamics, Promoting investor education and public awareness and Protecting investors' interest. In this connection, the CMA in 2016, developed and published the Code of Corporate Governance and Practices for Publicly Listed Companies in Kenya, effectively replacing the Guidelines on Corporate Governance Practices of 2002. This move was retort to the constantly changing business environment, the need to comply with global best practices and to strengthen the management of the firms listed on the NSE. The Code outlines the principles and practices to be adopted by listed firms as part of their operational irreducible minimums. The Code emphasizes on full disclosure in the annual reports of key elements such as executive compensation, to allow the shareholders enforce governance standards of the firm. The code also highlights board diversity, Size, Independence, Age limit of the board members, shareholding, term limits and stewardship among others as the cornerstones to be made an integral part of the firms' operational culture. Adeabah et al (2018), found that that board gender diversity promotes bank efficiency up to a maximum of two female directors on a nine-member board of directors.

They also indicate that Board size improves bank intermediation efficiency while board independence is negatively related to bank efficiency. The findings of their study further showed that, powerful chief executive officers(CEOs) were injurious for bank efficiency and that ownership structure, bank size, bank age and loan-to-deposit ratio are important factors affecting bank efficiency. Smaller boards have better monitoring abilities, lesser communication challenges and thus associated with prompt decision making. According to Gambo et al. (2018), smaller boards are more

effective than larger boards. They further indicate that board size is negatively related to performance, for consumer goods listed companies in Nigeria. The study further finds that board composition is positively related to performance while board meetings have a negative but insignificant influence on performance. This view is also held in Bushman et al. (2004), who find that large boards are ineffective in monitoring, due to communication breakdown, inefficiency and potential free riding by some board members. Sanda et al. (2010) found that there is a positive relationship between firm value and a small board as opposed to a large board of directors. To improve its monitoring capability, the board of directors ought to be independent. Koh et al. (2007), independence is achieved where there is a higher proportion of independent Directors on the Board. Independent directors are effective monitors because they do not have financial and/or other interests in the firm or connections to top management.

From the Agency theory conjecture, there may arise conflict of interest, where the role of the Chief Executive Officer(CEO) and that of the Chairman are not separated. Where a single individual performs both roles, there will be high likelihood of managerial alignment with the board, rather than with shareholders, leading to managerial dominance (Azim, 2012). Managerial dominance and control over the board, reduces the board's independence and decisions making, thus the CEO/Chairman advances their own interests, thus putting the interests of the shareholders at risk.

Azim (2012), posit that the number of board meetings influences the boards' monitoring ability. There are two main perspectives, where the number of meetings may be too few or the number of meetings maybe too many. According to Kang et al. (2007), too few meetings may indicate that the directors are not paying proper attention to the company while too many meetings may indicate that there are some problems and difficulties the firm is facing. A high frequency of board meetings however, ensures that boards are able to diligently and effectively discharge their mandate and thus enhance the oversight function (Yatim et al., 2006). Board meetings are therefore an important corporate governance mechanism that drives bank performance.

As at 31st December, 2017, the banking sector in Kenya comprised 43 banking institutions made up of 43 commercial banks and 1 mortgage finance company, 13 microfinance banks, 9 representative offices of foreign banks, 19 money remittance providers, 73 foreign exchange bureaus and 3 credit reference Bureaus. Of the 43 banking institutions, 40 were privately owned while the Government of Kenya had majority ownership in 3 institutions. Similarly, of the 40 privately owned banks, 25 were locally owned (the controlling shareholders are domiciled in Kenya) while 15 were foreign-owned (many having minority shareholding) (CBK Annual Report, 2017). The 25 locally owned institutions comprised 24 commercial banks and 1 mortgage finance company. Of the 14 foreign-owned institutions, 11 were local subsidiaries of foreign banks while 3 were branches of foreign banks. All the licensed forex bureaus, microfinance banks, credit reference bureaus, money remittance providers, non-operating bank holding companies and representative offices and were privately owned (CBK Annual Report, 2017). The financial performance of the banking sector has shown steady improvement in the past decade. This performance is largely supported by a favorable political, social and economic environment.

The banking sector's total assets expanded by 429.94 per cent from Kshs755.3 billion in 2006 Ksh. 4,002.7 billion in December 2017. This is a phenomenal growth in a span of twelve years. A review of the banking sector investment strategy indicates that, the growth in the bank assets can be attributed to the sector's investment in government securities, considered to be less risky. During the period, the sector investment in Government securities increased by 590.46 percent, from KSh.144.6 billion in 2006 to KSh. 998.41 Billion in December 2017.

The increase in investment in Government securities might be attributed to interest rate capping introduced by the government, occasioned by the high interest rate spread and the inability of the banking sector to regulate interest rates on loans (CBK Annual Report, 2017). Banks generate revenues from issuing of loans and advances. During the period, loans and advances grew from KSh. 396 billion in 2006 to Ksh. 2,013.6 billion in December 2017, representing a 408.48 percent increase. To support issuance of loans and advances, banks need to mobilise substantial amounts of

customer deposits. In the period under study, customer deposits grew from KSh. 579.5 billion in 2006 to KSh. 2,900.0 billion in December 2017. This represented a 385 percent increase during the period. The performance could have been supported by mobilization of deposits through introduction of agency banking and mobile phone banking.

1.2 Statement of the problem

Despite the overall impressive performance of the banking sector, there are inherent differences in the performance of individual banks. To this extent, the differences in the performance of the banks could be attributed to their different operational efficiency levels. In a competitive business environment, such as the banking sector in Kenya, rivalry forces commercial banks to reduce their operational costs leading to increased cost efficiency. This improved cost efficiency translates to efficient financial resource allocation to stimulate economic growth and development (Kofi, 2013).

The banking sector in Kenya has experienced high interest rate spread over the years, whereby the lending rates are more than double the savings rate. According to Sologoub, (2006), this is an indication of intermediation inefficiency. The period 2006 to 2017, witnessed introduction and adoption of new technologies by the banking sector to support efficiency improvement. These technologies have transformed financial services and information efficiency in the sector.

This period therefore provides an important stage to analyze the effect of efficiency on performance to enable the setting up of appropriate policies to regulate and reform the banking sector in Kenya. As such, when a financial institution collapses, the economic consequences are usually very severe. The collapse or poor performance of a financial institution could arise due to myriad of reasons; financial information inefficiency which affects availability of critical information for decision making such as interest rates, credit reference bureau reports and the quality of such information; the resources allocation efficiency which drives away potential customers due to bureaucratic procedures that cause inconveniences to customers due the direction and amount of resource allocation; financial services efficiency

which determine the level of innovation in financial services and products, payment system reliability; financial management efficiency which relates to capital adequacy compliance, liquidity management & provision for loan losses, corporate governance structure efficiency which could potentially influence the policy direction of the institution in a certain manner in terms of investment decisions and thus expose the business to risk.

Although Kenyan banks have demonstrated resilience and have consistently reported good performance, some have been put under statutory management, raising questions on their performance and financial efficiency. The sector has experienced several reform oriented policies in the past two decades, including raising of the minimum capital, targeted at efficiency and performance improvement. Further, the sector has seen growth in financial innovations such as ATMs, internet banking and mobile phone banking. These innovations involve financial technologies (FinTech), that leverage on the use of Information and Communication Technology (ICT), to develop new financial products and bolster the intermediation efficiency function. These innovations facilitate financial efficiency improvement in the banking sector operations. Beim and Calomiris (2001), posit that inefficiency of financial intermediation in the banking sector is one of the key determining factors of financial crisis in emerging markets. Beck and Fuchs (2004) opine that financial intermediation inefficiency may be observed through the high interest rate spreads charged by commercial banks as a result of high overhead costs. This is a peculiar characteristic in the banking sector in Kenya, which prompted the CBK to start regulating interest rates. Similarly, Siraj and Pillai, (2011), indicate that the global financial crisis of 2008 affected key determinants of financial intermediation efficiency, suggesting that a proper understanding of its drivers provides a fertile ground for proper management of commercial banks. Recent studies on the Kenyan banking sector have addressed issues of corporate governance and the evolution of electronic banking (Beck et al., 2010). The studies in literature highlighted provide mixed results on the measurement of bank performance. Most studies cited used ratio analysis (Ongore, 2013, Githinji, 2010, Bisher, 2011) leaving out efficiency thus creating a gap. Further, they also focused on developed and industrialized economies (Altunbas, et al., 2007, Fiordelisi et al., 2011). For instance, Shah & Jan, (2014)

indicate that the expense ratio has traditionally been used to measure operational efficiency, an individual measurement element. The ratio shows the extent to which management may reduce costs and increase income. High ratios depict the inefficiencies managing expenditure leading to poor performance from the resultant losses. It is therefore an important factor due to its connectedness to competition and profitability favorably (Allen and Gale (2004) and unfavorably (Pruteanu-Podpiera et al., 2016).

Therefore, as the banking sector in Kenya is characterized by high interest rates spreads with simultaneously high profitability, raises pertinent policy issues pertaining to financial intermediation efficiency.

This study therefore sought to determine the extent to which financial intermediation efficiency, in aggregate form of inputs to output impacts on bank performance and provide policy recommendations. It is expected that efficiency improves profitability and customer satisfaction through service and information efficiency. Does financial intermediation efficiency accompany improved profitability and customer satisfaction?

1.3 Research Objectives

1.3.1 General Objective

The general objective of the study was to determine the effect of financial intermediation efficiency on performance of commercial banks listed on the Nairobi Securities Exchange in Kenya.

1.3.2 Specific Objectives

i. To evaluate the effect of financial management efficiency on performance of commercial banks in Kenya

ii. To analyze the effect of corporate governance structural efficiency on performance of commercial banks in Kenya.

iii. To assess the effect of financial services efficiency on the performance of commercial banks in Kenya

iv. To examine the effect of financial information efficiency on financial performance of commercial banks in Kenya

v. To assess the determinants of financial intermediation efficiency of commercial Banks listed on the Nairobi Securities Exchange in Kenya

1.4 Research Hypotheses

H_{01}: Financial management efficiency has no significant effect on the performance of commercial banks in Kenya

H_{02}: Corporate Governance Structural efficiency (CGSE) has no significant effect on the performance of commercial Banks in Kenya,

H_{03} Financial Services efficiency (FSE) has no significant effect on performance of commercial banks in Kenya

H_{04}: Financial information efficiency (FIE) has no significant effect on the performance of commercial banks in Kenya

H_{05}: Financial intermediation efficiency is not influenced by any factors such that there is no significant effect on the performance of commercial banks in Kenya.

1.5 Significance of the study

This study was motivated by the need to provide additional insight concerning the debate on the effect of financial intermediation efficiency on performance of commercial banks. Where as many such studies have been done in the developed countries, a study on the Kenyan context would be deemed worthwhile. Being a developing country, Kenya requires a stable and efficient financial system to support its economic activities.

Understanding the drivers of bank efficiency, and how efficiency impacts on performance, ensures that the strategic business decisions are focused at maximizing and improving the quality of service provision, access to financial services and realization of the overall economic development through resource allocation, risk

transfer and management. Further, it will guide policy formulation, and grow and guarantee confidence in the sector by investors. Banking sector players will also be able to identify inefficient units, eliminate them and improve performance and general stability of the financial system of the country. The efficiency research would help in screening and identifying targets for potential mergers and acquisitions.

Additionally, the study draws the attention of policy makers, regulators, managers, researchers and owners of financial institutions. The policy makers, led by the government, gain from a deeper understanding of efficiency of banks since the performance of the banking sector can impact on certain policies implemented in the financial system. Policy decisions such as deregulation, introduction or removal of interest rate restrictions and entry barriers or imposition of the same, are better understood through a clear understanding of the efficiency of the banking. These policies ordinarily, aim at stimulating the growth of the financial sector, reduce leakages and waste and promote competition in the sector. For regulators, the study provides a better framework for informed regulatory decisions relating to issues such as market power and market concentration in the banking sector.

They are able to gain an understanding as to whether bank profitability is driven by efficiency of their operations or market power. The market power hypothesis argues that concentrated banking sectors may earn high profits through setting prices of financial products and services that are exploitative to their customers. On the contrary, the efficient structure hypothesis argues that efficient banks should be able to generate higher market shares and earn high profits, induced by competitive prices and efficient performance rather than market power. For bank managers and executives, this study is significant from the business strategy point of view.

The managers need to establish the reasons and the determinants of how they can improve their performance from both the input and output perspectives. The input decisions largely dwell on improving cost efficiency by applying modern technology, managerial practices and enhancing capital investments. On the other hand, output decisions focus improving profit efficiency through adoption of appropriate marketing and pricing strategies for products.

From a research perspective, efficiency studies enable researchers to gain an understanding of a wide range of efficiency indicators compared with other measures and show how their results may be affected by different models. Further, they also increase the accuracy of banks' rankings through comparative analysis according to their efficiency measures in order to help identify best and worst practice institutions to help set policies that encourage improvement. Finally, the shareholders will reduce agency costs associated with monitoring of the actions of the managers providing that the managers undertake their operations efficiently. The efficient operations by managers are in line with the interest of the shareholders.

1.6 The Scope of the study

This study focused on commercial banks listed on the Nairobi Securities exchange between 31st December, 2006 and 31st December, 2017. Firms listed on the Securities Exchange constitute a significant proportion of the financial sector and their impact on financial and economic development is visible. Banks, provide direct impact on the performance of the Kenyan economy and have a perceived higher level of financial and intermediation efficiency. The listed commercial banks are regulated not only by the central bank of Kenya, but also by other authorities such as the capital markets authority (CMA) and the Nairobi Securities Exchange(NSE) and therefore, they are expected to have a high level of intermediation efficiency.

This is depicted on various parameters cited in literature, in particular the CAMEL ratios. In this study financial management efficiency, corporate governance structural efficiency, financial services efficiency and financial information efficiency are used. The study further analyses the Technical Efficiency (TE) and the Scale Efficiency (SE) to evaluate their impact on performance of the commercial banks.

1.7 Limitations of the study

There were a number of limitations faced during the study. These limitations may have affected the results in certain ways. First, the focus of the study was on commercial banks listed on the Nairobi Securities Exchange. Of the forty-three (43)

licensed commercial banks in Kenya, those listed on the NSE as at the time of the study were eleven (11) including one mortgage finance institution.

As such, the focus on the listed banks, restricted the panel observations to eleven years from 2006 to 2017. To overcome the problem, all the listed banks were sampled in the study and the sampling units from each of the listed entity increased to bring the number of yearly observations to analytically acceptable levels. However, this also provided an opportunity for future research to consider all commercial banks licensed and regulated by the central bank of Kenya (CBK).

Secondly, the respondents raised concerns on the length of the questionnaire which they observed to be too long, thus causing a slowdown in obtaining feedback. This problem was mitigated by continued follow-up to make clarifications in areas where difficulties were noted by the respondents so as to receive a higher response rate.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the theoretical postulations and the conceptual framework constructed for this study. The chapter also provides the empirical review on financial intermediation efficiency in the banking sector and its influence on performance. The literature, presents a fecund ground, for the support and attainment of the objectives of the study and to enable contribution to the existing debate on the financial intermediation efficiency studies carried out in other jurisdictions.

2.2 Theoretical Framework

Theories are abstractions, of well thought out statements, backed by evidence, that try to explain certain phenomena or occurrences. They provide a generalized and systematic explanation on a particular aspect of interest. With regard to financial intermediation efficiency and performance, the doctrines that underlie the role of financial intermediaries are a critical basis of the theoretical dispositions. Globalization and the technological advancement has given rise to the need for financial intermediation efficiency. The current business environment, plagued by financial management shortfalls, corporate governance predicaments, questionable quality of products and services, information asymmetry problems, high transaction costs, changing customer tastes and preferences and regulatory challenges, is in dire need of improved efficiency of operations.

2.2.1 The Asymmetry of Information theory

The concept, was first introduced and advanced by Akerlof (1970), in ‘The Market for "Lemons": Quality Uncertainty and the Market Mechanism’. He argued that in many markets, the buyer uses some market statistic to measure the value of a class of goods, whereby the buyer sees the average of the whole market, while the seller has more intimate knowledge of the specific item. This, he referred to as information asymmetry. This phenomenon gives the seller an incentive to sell goods of less than

the average market quality, which then reduces overtime, as will the market size. This leads to moral hazard, adverse selection and increased in monitoring costs. The presence of information asymmetry is an indicator of market inefficiency.

Kwambai and Wandera (2013), indicate that the theory analyses the complexity in distinguishing between customers in the market as it is dominated by those with different characteristics. In an attempt the shore up performance, commercial banks strive to increase the efficiency of their operations by ensuring informational efficiency. Due to inadequacy of information flow, a customer who is likely to default on a loan is selected leading to adverse selection problems. Similarly, where the customer engages in activities that jeopardize the possibility of recovery of the loan, moral hazard is encountered. Thus, according to Kwambai and Wandera (2013), large balances of non-performing loans in commercial banks can be traced to moral hazard and adverse selection problems. The theory therefore provides that, information asymmetries generate market imperfections leading to inefficiency.

For financial intermediation efficiency to be realized, commercial banks must overcome all forms of transaction costs, be they moral hazard or adverse selection related. This theory therefore fits well into the fourth objective of this study as it establishes the nexus between information asymmetry and financial intermediation efficiency function of commercial banks. Depositors will be comfortable with commercial banks whose lending policies are stringent, since their deposits will not be exposed to default risk from borrowers due to failure to fulfill their obligations, thus improving the financial intermediation efficiency. This theory therefore, suits this study as it interrogates the banking intermediation efficiency practices in the banking sector.

2.2.2 The Contemporary Theory of Financial Intermediation

This theory is built around the role played by the financial sector players as intermediaries. The business model of banks is that of risk management in the process of channeling funds from one sector of the economy to the other. From the traditional financial intermediation theory, the existence of commercial banks is justified due to the informational asymmetries, regulation and transaction costs

associated with banking operations. Thus, the traditional theory of financial intermediation attempts to explain the existence of commercial banks as financial intermediaries.

In a new departure, Claus & Grimes (2003), indicate that the modern theory of financial intermediation lays more emphasis on the role of commercial banks rather than why they exist. They argue that banks facilitate information collection, monitoring of borrower's performance and risk management & sharing. From this functional point of view, the theory articulates fundamental financial intermediation efficiency aspects relevant for this study. According to this theory, information asymmetry leads to increased monitoring and verification costs and the need for stricter regulation. These aspects affect the financial management capabilities as they involve significant expenditure.

Mwangi (2014), indicates that regulation curtails the autonomy of financial institutions. Regulation influences the liquidity of the banks, thus impede the level of intermediation efficiency. According to Diamond and Rajan (2000), regulation influences the profitability performance of commercial banks. They argued that regulation makes commercial banks that are capital constrained to be at risk of failure. With respect to transaction costs, the theory provides that the participants in the banking sector adopt and apply different transaction technologies, taking advantage of scale economies to improve financial management.

2.2.3 The Efficiency Structure Hypothesis

This premise was proposed by Demsetz (1973), who argued that, the higher profits reported by commercial banks are not due to their collusive or oligopolistic behavior, but because of high operational efficiency level. According to the efficiency structure hypothesis (ESH), financial intermediation efficiency yields a larger market share and profitability. There are two main hypotheses under the Efficient-Structure theory, the X-efficiency and Scale-efficiency.

The X-efficiency postulate denotes the banks' ability to generate more profit through lowering of costs occasioned by management efficiency. This dimension provides

that, management efficiency as a result of prudent and frugal decision making, is the key driver of profitability. It emphasizes that banks perform better by ensuring seamless operations. On the other hand, the Scale-efficiency hypothesis posits that, some banks are more efficient than others due to their capacity to achieve economies of scale, which permits them to have lower costs and make higher profits (Thoraneenitiyan 2010). Therefore, the efficiency structure hypothesis postulates that the relationship between market structure and performance of any firm is defined by its efficiency. Thus, banks with superior management and technologies, depict higher intermediation efficiency as shown by lower costs and higher profits.

Mensi and Zouari (2010), provide that, a bank which operates more efficiently than its competitors, gains higher profits resulting from low operational costs. Yet, the same banks hold an important share of the market, and consequently, a difference at the level of efficiency, creates an unequal distribution of positions within the market and an intense concentration and competition. According to Seelanatha (2010), while investigating the impact of bank's level of efficiency measured by Structure-Conduct Performance & Relative Market Power and market structure measured by X-efficiency & Scale-efficiency on banks' performance, proxied by profitability ratios, revealed that a banks' performance depends highly on their level of efficiency and not on its market structure. This finding emphasizes the importance of efficiency in the banking sector and its potential to enhance the level of financial development and economic stability.

Financial intermediation efficiency, as a key factor of competitiveness, has received a multidimensional interest, justified by the coexistence of well-defined capacities and skills making up an inter-related set of various capabilities. Among these capabilities, the bank should be skilled, innovative and knowledgeable, have the talent to reinforce the training process and its relational network. Further, the bank should as well master the sense of prediction and selection and rely on human intellectual capital. Therefore, cost shrinking is no more the objective in itself, since banking institutions are seeking the adjustment of costs to quality and to products volumes in order to be efficient (Mensi and Zouari 2010).

Accordingly, Grygorenko (2009), opines that the profitability of a bank is determined, not by market concentration but by the banks' intermediation efficiency. Therefore, this hypothesis contends that a bank that operates more efficiently gains higher profits resulting from low operational costs and acquires a larger market share. This phenomenon leads to differences in the level of efficiency that ultimately creates an unequal asset allocation, distribution of positions within the market and intense market concentration (Mensi et al., 2010).

In summary, the ESH has been proposed and presented in two different forms, in financial intermediation efficiency analysis. The X-efficiency or technical efficiency form imply that, more efficient firms have lower costs, higher profits and larger market share, because they have a superior ability in minimizing costs to produce any given outputs. Similarly, the Scale Efficiency form suggests that, the same relationship described above is due to the fact that more scale efficient firms produce closer to the minimum average-cost point.

The efficiency hypothesis therefore fits well with this study in analyzing the effect of financial intermediation efficiency on performance of commercial banks.

2.2.4 Agency Theory

The agency theory was first introduced in the 1930s by Berle and Means. The theory provides that, a limited company's equity structure leads to the transfer of corporate control from an individual to professional managers. Thus, when control is distinct from ownership, those in control may deploy assets in ways that benefit themselves rather than the owners. This leads to the principle - agent problems due to separation of ownership and control. The interests of a companies' stockholders and that of their agents are not always convergent. This is because, agency is the relationship between the principal and agent (Jensen and Meckling 1976), whose interests are not homogenous. This theory arises from the fact that ownership and management of a firm are different and independent entities.

Various stakeholders; managers, creditors, financiers, shareholders among others, interact in the business environment giving rise to agency relationships. The

shareholders, not being able to manage the business by themselves due to various reasons, such as geographical dispersion, large number of shareholders or even lack of technical knowledge to run the business, entrust this responsibility to managers creating an agency relationship (Lee, 2008). The nature of this relationships give rise to conflict of interest among the parties involved, leading to severe problems for the firm, as each party tries to satisfy their own private needs.

According to Brennan and Solomon (2008), corporate governance structure mechanisms are aimed at abetting or solving the agency problem. Therefore, the efficiency of the corporate governance structure mechanisms is vital in providing solutions to these conflicts because it affects the overall financial performance of the bank.

The conflict of interests arising from the agency problem becomes a major source of inefficiency in the management of the affairs of the bank. This theory is therefore relevant to this study as it provides the basis for the existence of an efficient corporate governance structure mechanism to facilitate the intermediation role of commercial banks.

2.2.5 Public Choice Theory

The public choice theory was developed by Buchanan and Tullock (1962). According to this theory, government is composed of politicians and bureaucrats who may be motivated to use state or public office to secure political office, accumulate power, or even seek rent. State actors will therefore most likely act in their selfish interest where there are weak institutional structures. Kenya is therefore not immune and this theory best describes the public office arrangement in Kenya. The government owns several financial institutions or has a larger shareholding. Because of this ownership, the government can therefore influence the operations of these institutions thereby inhibiting their efficiency and ultimately performance. Accordingly, Clarke et al. (2003), argues that inefficiencies abound in government for various reasons such as political interests, lack of competition due to absence of the profit motive and lack of clear objectives. As some of the listed banks on the

NSE are majority owned by the Government, this theory applies in explaining the level of intermediation efficiency and performance differences of the banks.

2.2.6 The stakeholder theory

This theory was originated by R. Edward Freeman in 1984. The theory is that of organizational management and business ethics that addresses morals and values in managing an organization. Hillman et al. (2001), contend that the theory offers a means of examining the links between performance, board diversity and representativeness by incorporating the qualitative dimensions of these relationships.

According to this theory, a stakeholder approach identifies and models the groups which are stakeholders of a firm and describes and recommends methods by which management can give due regard to the interests of those groups. This theory identifies other groups that interact with the business on a day to day basis, who then constitute the stakeholders. These groups include, except shareholders; customers, suppliers, governmental bodies, financial institutions etcetera.

Gerde (2000), points out that a stakeholder viewpoint on corporate governance is principally relevant to the context of public and private partnerships and other collaborative service delivery arrangements because it offers a "systems-centered" perspective on how constituent interests are represented. Hillman et al. (2001), find that board members who represent stakeholder groups, serve not only the interests of the organization but also the interests of other constituent groups. Scholl (2001), argues that stakeholder theory is vital in explaining managerial decisions and that stakeholder characteristics can influence policy outcomes and the extent of inter-organizational relationships.

Stakeholder representation and responsiveness can also be a challenge, such that the increased demands on protection of stakeholder interests may strain organizational capacity and threaten accountability (Bryer 2007). Thus, with regard to intermediation efficiency of operations of a bank, these stakeholders may be affected in a multiple number of ways. Highly inefficient banks cause the stakeholders to become frustrated and disgruntled, since they are not getting valuable services; hence

substitute the consumption of goods and services of the bank. This may impact negatively on the overall performance of the bank. This theory is fit for this study because, a positive relationship between intermediation efficiency and financial performance ensures that the interests of the stakeholders are guaranteed.

2.3 Conceptual Framework

Conceptual framework is a nonfigurative or general impression derived from specific phenomena or instances (Kombo and Tromp 2009). It is a research tool envisioned to assist a researcher to develop awareness and understanding of the situation under scrutiny. The business environment is in a constant state of change, owing to new innovations, globalization and technological advancements which breeds uncertainty with respect to future performance of the business. The change is in terms of financial management, Governance Structural efficiency, Financial Services and Information efficiency brought about by firm specific, industry specific and macroeconomic characteristics.

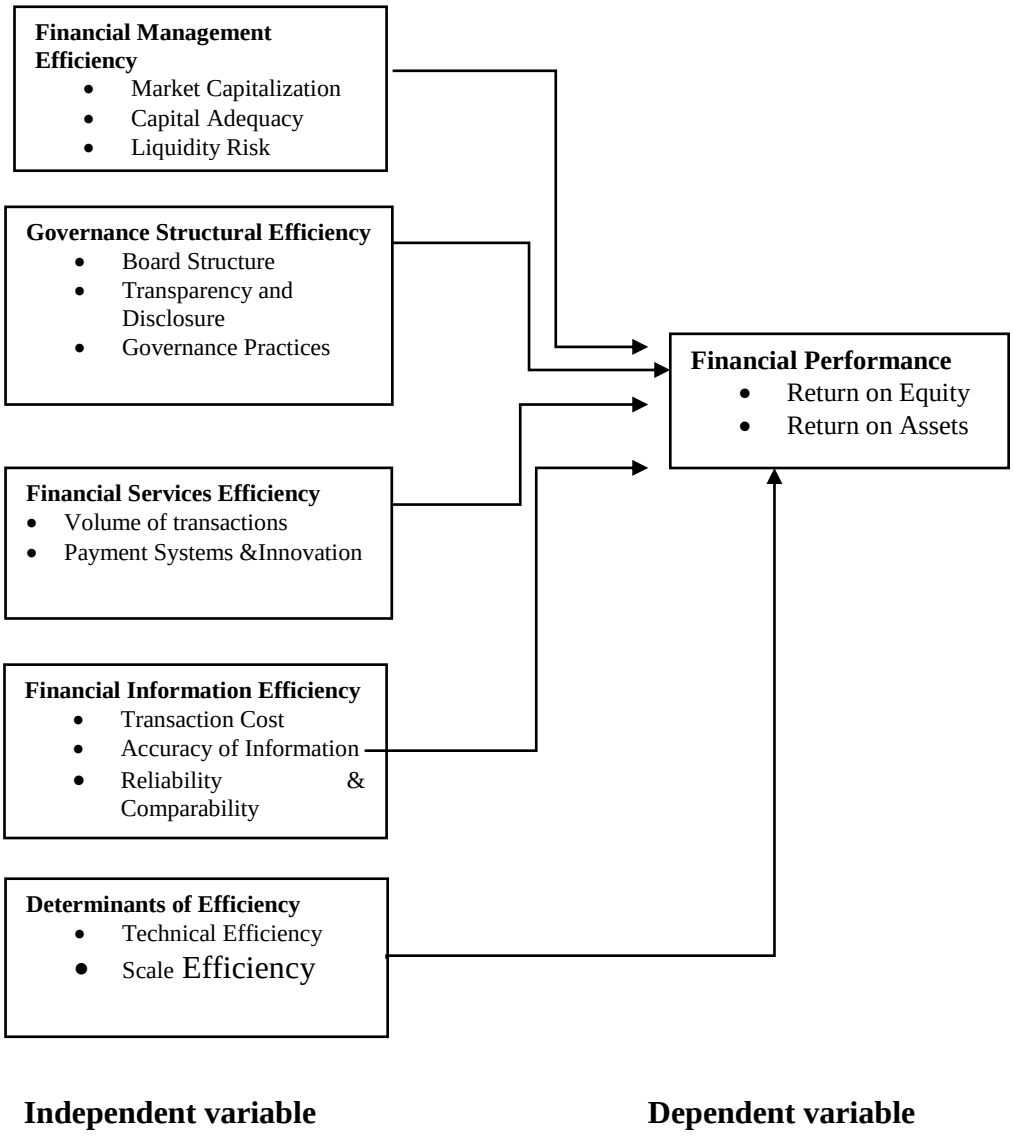

Figure 2.1: Conceptual framework

2.4 Review of Variables

This section presents an empirical review of the variables used in the study. The focus is to establish and support the rationale of the study based on similar researches undertaken in other parts of the world.

2.4.1 Financial Efficiency on Performance of Commercial Banks

Financial efficiency is the banks' ability to transform its financial and other resources into strategic mission related activities. It facilitates the analysis of the intensity and

effectiveness of a banks' production, pricing, financing and marketing decisions for its products and services. The efficiency of financial management of a bank vests in the capacity to transform assets into productive use at least possible input. To analyze financial efficiency, key attributes and factors that depict the financial propriety of a bank re considered. This include but not limited to bank size, capital adequacy, leverage, capitalization, liquidity risk, portfolio risk. These are explained in the following sub-sections.

2.4.1.1 Bank Size

The size of the bank as measured by the bank's total assets, is an important attribute of a bank. Tan and Floros (2013), found that bank size has a positive and significant effect on bank efficiency in China. Homma et al. (2014), in a study on the effect of bank size on efficiency in Japan indicate that, consistent with the efficient structure hypothesis, Japanese banks grew larger. They also report that; market concentration weakens bank efficiency. Almoneef and Samontaray (2019), found that board size, audit committee meeting and bank size has a positive impact in Return on equity. They also indicate that board independence has negative relationship with ROE. The results also found that board size and bank size have a positive relation with ROA and board meeting's relation with ROA is opposite.

Contrarily, Yin et al. (2013), showed that bank size is negatively related to efficiency and that, as bank size grows larger, efficiency is diminished. Rosman et al. (2014), explains that larger banks devote less investment on their inputs because of their perceived market power. Lee and Kim (2013), studied the effect of bank size on profitability in Japan. The findings indicate that bank size has a negative relationship with profitability.

Juxtaposed with the Kenyan context, the banking sector in Kenya has seen banks with larger asset bases being more profitable. However, Bourkhis and Nabi (2013), concluded that smaller banks are less risky and more stabilized.

2.4.1.2 Capital Adequacy

Capital adequacy indicates the size of capital compared with the bank's total assets. Kosmidou (2008), defines capital adequacy ratio, as the sufficiency with which the amount of equity is able to absorb any shocks that the bank may experience. Due to the complex nature of the capital structure of a bank, strict and tight regulation is imperative. According to Kamau (2011), capital plays a crucial role in reducing bank failure and losses to depositors occasioned by a catastrophic event. Beckmann (2007), observes that highly capitalized banks may realize low profitability since the high capital ratio renders them to be risk-averse, as they tend to ignore potentially risky investment opportunities because investors demand a lower return on their capital in exchange for lower risk.

On the contrary, Gavila et al. (2009), argues that, although capital is expensive in terms of expected return, highly capitalized banks face lower cost of bankruptcy and lower need for external financing, and in particular, emerging markets where external borrowing is difficult, thus highly capitalized banks should be profitable than lowly capitalized banks.

According to Neceur (2003), there is a strong positive relationship between capitalization and return on assets (ROA). Similarly, Sufian and Chong (2008), found the same results after examining the effect of capitalization on the performance of commercial banks in Philippines.

Olweny and Shipho (2011) indicate that factors such as capital adequacy, asset quality and liquidity management had a positive and significant effect on the performance of commercial banks in Kenya. Apergis (2014) avers that bank regulators attempt to ensure that banks maintain more than the minimum capital requirements so as to reduce the probability of insolvency. Similarly, Gardener (2012), on investigating the capital adequacy ratio of commercial banks with respect to technical and cost efficiencies, showed that banks with higher capital were more efficient than those with lower capital. Williams (2014) contends that banks with higher capital adequacy ratios are more stable and are not exposed to the risk of insolvency.

2.4.1.3 Financial Leverage

Financial leverage is the ability of the bank to use fixed financial charges, to magnify the effects of changes in earnings before interest and tax (EBIT) on the earnings per share (EPS). According to Alkheil et al. (2012), financial leverage is the ratio of total assets to total shareholder equity. A firms' financial leverage involves the use of funds obtained at a fixed cost in the hope of increasing shareholders' wealth. Specifically, it is the use of long-term fixed interest bearing debt and preference share capital along with equity capital. Abu Alkheil et al. (2012) contend that the financial leverage ratio is used to determine the amount of assets financed by shareholder's equity and that the ratio has a negative correlation with bank efficiency. Financial leverage may be favorable or unfavorable.

Favorable financial leverage occurs when the company earns more on the assets purchased with the funds, than the fixed cost of their use, a phenomenon kwon as positive financial leverage. On the other hand, unfavorable financial leverage occurs when the company does not earn as much as the funds cost.

2.4.1.4 Liquidity Risk

Liquidity risk, also known as credit risk, is determined as the ratio of total loans to total deposits of the bank. As a banks' main business is accepting deposits and advancing loans, this ratio indicates the extent of risk of lending from bank deposits. Repkova (2015), investigated the Determinants of banking efficiency in the Czech Republic. The results showed that liquidity risk has a positive effect on banking efficiency. According to Hou et al. (2014), reducing the credit risk in banks, leads to maximization of efficiency, thus ensuring that clients can always be able to access their deposits on demand. From this argument, it follows that, if a bank is exposed to higher liquidity or credit risk, it means that banks use borrowed funds rather than deposits for lending, leading to cost inefficiency, resulting from increased finance costs. Chitan (2012), found that liquidity risk had a significant negative impact on profitability, implying that bank efficiency is affected.

Since banks accept demand deposits, liquidity becomes one single most important decision variable for many bank managers. According to Kamau (2009), the opportunity cost of holding high liquidity is the potential high return investments that the bank would otherwise have undertaken. Generally, a trade-off exists between profitability and liquidity risk management. Usually, an observed shift from short term securities to long term securities, or increase in loans and advances, raises a bank's profitability but increases its liquidity risks at the same time.

Consequently, high liquidity ratios are indicators of less risk and low profitability, putting the management of commercial banks at crossroads between liquidity risk management and profitability. Although more liquidity increases the ability of the bank to raise cash on short-notice, it also reduces management's ability to commit credibly to an investment strategy that protects investors' which, finally, can result in reduction in the firm's capacity to raise external finance (Uzhegova, 2010).

Therefore, the extent to which credit risk affects the general financial health of the bank, depends on the quality of assets held by the bank. Bank asset quality depends largely, on the trends of non-performing loans and the nature of bank borrowers. Waweru and Kalani (2009), record that, many of the financial institutions that collapse, owe it to non-performing loans and extensive insider lending. According to Kosmidou (2008), there is a significant negative correlation between asset quality and bank profitability, confirming that increased exposure to credit risk is associated with a decline in firm profitability, requiring that banks can improve profitability through increased screening and monitoring of credit risk.

2.4.1.5 Market Capitalization

Vu and Nahm (2013), in a study of the relationship between market capitalization and bank efficiency, observed that there is a positive relationship between market capitalization and bank efficiency. According to Nguyen et al. (2012), market capitalizations increases the strength of commercial banks and guarantees their steady performance over time. Koster and Zimmermann (2017), investigated bank capitalization and bank performance: a comparative analysis using Accounting and Market-Based Measures. The results showed that higher capitalization reduces bank

risk and is associated with increased profitability. From this findings, the significance of market capitalization can be established.

2.4.2 Corporate governance structural efficiency on performance

Corporate governance refers to a set of mechanisms; institutional and market based, designed to alleviate agency problems that arise from the separation of ownership and control in a firm (La Porta et al, 2002). It is the exercise of power over corporate entities Therefore, agency problems brought about by separation between ownership and management necessitates an efficient corporate governance structure. Child and Rodrigues (2004), opine that corporate governance structure operates through two agency relationships: between stockholders and management; and between employees and management.

This study focused on the former agency relationship, on the premise that governance structures of banks are well described by their capital and ownership structures and that governance structure efficiency can determine a bank's investment, growth, profitability and stock returns. Corporate governance in banks involves the range of practices, covering proper conduct of business, values, ethics, organizational culture and staff behaviour. Accordingly, corporate governance not only involves process and financial targets to serve the interest of the shareholders, but also the best practices of conduct with depositors, customers and other stakeholders. Denis and McConnell (2003), argued that, corporate governance mechanisms can be classified into internal monitoring mechanisms such as ownership structure, board characteristics, outside supervision and executive compensation, and external monitoring mechanisms such as legal system, active takeover market and production market competition. In the following sections, we describe the mechanisms of corporate governance.

2.4.2.1 Board Structure, Size and composition

Board structure refers to the schematic categorization or composition and size of the board of directors of a bank. The structure focuses on the background, interests, affiliations, technical skills and competencies that brings about balance in decision

making in the interest of the shareholders. Agyemang and Castellini, (2015), contend that there is no consensus in literature on an optimal board structure. The Australian Stock Exchange Corporate Governance Council (2003), provides that a company should structure its board to add value. This observation therefore implies that the board should be well constructed as to be able to add value to the bank, a rich source of reference for good corporate governance practice. Yasser et al. (2017), showed that there is a positive relationship between board structure and firm performance.

Specifically, they indicate that board size, minority representation in the board, and family directors in the board, had a positive and significant relationship with firm performance. The findings further provide that, independent directors in the board were negatively associated with firm performance. Poudel and Hovey (2013), on investigating the impact of corporate governance on efficiency of Nepalese commercial banks, recognized that bigger boards and audit committees & lower frequency of board meetings and lower proportion of institutional ownership led to better efficiency in the commercial banks. From this finding, larger boards provide a large pool of expertise and a better ability to form reasonable judgment and decisions on matters affecting a corporate entity. However, it is noteworthy that the composition of the board rather than board size per se is significant in determining bank performance. The existence of independent directors on the board is imperative. Contrarily, Spong and Sullivan (2007), observe that board of directors are likely to have a more positive effect on bank performance when directors had a significant financial interest in the bank.

Botti et al. (2014), indicated that, a large body of corporate governance literature provides that, the board size of a firm, captures the quality of board monitoring of the firm operations. Smaller boards are considered conducive for effective managerial oversight, as they are associated with lower coordination costs, better exchange of ideas, and less free-riding among members. As such, directors serving on small boards have fewer communication difficulties, thus allowing them to better coordinate their efforts in limiting managerial opportunistic behaviour (Botti et al., 2014). According to Bushman et al. (2004), smaller boards are more likely to deliver superior quality information to investors and also guarantee their interests due to

their keen concern on their responsibilities for effective monitoring and high quality disclosure. Tanna et al. (2011), found that board size has a significant effect on bank efficiency and performance. Sakawa and Watanabel (2011), find that banking firms with larger boards underperform their peers, however, Poudel and Hovey (2013), argued that bigger board size and audit committees and lower frequency of board meetings led to better efficiency for commercial banks. Sakawa and Watanabel (2011), used the Tobin's Q, as the proxie for performance, in which they further indicated no significant relationship with the proportion of external directors on the board. Yamori et al. (2017), studied corporate governance structure and efficiencies of cooperative banks in Japan. The results showed that having a large number of board members has negative effects on efficiency. Their findings also indicate that the presence of outside directors has a significant effect on efficiency.

From the arguments presented in the literature, board structure, size and its composition are critical in ensuring efficiency of the corporate governance mechanisms of the bank.

2.4.2.2 Board Meetings and Schedule

According to Fama & Jensen (1983b), of the agency theory conjecture, the frequency of board meetings as a monitoring tool, facilitates the attainment of better governance and improved firm performance. The stewardship philosophy on the other hand, provides that board meetings are irrelevant, citing that, monitoring of firm operations is an endogenous process influenced by factors outside of the firm. From this supposition, the relationship between the frequency of board meetings and firm performance maybe insignificant. However, Ntim and Osei (2011), found a positive and significant relationship between the frequency of board meetings and firm performance. They argued that meetings provide a mechanism for monitoring, which positively impacts on firm value. Brick and Chidambaran (2010), find that, the frequency of board meetings positively affects corporate performance. Eluyela et al. (2018), found a positive and significant relationship between board meeting frequency and firm performance.

From this arguments, the problem of information asymmetry maybe easily eliminated, due to the pressure created by the relatively high number of meetings. Chou et al. (2010), argued that a high attendance rate at board meetings is an important monitoring mechanism of the operations of the firm. The high attendance ensures that the managers obtain first-hand information on the operations of the firm and its management. Mamatzakis and Bermpei (2015), evaluated the impact of various corporate governance measures on the performance of the US investment banks over the 2000 –2012 period. The results indicated a negative link between operational complexity and bank performance. The results further showed a positive relationship between CEO power, board share ownership and bank performance.

2.4.2.3 Transparency and Disclosure

The focus, on transparency and disclosure, as part of the core values of organizations, shirks the possibility of malpractice that affect the integrity and level of efficiency of operations of the bank. As such, Bushman et al. (2004), defined transparency as the availability of firm specific information to outside stakeholders. The firm specific information is varied. For this study, we focused on staff costs and directors' remuneration, online publishing of corporate information, ownership &shareholding disclosure, appointment & rotation of auditors and audit fees disclosure. This information is critical in enhancing the reputation of the bank and guaranteeing confidence from investors. Behrmann et al. (2018), argued that disclosure of the individual details of remuneration for each board member, is critical as a transparency mechanism. They aver that, the disclosure provides a factual assessment of decisions on remuneration leading to a potential surge in transparency. Performance-related compensation, is a great motivator for management performance. Compensation based on performance facilitates the alignment of the interests' shareholders to the objective of the bank and other stakeholders.

Stiglbauer (2010c), found evidence of the existence of a significant and positive relationship between transparency & disclosure and firm performance. The study used the market-to-book value of equity and total shareholder return. Being highly controlled and regulated institutions, banks must demonstrate their ability to be the

custodians of the funds from the surplus income units in the economy and also provide a mechanism for the deficit economic units through the intermediation process, and opportunity to access the funds for investment. Darmadi (2011), found that the average disclosure level among the sampled Indonesian Islamic banks is relatively low. He argued that that there is need for enhancement of corporate governance disclosure of Islamic banks, to provide confidence for wider acceptance and increased reputation.

According to the International Accounting Standards Board (IASB), "the objective of financial reporting is to provide financial information about the reporting entity that is useful to present and potential equity investors, lenders and other creditors in making decisions in their capacity as capital providers" (IASB 2008). Identifying cost efficient, first and effective mechanisms for provision of such information is imperative. Today, the internet is one of the most powerful tool of communication. It can reach significantly large populations at very minimal cost, and encourages investment (Aly et al., 2010). Adoption of such modes of transmitting information would create cost savings for the user entity. Waweru et al. (2019), investigated Corporate governance and corporate internet reporting in sub-Saharan Africa, with specific reference to Kenya and Tanzania. The results showed that, Corporate Internet Reporting (CIR) was high in both countries, but with Kenya having the highest level of Internet Reporting. The results further indicate that, CIR increases with foreign ownership, audit committee independence and financial expertise, but decreases with domestic ownership concentration. They also find that, despite the effects of ownership concentration being moderated by country-specific factors, the overall findings demonstrate that effective governance structures may lead to higher levels of CIR (Waweru et al., 2019). Aly et al. (2010), indicate that the level of profitability of a firm positively affects internet financial reporting.

According to Ahmed et al. (2002), highly profitable firms tend to disclose more information as a means to acquire bragging rights among their peers. This behaviour enables the said firms to show off their achievements on the internet to portray their positive reputation, thus enabling them to access credit at favourable terms. Therefore, due to the technological advancements and the fact that technology has

facilitated significant reduction in operational costs, leveraging on the opportunity provided by technology is of significant importance in the current competitive business environment.

2.4.2.4 Ownership and shareholding

Another significant corporate governance aspect is ownership and shareholding. Denis and McConnell (2003), indicate that insider ownership can have a positive effect on firm performance. While this argument is true, the extent of disclosure of this information is critical due to the regulatory requirements in different jurisdictions. In Kenya for instance, the insider individual ownership is restricted to a maximum of 5% by the Companies Act. Horner (2010), found a positive and significant relationship between the board of directors' ownership in a firm and performance. He argued further that firms with concentrated ownership have weak governance structures leading to poor performance. Concentrated ownerships of firms may lead to expropriation of the company assets by adopting the conservatism principle, where they not only expropriate but also conceal their behaviour through manipulation of books of accounts for their own self-interest and conceal firm performance by applying selective accounting choices (Korczak and Korczak 2009).

2.4.2.5 Appointment of External Auditors and Audit fees

Appointment of external auditors aims at providing quality assurance on the financial statements of the firm. The auditors, appointed through the annual general meeting, can be retained or a new team appointed on rotation basis. Rotation of auditors can either be mandatory or voluntary. Mandatory rotation occurs when firms are required to change their auditors after a fixed period of time. The duration may however vary depending on regulatory requirements (Lu, 2005). On the other hand, voluntary rotation is the discretionary changing of auditors by the firm (Davidson et al., 2005). The rotation can either be, audit firm rotation or audit partner rotation. Auditor rotation is aimed achieving high quality audit and assurance.

According to Lu (2005), mandatory rotation curtails the opportunity of opinion shopping by the auditors leading to better audit quality and financial management

advice. This advice is important for facilitating improved organizational performance. Davis et al. (2009), provide that rotation enables different perspectives and insights into the financial statements. They argued that working for the same client for many years impairs professional judgement by the auditor due to the familiarity problem. Other proponents of rotation opine that; it helps in increasing the competition in the audit market by encouraging 'Small' Firms to compete against the 'Big Firms' by providing equal opportunity. In the event of an audit failure, both the client and the auditor could suffer significant losses. Therefore, where there is rotation, the cost thereof, could significantly be less than the cost of litigation and loss of reputation of the auditor from an audit failure (Jackson et al., 2008). As the key role of audit is to provide assurance on the financial statements, this assurance can only be guaranteed when certain minimum standards are met. Yet, if the bar on the required assurance standards is set too high, the quality of the audit could be compromised. Dye (2011), contends that, strict and tighter auditing standards could diminish audit quality due to liability aversion desire by the auditor. They argued that, strict audit standards are difficult to comply with and therefore could compromise the audit quality. Similarly, Sunder (2014), found that tighter auditing standards impede the auditors' application of expert decision on the audit process.

Due to the current complex business environment, corporate governance mechanisms are significantly important, for business sustainability and performance.

The mechanisms provide a framework in which banks are able to constantly improve their performance by alleviating the agency problem predisposition of the organization. Board structure and composition determine the strategic direction of the bank and its routine operational dynamics. This study therefore seeks to advance the literature on corporate governance with specific reference to the performance of commercial banks in Kenya. Caton and Goh (2008) found that firms with democratic governance structures realize significant positive abnormal stock returns on their investment. Therefore, corporate governance mechanisms are aimed at protecting the interests of all stakeholders, improving firm performance, and ensuring that investors get sufficient return on their investment. Bauer et al. (2004) examined if efficient corporate governance leads to higher stock returns. The results showed that an

efficient corporate governance structure positively affected stock return, a finding that further confirms the significance of corporate governance structural efficiency. Corporate governance practices thus represent the actual exertions of bank management in designing and enforcing good management practices.

In line with providing solutions to the conflict of interests occasioned by the agency problem, corporate governance enhances the operating performance of firms and facilitates prevention of fraud. It can therefore be argued that banks with better corporate governance have better financial performance than those with poor corporate governance due to improved intermediation efficiency. In a study on Kenyan banks, Mang'unyi (2011) finds that there is a significant difference between corporate governance and firm performance. This finding could be an indicator of why there is wide disparity in the performance of the banking sector in Kenya. Tandelilin et al. (2007) posits that managers and owners depicting the effort and intention to implement good corporate governance mechanisms increase their market credibility, hence better corporate governance leads to better performance.

Therefore, the corporate governance practices adopted by the bank will influence institutional policy implementation such as lending effectiveness, recovery and collections which ultimately affect the performance of the firm.

2.4.3 Information efficiency on Performance of commercial banks

Fama (1970), argued in his famous seminal work dabbed "Efficient Capital Markets: A Review of Theory and Empirical Work", that, a market in which prices always reflect the available information is called an efficient market. He specifically identifies the concepts of fair play and random walk in synthesizing financial markets efficiency, where he made a distinction between the three forms of efficiency: efficiency in its strong form, semi-strong efficiency and weak efficiency. The weak form efficiency hypothesis maintains that the current price of stocks fully reflects all the information concerning the stock market, such as: past prices, exchange rates, volume of transactions and any other information concerning the market. Thus, in an efficient market, past prices cannot be used to beat the market or to obtain profits. Therefore, the chartist or technical analysis of past information is

useless in trying to predict market behaviour. Accordingly, Saramat and Dima (2011), argued that, identifying trends or patterns of price changes in a market cannot be used to predict the future value of assets. The Semi-strong form efficiency hypothesis contends that, share prices reflect all available past and present public information concerning the firms' wealth, its results, dividends, the distribution of free stocks, stock market introduction, etc. In an efficient market, in its semi-hard form, fundamental analysis, founded on public information, is useless.

If the market has achieved this level, then fundamental analysis will not enable investors to earn consistently higher than average returns. Fundamental analysis involves the study of company's accounts to determine its theoretical value and thereby find any undervalued share. Fundamental theory argues that every share in the market has an intrinsic value, which is equal to the present value of cash flows expected from the security.

Event study methods can be used to test this form of market efficiency. Events that may affect share prices include; stock splits, bonus issues, investment in a new profitable project, change in dividend policy among others. Finally, the strong-form efficiency implies, more than that, the quick integration within the market prices, of all available information about the traded asset, including privileged information. That is, share prices reflect all available public information including past, present and the future information. Therefore, if the hypothesis is correct, then, publication of information that was previously classified and private has no impact on share prices, implying that insider trading is impossible. Thus, in order to maximize shareholders' wealth, managers should concentrate on maximizing the net present value of each investment. Strong-form efficient markets levels are where fund managers cannot consistently perform better than individual investors in the market. Thus, fundamental value analysis in determining market prices of shares is questionable. From the efficient market hypothesis (EMH) presented, inference is made to the financial intermediaries' informational framework.

The contractual and informational structures of the banking sector institutions are critical in determining financial intermediation efficiency (Beck, 2007). A significant

amount of transactions of financial intermediaries involve originating and executing financial contracts. The certainty of legal rights of the financial contracts, predictability and speed of their fair and impartial enforcement and a more efficient contractual framework can have a diminishing effect on several components of financial intermediation efficiency.

This helps in creating an information efficient framework that helps reduce overhead costs as the cost of creating, perfecting and enforcing collateral decreases; reduces loan loss provision as better contract enforcement reduces incentives for borrowers to default and increases the share that creditors can recover in case of default (Demirguc-Kunt, et al., (2004), and Laeven & Majnoni 2005).

Yet, information efficiency can also reduce the profit margin by affecting competition, since lower costs of creating and perfecting collateral can lower the costs of switching creditors and reduce hold-up of borrowers by the main creditor (Beck, 2007). Likewise, improvements in the informational framework can reduce information costs whereby more transparent financial statements and credit information sharing lowers the cost of screening & monitoring borrowers and reduces adverse selection problems. Sharing negative information on borrowers through credit reference bureaus also reduces the pertinacious incentive to willful default on obligations. Ostensibly, sharing of negative information on borrowers helps in building up "reputational collateral" in the form of a credit history that will have a positive impact on competition, as borrowers are able to offer their positive credit history to access financial contracts (Beck, 2007).

2.4.4 Financial Services efficiency on Performance

The financial services offered by banks include; payment systems, foreign exchange, cashiering, cheques, debit and credit cards among others. Banking system payments are multifaceted. These include cash payments, cheque payments, card payments, mobile phone payment and internet or electronic payment system. The confidence and integrity of a payment system is vital to ensure customer satisfaction. Payment systems prone to data breaches that degrade the perceived safety and reliability may weaken consumer confidence in those systems and potentially cause them to shift to

other, and perhaps less efficient, forms of payment (Cheney et al., 2012). Therefore, since these payment systems involve a revenue stream to the provider, their increased usage affects the operational efficiency and financial performance of the bank, positively and vice versa.

2.4.5 Performance of Commercial Banks

A bank is an intermediary institution that accepts money from depositors and lends it to borrowers (Majed, 2016). The institution can also be viewed as an organization that produces both deposits and loans using labour and capital (Abdul-Majid et al., 2011). Banks play a critical role and comprise the biggest percentage of the financial system of a country.The financial system plays an important role of intermediation for savers and borrowers in the economy through the banking system. Virtually, all sectors of the economy depend on the banking sector for their survival and growth; business firms, government and households.

Due to this dependence, stiff competition in the banking sector has caused expansion of banking services to insurance, telecommunication and other products (HSBC 2015). Apergis, (2014), provides that, since banks' profits emanate from charging fees and commissions on their services and through interest on loans and advances, then, the most profitable banks are more financially efficient, competitive and stable. The financial efficiency of the commercial banks is therefore essential for economic growth and development because it is the ability by a firm to deliver products and services cost effectively without sacrificing quality using a given amount of capital and resources. Rosman et al. (2014), measured the efficiency of 79 Islamic banks in the Middle East and Asia using DEA approach for the period 2007-2010. The results showed that Asian Islamic banks presented higher efficiency measures than Middle Eastern Islamic banks. According to Majed (2016), the profits and capitalization enhanced efficiency in Middle East but total assets led to poorer efficiency whereas, profits, bank size, capital ratio and loan loss provisions supported efficiency positively for the Asian banks.

Belanes' et al. (2015), concentrated on 30 Islamic banks, analyzing their efficiency using DEA methodology over the period 2005-2011. The results showed that most

banks remained efficient but some banks witnessed a slight decline in intermediation efficiency, measured by technical, pure technical and scale efficiency. Svitalkova (2014), analyzed and compared the efficiency of commercial banks in six European countries namely; Austria, Poland, Czech Republic, Slovakia, Slovenia and Hungary during 2004-2011 using the DEA methodology, using personnel costs, fixed assets and deposits as inputs while the outputs were loans and advances, net interest revenue and loan loss provisions. The results showed that based on the CRS and VRS assumptions, the intermediation efficiency of Austria, Hungary, and Czech Republic were higher relatively compared to Slovenia, Poland and Slovakia. Ohsato and Takahashi (2015), on a study that concentrated on management efficiency of the Japanese banking sector between 2012 – 2013 found that the banks were inefficient scoring using DEA approach, 0.352 and 0.266 for 2012 and 2013, respectively. The study concluded that Japanese banks needed to minimize the inputs and maximize the outputs through strategy review to avoid further decline in intermediation efficiency. In Africa, Assaf et al. (2012), analyzed the cost efficiency of 25 Nigerian banks during the period 2002-2007; the pre-consolidation and the post-consolidation periods following the intermediation approach. The results showed that cost efficiency increased significantly after the consolidation phase, while some banks that could not handle the central bank of Nigeria's new policies on mergers and acquisitions were forced into liquidation.

In South America, and Brazil in particular, Staub et al. (2010), performed a comparison between state-owned, private, foreign, private (domestic) and foreign participation banks in Brazil. The sample used in this study for the period 2002 – 2007, was 184 banks applying the DEA methodology to examine the cost, technical and allocative efficiencies.

The results showed that the cost efficiency was the lowest implying high cost of inputs in Brazilian banks while allocative efficiency was high, and that large banks and foreign banks were the most efficient. The results also revealed that market share and age of the banks led to higher efficiencies. Zhang et al. (2012), in a sample of 133 commercial banks in China, investigated the technical efficiency during the period 1999-2008 in thirty-one regions.

The findings showed that the banks efficiency could be heavily affected by regulation and other corporate governance practices. The results further showed that the determinants of technical efficiency were loans, capitalization and securities while, GDP and non-performing loans increase inefficiency. During the financial crisis of 1997 in Asia, Sufian (2010), compared the efficiency of the Malaysian and Thai banking sectors for the period 1992-2003 using a sample of 15 banks before and after the financial crisis applying the DEA methodology. The findings showed that Thai banks were more efficient than their Malaysian counterparts. The decline in efficiency was attributed to technical efficiency and the financial crisis.

Further, the results indicated a positive and significant relationship between efficiency and loans, ROA and deposits and a negative and significant relationship was obtained with loan loss provisions, bank size and non-interest income. On the other hand, the Thai banks were showed a positive relationship between efficiency and bank size, loan loss provisions and capital ratio. Therefore, it is noteworthy that efficiency, the measure of the bank's ability to translate its financial resources into mission related activities, is desirable in all organizations and in this case, banks, regardless of individual mission or structure.

It measures the intensity with which a business uses its assets to generate gross revenues and the effectiveness of production, purchasing, pricing, financing and marketing decisions. The determinants of financial intermediation efficiency of banks can broadly be categorized into endogenous and exogenous factors. The endogenous characteristics are those directly linked with managerial decision making processes and can be influenced to achieve a desired objective. This include; financial management efficiency, financial services efficiency financial information efficiency and corporate governance structure efficiency.

Among others, financial management efficiency can be described by other innate attributes such as the bank size, capital adequacy ratio, loans intensity, Liquidity or credit risk, market capitalization, financial leverage, deposit ratio and the operating leverage. Similarly, financial services efficiency is depicted through the customer experience in the uptake of the banking services, while financial information

efficiency is determined by the cost of access to financial services such as interest rates charged, transaction costs and timely release and sharing of financial information. Lastly, corporate governance structure efficiency was measured by board structure and composition, Transparency and Disclosure and Corporate Governance Practices.

2.5 Critique of existing Literature

The concept of financial intermediation efficiency in the banking sector, has been researched large and wide, by many academicians with mixed findings. The studies are also domiciled in the developed western world. Alrafadi et al. (2014), and Arora (2014), used the Data Envelopment Analysis Methodology to measure financial intermediation efficiency of commercial banks. Other researchers who adopted this approach include; Kamau (2011) and Nasieku et al. (2013), in Kenya. They cited the ease of operational functionality of the non-parametric DEA model, making it a popular model among most researchers.

The DEA allows the estimation of the cost, revenue and profit efficiency changes and their components. The ability of the model to decompose the components enables a deeper analysis of performance and efficiency drivers for the banks. Cost efficiency determines the managerial ability to minimize cost at a given level of output.

Lema (2017), used the DEA model to assess the Determinants of Bank Technical Efficiency in Ethiopia. Similarly, Novickyte and Drozdz (2018), used the DEA model in Measuring the efficiency in the Lithuanian banking sector. Other studies which adopted the Non parametric DEA included; Karray and Chichti (2013), Sufian and Habibullah (2014) and Maghyereh & Awartani (2014), among others. The results on the effect of financial intermediation efficiency on performance and the determinants of the bank efficiency as indicated in the literature provide mixed and varied conflicting results. Othman et al. (2014), found a negative relationship between capital adequacy and intermediation efficiency, a finding supported by Sufian (200). However, Odunga et al. (2013), found a positive relationship between liquidity and intermediation efficiency. The varied and conflicting results provide a

basis for the analysis of the effect of financial intermediation efficiency on the performance of commercial banks from the Kenyan perspective.

2.6 Research Gaps

From the literature reviewed, it is apparent that studies have been conducted on the concept of financial intermediation efficiency, while applying the intermediation approach in the banking sector. Gaps emerge that this study sought to fill, prominently, the studies in literature did not analyze the effect of financial intermediation efficiency on performance as most used ratio analysis. Odunga et al. (2013), studied credit risk, capital adequacy and operating efficiency of commercial banks in Kenya. The findings showed that credit risk had a significant effect on operating efficiency of commercial in Kenya. They further indicate that, banks with high liquidity maybe more efficient, in that they demonstrate ability to produce more output inform.

Following this finding, they recommended that higher degree of supervision should be employed to manage credit risk and mitigate agency problems between shareholders and managers. This study failed to articulate the effect of operating efficiency on performance of the banking sector.

Kamau (2011), investigated the Intermediation efficiency and productivity of the banking sector in Kenya, applying the DEA methodology. This study did not consider aspects of efficiency such as governance, information and service efficiency. Ntwiga (2020), studied if Fintech and Banks Collaboration has an influence on Technical Efficiency of Banks in Kenya. This study provides the prospective impact of technology on efficiency in the banking sector. The findings indicate managerial inefficiencies and poor utilization of inputs as pointers to the technical inefficiencies witnessed. This study did not analyze the connection between Fintech, efficiency and performance of the banking sector.

The current study therefore fills this gap by analyzing the effect of financial intermediation efficiency on performance. Similarly, Nasieku (2014), studied the Basel Capital Adequacy Framework and Economic Efficiency of Commercial Banks

in Kenya, using the DEA approach. The study gives the insight into the importance maintaining a strong and robust capital base by the banks. The findings showed that intermediation efficiency was affected by the level of capital maintained by the bank. Ntwiga (2019), studied whether Fintech and Bank collaboration influenced efficiency in the banking sector. The findings showed that Fintech plays a key role in efficiency enhancement in the banking sector. Whereas Fintech and bank collaboration are exogenous, the current study focused on bank specific attributes in analysing the effect of financial intermediation efficiency on performance.

Adusei (2016), studied the determinants of technical efficiency in rural and community banks in Ghana, applying the binary logit model. The results showed that return on assets had positive and significant effect on technical efficiency.

The findings further revealed that bank size, credit risk and capitalization had a negative and significant effect on technical efficiency. This finding is inconsistent with Nasieku (2014), who found that capital adequacy has a positive effect on technical efficiency. Therefore, whereas it is evident that, studies on financial intermediation efficiency in the banking sector in Kenya have been undertaken, it is apparent from the literature that, mixed findings are revealed. The study by Tesfay (2016), focused on the determinants of commercial Banks efficiency in Ethiopia over the period 2003–2012 using Tobit model. The findings showed that deposit liquidity had a positive and significant effect on bank efficiency. The results further showed that bank size, has a negative and significant effect on bank efficiency. Despite this finding, it is not apparent the influence of efficiency on performance of the banking sector.

The study did not incorporate other variables such as capitalization and leverage, a gap the current study endeavoured to plug. Similarly, the phenomenon on the effect of financial intermediation efficiency on performance of commercial banks listed on the Nairobi securities exchange is lacking. This provides a watershed gap in literature, since it is not clear whether banks depicting high financial intermediation efficiency also present high performance or financial intermediation inefficiency is akin to poor performance. Therefore, this study forms a strong basis to add to the

literature and the debate on financial intermediation efficiency, from the Kenyan perspective. This is supported by the fact that developing countries, Kenyan being one of them, are known for highly inefficient banking sector and financial intermediation problems, resulting in losses to financial development and instabilities in the financial system. Consequently, research in different environmental and economic conditions, may help in the achievement of an efficient banking system.

2.7 Summary

The literature reviewed so far bring to the fore fascinating yet important aspects of intermediation efficiency of commercial banks around the world and Kenya in particular, thus laying a solid ground for this study. The intermediation role of commercial banks plays a critical role in the economic growth and development, with the level of their operational efficiency being significant, yet a proper understanding of the determinants of their intermediation efficiency is still lacking. There is similarly no appropriate model or approach to identify these determinants for subsequent implementation by management. In order to achieve the going, concern objective, banks must be and remain profitable to survive. However, bank survival does not depend on the amount of profit it generates but on the efficiency with which these profits are made. Suffice to say, more profitable banks are not necessarily efficient.

Similarly, the literature does not reveal whether large banks by capitalization and market share can be associated with high levels of efficiency, an apparent gap that this study will seek to fill. Although most studies in the literature concentrated on endogenous factors determining bank efficiency, this study widens its scope to also incorporate a few exogenous indicators of bank efficiency.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section explains the technical procedures employed in this study. The chapter addresses the research design, target population, sampling frame and techniques, instruments for data collection, procedures and the type of analyses used. The chapter creates the philosophy the methodology that guided the research in a systematic and coherent manner.

3.2 Research Design

The study adopted the mixed research design. The approach involved the process of collecting data in order to answer questions regarding the current status of the subjects in the study (Mugenda & Mugenda, 2003). A descriptive survey design seeks to portray accurately the characteristics of a particular individual, situation or a group (Orodho, 2003, Kothari, 2004). The design has been applied in many similar studies. Ngumi (2013), used this design, to study the effect of bank innovations on financial performance of commercial banks in Kenya. Therefore, descriptive research design is the most appropriate for this study because it targets a number of respondents, who are geographically dispersed, in which case, to collect information from such respondents, this design becomes more appropriate. The design employed the use of various statistical tools to collect and analyze the data. Further, the study employed multivariate regression for analysis to test the relationship between the response variable and the predictor variables.

3.3 Target population

Zikmund et al. (2010), define population as, all items in any field of inquiry. Further, population is any finite or infinite collection of individual elements (Lavrakas,2008). According to Hyndman (2008), a population refers to the entire collection of ‘things’ in which the researcher is interested.

Therefore, the target population for this study comprised all commercial banks listed on the Nairobi Securities Exchange (NSE) for the period 2006 to 2017. For these institutions, the senior management employees were purposively targeted because they are responsible for the performance of their organizations and have a strong conviction on the influence of efficiency on financial performance. The period of study is considered significant because it is a period in which the financial system experienced rapid growth and most commercial banks got listed on the stock market. Most of the commercial banks also experienced changes in bank specific, market, macroeconomic and governance characteristics as a result of changes in regulatory requirements, competition and macroeconomic conditions. Within the same period, banks experienced exponential increase in branch network and product offerings, due to globalization and advancement in information technology, which greatly affected their scale efficiency. This period also, saw developments in new inventions such as mobile phone and internet banking, deposit taking or cash acceptance ATM machines among other developments.

Table 3.1: Target Population

S/No.	Bank	Branches
1	Equity Bank Group	174
2	Barclays Bank Kenya	146
3	Cooperative Bank	152
4	I&M Bank Ltd	34
5	KCB Group	213
6	National Bank Ltd	88
7	NIC Bank Ltd	28
8	Diamond Trust Bank Ltd	54
9	CFC Stanbic Bank Ltd	30
10	Standard Chartered Bank	47
	Total	**966**

Source: Kenya Bankers Association, 2017

3.4 Sampling Frame

According to Lavrakas (2008), a sampling frame is a list of the target population from which the sample is selected, which is usually finite in nature. Thus, for this

study, the sampling frame comprised all the licensed commercial banks excluding mortgage finance institutions, listed on the Nairobi Securities exchange as of 31st December 2017, and as contained in the Central Bank of Kenya (CBK) Database and NSE database (See Appendix 3). The central bank supervision report 2017 also provided disaggregated data on employees in the banking sector, from which the sample on senior management employees was drawn. Strictly, the Branch manager, Operations Manager and the Branch Accountant of the selected banks were the main respondents.

3.5 Sample and Sampling Techniques

A sample is a section of the population taken for investigation. Kombo and Tromp (2009) describe a sample as being a collection of units chosen from the population (universe). Further, Lavrakas (2008) describes a sample as a subset of elements drawn from a larger population. Use of a sample in research is cost effective (Polit and Beck, 2003). Although various methods of obtaining a sample exist, the techniques vary in terms of cost effectiveness and skills required for application. This study will therefore adopt both simple random sampling and the purposive or judgmental sampling technique to identify the units to be included in the sample. Simple random sampling will be used to identify the number of branches each bank will contribute to the sample for study. Purposive or judgmental sampling will then be applied to select the respondents from each bank branch. According to Yang and Miller (2008), purposive sampling involves deliberate selection of particular units of the population or universe to constitute a sample that represents the population. Purposive sampling is also known as expert sampling and is aimed at producing a sample that can logically represent a cross-section of the population without involving probability. The method enables the researcher to select subjects that will provide exhaustive information about the problem under study. In this connection, the method is applied in selecting the respondents from each branch. For the overall study sample, Mora and Kloet (2010) formula for sample size determination was applied.

$$n = N \big/ 1 + N(e^2)$$

Where;

N Population of study

n Sample size

e Is the margin of error or error confidence level 0.05

Therefore, the sample size for this study will be

966/1+966(0.0025) = 283

Table 3.2: Sample selection using proportionate sampling

S/No.	Bank	No. of Branches	Sample
1	Equity Bank	174	51
2	Barclays Bank	146	43
3	Cooperative Bank	152	45
4	I&M Bank Ltd	34	10
5	KCB Group	213	61
6	National Bank Ltd	88	26
7	NIC Bank Ltd	28	8
8	Diamond Trust	54	16
9	CFC Stanbic Ltd	30	9
10	Stanchart Ltd	47	14
	Total	**966**	**283**

Source: Author Calculation, 2017

3.6 Data Collection Methods

The instruments used for this study were questionnaires and secondary data collection sheets. Therefore, both primary and secondary data was used for this study.

3.6.1 Primary Data

Primary data provided a rich source for qualitative analysis for this study. According to Louis et al. (2007), primary data refers to those items that are original to the problem under investigation. Similarly, Ember and Ember (2009) describe primary

data as data collected by the investigator in various field sites explicitly for a comparative study. The data was collected using a questionnaire in appendix 2. According to Schwab (2005), a questionnaire is a measuring instrument that asks individuals to answer a set of questions or a respondent to a set of statements of particular interest to the researcher. Similarly, Mugenda and Mugenda (2003) and Kothari (2004) define a questionnaire as a document that consists of a number of questions printed or typed in a definite order on a form or set of forms. Questionnaires maybe closed-ended, open-ended or a combination of both (Dawson, 2002). This study adopted a closed ended questionnaire in order to ensure objectivity and facilitate analysis. The qualitative efficiency requiring primary data included financial services efficiency, financial management efficiency, financial information efficiency and corporate governance structural efficiency. Due to the technical nature of the responses sought, the questionnaires were purposively issued personally to the respondents to ensure that clarification is given on areas requiring so. The approach also ensured that a high response rate is achieved. The objective of using the questionnaire was to obtain information on the qualitative efficiency aspects as experienced in the achievement of improved performance of commercial banks in Kenya.

3.6.2 Secondary Data

Secondary data was obtained from the financial statements, independent audit reports, prospectuses and the Nairobi Securities Exchange Handbook available from the NSE. The data was collected for the period 2006 to 2017. Dawson (2002) defines secondary as being data collected using information from studies already undertaken by other researchers on the same subject. Similarly, Ember and Ember (2009) describe secondary data as data already collected by others for research or other purposes. Content analysis methodology is then applied to extract information from the financial statements. Before the data is analyzed, cleaning was necessary to ensure that only relevant data is used. The data was then verified and authenticated to ensure accuracy and reliability. The data was critical for computing the technical efficiency (TE) and scale efficiency (SE)scores for the banking sector in Kenya.

Other variables computed from the data included return on assets (ROA), return on equity (ROE), Bank size, Market capitalization and Liquidity risk.

3.7 Pilot study

This was undertaken to test the validity and reliability of the questionnaire in collecting primary data required for the study. The study covered selected non listed commercial banks. According to Kombo and Tromp (2009) and Kothari (2004), a pilot test is a replica and rehearsal of the main study. Pilot testing assisted in determine if the questionnaire was to obtain the required results (Dawson,2002). The questionnaires were then validated through discussion with three randomly selected managers whose views were then incorporated to enhance the content and construct validity of the questionnaire. Reliability of the questionnaires were determined by computing the Cronbach's alpha correlation coefficient. According to Sekaran,and Bougie (2009), a Cronbach's alpha coefficient closer to 1, implies higher internal consistency and reliability and a coefficient of 0.7 is recommended for a newly developed questionnaire. For this research, the pilot study returned the following

3.8 Data Processing and Analysis

Due to the large amount of data that was collected for this study, multiple statistical tools and techniques were adopted for data processing and analysis. The methods included simple computation of averages and the application of regression analysis to measure the relationships among the variables under investigation and quantifying the impact of several independent variables on a given dependent variable. Polit and Beck (2003) contend that the emergence of computers have made data processing easy and interesting. Therefore, since more than one predictor variable is involved in this study, multiple regression analysis was used. According to Faraway (2002), multiple linear regressions are used in situations where the number of independent variables is more than one. Further, International Business Machines (IBM) (2010), point out however that when using multiple linear regression analysis, the assumptions of linear regression must be met by the data to be analyzed. That is, the coefficients must be linear in nature; the response errors follow a normal and common distribution.

Regression analysis is an important tool for assessing the relationship among variables to ascertain the causal effect of one variable upon another. Further, regression analysis facilitates the testing of the significance of the relationships established among variables i.e. that the estimated relationship is close or equal to the actual relationship. According to Jackson (2009), multiple regression analysis involves combining several predictor variables in a single regression equation thus enabling the assessment of the effects of multiple predictor variables on the dependent variable.

3.8.1 Data envelopment analysis (DEA) Model

This is a non-parametric statistical method, used to measure firm efficiency. The model can be traced back to Charnes et al. (1978), based on the works of Farrell (1957), from which the CCR model, the basic form of the DEA model was developed. The advanced form of the model was later developed by Banker et al. (1984), who modified the basic form of the model, to accommodate the variable returns to scale, thus adopting the BCC identity.

The method is a mathematical programming technique, that provides and measures the efficiency of a decision-making unit (DMU), relative to other comparable DMUs with a modest restriction, that all DMUs lie on or below the efficiency frontier. Specifically, the DEA is a methodology for analysis of the relative efficiency for multiple inputs and outputs, by evaluation of all DMUs, and measurement of their performance with reference, to the best practice firms operating on the efficiency frontier.

The advantage of the model is that; it does not require the assumptions of the production function's analytical form and has applicability in a wide range of sectors, such as education banking, health among others. However, its main disadvantage is that it is sensitive to extreme observations, and does not decay, the banks deviation from the efficient production frontier into inefficient and random error components. The model calculates the relative efficiency of each DMU using the actual observed values for the inputs and output. Further, it identifies, the sources and level of

inefficiency, for each of the inputs and outputs of an inefficient unit (Charnes et al., 1978).

With specific reference to the banking sector, the DEA methodology has been used by many researchers, to analyze the relative efficiency of commercial banks. Mihailović (2016), used DEA and the I-Distance models to compute efficiency of banks in Serbia. Adusei (2016), applied the DEA approach to analyze the Technical Efficiency of Rural and Community Banks in Ghana. He opines that, the choice of the DEA model is due to its superiority to parametric methods. This view, is further reinforced by LaPlante and Paradi (2015), who provide that, the DEA model does not require prior assumptions on the distribution of observations. The Data Envelopment Analysis method measures the relative efficiency of firms and does not require a particular functional form, so as to estimate the efficiency of a decision making unit, like is the case with other parametric approaches (Hassan, 2009). This attribute makes the model popular with many researchers.

This study adopted the input oriented DEA model to analyze bank efficiency. The theoretical disposition for this is that, under both Constant Return to Scale (CRS) and Variable Return to Scale (VRS) assumptions, the model puts more emphasis on the managers' ability to control the amount of inputs used to produce a given amount of output. That is, reduction in inputs while maintaining at least the current level of output (Savić & Radosavljević, 2012). Based on the Technical Efficiency scores under the VRS and the CRS models, the Scale efficiency was computed.

Table: 3.3: Input-Output selection for DEA analysis

Inputs	Outputs
Total Deposits	Total Loans
Total operating Expenses	Other income
Interest expenses	Interest income

3.8.2 DEA Model Description and specification

There are various specifications of the DEA model, however, the frequently used ones include the CCR model and the BCC models. The CCR-model was developed

by Charnes, Cooper and Rhodes (Charnes et al., (1978)), with a specific assumption that, the DMU operates under constant returns to scale (CRS). On the other hand, the BCC-model was defined by Banker, Charnes and Cooper (Banker et al., (1984)), and estimates the efficiency under the assumption of variable returns to scale (VRS). From the foregoing, efficiency may be defined as the determination to obtain the highest output possible, by preferring the method that uses the input composition in the most productive way.

Assuming a decision making unit (DMU) generates the outputs Y_i = i = 1,2,3, ,4 … … … n, from the inputs X_k = k = 1,2,3, ,4 … … … m, then equation can be expressed in the following way by help of the appropriate weights (Vi= i = 1, 2, 3 ,4 … …. n) and (W_k = i = 1, 2, 3 ,4 … …. m) on the variables, considering all variables, output and input ratios. Therefore, under the standard DEA approach, the efficiency of bank i is defined as the ratio of the sum of weighted outputs to the weighted sum of inputs.

Thus, these may be expressed as follows:

Efficiency of bank, i = (Weighted sum of bank i's outputs)

(Weighted sum of bank i's inputs)

Procedurally, the DEA model can be described through the original model developed by Charnes, Cooper and Rhodes. Consider a DMU, that convert I inputs into J outputs, where; I can be larger, equal or smaller than J. The efficiency of this conversion process for the DMU, is the maximum of the ratio of weighted outputs to weighted inputs for that unit, subject to the condition that the similar ratios for all other DMUs be less than or equal to one.

That is, $$Max\theta = \frac{\sum_{j=1}^{J} u_j^{o} y_j^{o}}{\sum_{i=1}^{I} v_i^{o} x_i^{o}}$$ …… (a)

Subject to $\frac{\sum_{j=1}^{J} u_j^0 y_j^0}{\sum_{i=1}^{I} v_i^0 x_i^0} \leq 1$

The maximum of the objective function θ given by the equation (a) is the DEA efficiency score assigned to the respective DMU. Therefore, if θ=1, the DMU satisfies the necessary condition of efficiency otherwise it is inefficient. Notice that the objective function stated in (a) is non-linear and fractional, making it difficult to solve.

Charnes et al. (1978), developed a transformed version of the above non-linear programming problem into a linear version so as to ensure it can be solved as a linear programming problem as follows:

That is,

$$Max\phi = \sum_{j=1}^{J} u_j^0 y_j^0 \quad \text{..... (b)}$$

Subject to: $\sum_{i=1}^{I} v_i^0 x_i^0 = 1; \sum_{j=1}^{J} u_j^0 y_j^n - \sum_{i=1}^{I} v_i^0 x_i^n \leq 0$

Where, $n = 1,...N; v_i^0, u_j^0 \geq \varepsilon; i = 1,...,I; j = 1,...,J$

Admittedly, the two model specifications, (a) and (b) are the same, except that model (b) has a condition that ensures that all the known inputs and outputs have a positive weight values and that the optimal objective function of the dual problem to problem (b) is not affected by the values assigned to the dual slack variables for each DMU.

3.8.3 Econometric Model Specifications

The regression method was used to analyze the relationship between financial performance, as a dependent variable, and intermediation efficiency, described by the independent variables. Each objective of the study was analyzed using an

independent regression model. In the first objective, we are interested in determining the effect of bank overall efficiency on financial performance.

The following general regression model is specified as follows:

Y=f (Eff)

$$Y_{it} = \beta_0 + \beta_{i1}FME_{i1} + \beta i_2 CGSE_{i2+} \beta i_3 FSE_{i3} + \beta_{i4}FIE_{i4+} \varepsilon_{it} \quad (1)$$

Where Y_{it} = Financial Performance of Bank *i* at time *t*, using, ROA and ROE as proxies

β_0 = Intercept

$\beta_1 - \beta_4$ = Parameters or coefficients

FME_{it} = Financial Management Efficiency of bank *i* at time *t*

$CGSE_{it}$ = Corporate Governance Structural Efficiency of bank *i* at time *t*

FSE_{it} = Financial Services Efficiency of Bank *i* at time *t*

FIE_{it} = Financial Information Efficiency of Bank *i* at time *t*

ε_{it} = Error term of bank *i* at time *t*

The study further sought to examine the effect of Technical Efficiency (TE) and Scale Efficiency (SE) on the financial performance of commercial banks and evaluate the determinants of banking efficiency using the secondary data. The aim is to corroborate the outcome of the analysis carried out using the primary data obtained.

Below, we describe the approaches adopted in this study. First, we evaluate the effect of Technical and Scale Efficiency on financial performance. The following regression model is specified;

$$Y_{it} = \alpha_0 + \alpha_1 TEit + \alpha_2 SE_{it+} \varepsilon_{it} \quad (2)$$

Where Y_{it} = Financial Performance of Bank *i* at time *t*, using, ROA and ROE as proxies, α_0 = Intercept, $\alpha_1 - \alpha_2$ = Parameters or coefficients, TE_{it} = Technical efficiency of bank *i* at time *t*, SE_{it} =Scale efficiency of bank i at time t, ε_{it} = Error term of bank *i* at time *t*.

The TE is measured under two assumptions; variable returns to scale (VRS) and Constant returns to scale (CRS).

The CRS assumption in CCR model restricts its application to efficiency studies and is suitable only when all firms are operating at an optimal scale, hence easily comparable in terms of their operations (Kumar and Achana, 2015). However, in a market driven economy where competition, price differences and constraints with resources are present, all firms may not be operating at optimal scale. Hence, Banker et al. (1984) proposed the BCC DEA model for the firms operating under variable returns to scale (VRS) assumption.

Under the CCR model, the technical efficiency calculated is comprised of both technical efficiency and scale efficiency. However, the BCC model decomposes the technical efficiency obtained from CCR model into technical efficiency and scale efficiency by relaxing the CRS assumption in the model.

The BCC model can be applied to multiple inputs and multiple outputs (Kumar and Achana, 2015). Secondly, in order to measure and evaluate the determinants of bank efficiency as envisaged in the fifth objective, the truncated (censored) Tobit regression model was applied. This is because, efficiency values are restricted to between 0 and 1, and therefore use of the ordinary least squares(OLS) or generalized regression models (GMM) would be misleading.

The basic regression equation is specified as follows

$$(Eff) = \beta_{i0} + \beta_{i1}X_{i1} + \beta_{i2}X_{i2} + \beta_{i3}X_{i3} + \beta_{i4}X_{i4} + \beta_{i5}X_{i5} + \varepsilon_{it} \quad (3)$$

Where: Eff. Represents Bank Efficiency, X_{i1}, Bank Size, X_{i2}, Capital Adequacy, $X_{i3,}$ Liquidity Risk, $X_{i4,}$ Market Capitalization and X_{i5} is the leverage. β_{i0} is the constant

and $\beta_{i1} - \beta_{i5}$ are coefficients and ε is the error term, i represents the banks identifier, t is the time dimension of the data.

After identifying the determinants of banking efficiency, we further evaluate their effect on the financial performance of the bank. In the third objective, we evaluate whether the determinants of bank efficiency have an influence on financial performance. To realize this objective, the following regression equation is used.

3.8.4 Variable Measurement and Operationalization

With respect to the fourth objective, we require to determine the effect of qualitative efficiency characteristics of the bank on its financial performance. The data requirements will be obtained from the questionnaires. The average value of each of the qualitative aspect will be applied in the regression model to determine the relationship.

Table 3.4: Variable measurement and operationalization

Variable	Variable Type	Description	Analysis Level	Operationalization
Technical Efficiency (TE)	Dependent	The resource utilization capacity of the bank. It describes the ability of the firm to produce maximum output out of a given set of inputs	Descriptive	Computed using the DEA model and used as the response variable in testing the effect of bank performance on efficiency.
Scale Efficiency (SE)	Dependent	The product of Efficiency under the VRS and CRS models	Quantitative	Computed using the DEA model and used as the response variable in testing the effect of bank performance on efficiency.
Bank Size	Independent	Quantitative	Quantitative	Logarithm of Total Assets
Capital Adequacy	Independent	The portion of a banks' equity capital expected to absorb any potential losses and risk eg credit risk and market risk.	Quantitative	Total Equity divided by Total Assets
Liquidity Risk	Independent	Quantitative	Quantitative	Ratio of total loans to total deposits
Market Capitalization	Independent	Quantitative	Quantitative	Closing share price x outstanding shares at the end of the year
Return on Assets (ROA)	Dependent	Quantitative	Quantitative	The ratio of Net income to Total assets of the bank
Return on Equity (ROE)	Dependent	Quantitative	Quantitative	The ratio of Net income to Average Equity of the bank
Financial performance	Dependent	The measure of how well a firm can use assets from its primary mode of business to generate revenues. A measure of a firm's general financial health	Quantitative	Measured using return on assets, and return on equity as proxies
Financial information efficiency	Independent	The measure of effectiveness that produces the minimum waste of time, effort, and skill in the dissemination of	Quantitative	The cost of financial information, The effectiveness and speed of borrower information sharing, The quality and reliability of financial information

		financial information.		
Financial Services efficiency	Independent	Reliability, dependability and effectiveness of delivery of banking services through various platforms	Quantitative	Number of financial innovations in use; ATMs, POS, EFT, Debit & Credit cards, Mobile phone banking users, internet banking users. The price level and cost of the said services and performance, Customer transaction management and access.
Financial management efficiency	Independent	The effectiveness with which the resources of the bank are managed to generate more revenues and profits	Quantitative	The Capital adequacy, Liquidity, Market Capitalization, Bank Size, Deposit mobilization and turnover rate, Adherence to operational cash limit (float)
Corporate governance structural efficiency	Independent	The ability of the set of mechanisms designed to mitigate agency problems that arise from the separation of ownership and control in a firm to protect the interests of all stakeholders, improve firm performance, and ensure that investors get an adequate return on their investment	Quantitative	Board size will be measured by the total number of members of the board of the bank, while board composition & independence will be measured by the number of independent board members (External) and internal directors sitting on the board. Board shareholding will be measured by the percentage shareholding of the board members in the equity of the bank. Transparency and Governance Practices

3.8.5 Model Assumptions

Diagnostic tests were carried out to ensure that the data suits the basic assumptions of classical linear regression model on normality. To check for normality, descriptive statistics were used. Kurtosis and Skewness of the distribution of the data was examined to test for normality. Similarly, the problem of mulita-collinearity was tested. The existence of strong correlation between the independent variables was tested using Variance Inflation Factor (VIF) and correlation coefficient. Scores of 10 and 0.8 for VIF and correlation coefficient respectively show the existence of multi-collinearity. Further, tests for heteroscedasticity were carried out to avoid the problem of heteroscedasticity of disturbance.

3.8.6 Model adequacy and robustness check

To check for normality Jarque-Bera test (JB) was applied. The test is based on residuals of the least squares regression model. The following formula will be used to test for the normality:

$$JB = N\left[\frac{S^2}{6} + \frac{(K-3)^2}{24}\right] \text{.....6}$$

Where: N=sample size, S=skewness coefficient and K=kurtosis coefficient. For normal distribution JB statistics is expected to be zero (Gujarati and Sangeetha, 2008). The existence of the problem of multi-collinearity will be tested using correlation coefficient test and VIF. A correlation above 0.8 between independent variables indicates the existence of the problem of multi-collinearity (Gujarati and Sangeetha, 2008)

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results and discussions with respect to the objectives and research suppositions of the study. The results are both descriptive and inferential in nature and are based on the models highlighted and adopted for the study.

4.2 Pilot Study

The pilot test results of the study are presented based on the outcome of simulated data collected using the research instrument developed for this study. The pilot study aimed at determining the internal consistency of the measures of bank performance, financial management efficiency, financial information efficiency, financial services efficiency and corporate governance structural efficiency.

The pilot test of the questionnaire was conducted to determine its working characteristics and to ensure that the questionnaire is adequately constructed, with respect to the external and internal consistency of the interrogations. The key features of interest in the pilot phase were the format and intelligibility of the questions. The consistency of the respondents' interpretation of the questions was also tested. The questionnaires were personally administered to ensure the key aspects of concern are addressed. Further, it ensured that the respondents were able to conveniently fill out the questionnaire within a reasonable time frame. Similarly, understandability, relevance, reliability and comparability facets of the questionnaire with respect to the variables under study were tested. Table 4.1 indicates the pilot test results.

Table 4.1: Cronbach Alphas' Reliability Statistics

Code	Variable	Cronbach's Alpha	Number of Items	Remarks
A4.1 – A4.4	Concept of Efficiency	0.930	4	Accepted
B1 – B9	Financial Management Efficiency	0.933	9	Accepted
CA1 – CA11	Corporate Governance Structural Efficiency	0.931	23	Accepted
D1 – D9	Financial Services Efficiency	0.876	9	Accepted
E1 – E9	Financial Information Efficiency	0.953	9	Accepted

The findings of the pre-test, of the research instrument show that the questions used in measuring the variables were internally consistent. According to Sekran and Bougie (2009), a Cronbach's Alpha coefficient closer to 1, implies higher internal consistency and reliability, and a coefficient of at least 0.7 is recommended for a newly developed Questionnaire. Caliendo (2015), indicate that higher values of Cronbach's Alpha indicate high reliability and internal consistency in the research instrument. From the above findings, all the variables had a Cronbach's Alpha of more than 0.7 and were therefore accepted for the research data collection process.

4.3 Banking efficiency Descriptive statistics

The descriptive and inferential statistics are analyzed with respect to the variables under investigation. Firstly, the concept of banking efficiency was analyzed in general with the main outcome being the understanding of this concept by the banking sector players. This background analysis was critical in determining the level of grasp of the concept and its applicability dimensions in the banking sector in Kenya. The results are indicated in Table 4.2.

Table 4.2: Banking Efficiency Descriptive statistics

Concept of Bank efficiency	N	SD(%)	D(%)	N(%)	A (%)	SA (%)	Mean	Std. Deviation
The bank's ability to perform optimally, procedures involved in converting a set of inputs into outputs	258	0	25.6	15.1	33.70	25.60	3.5930	1.12673
Bank's effectiveness that produces minimum waste of resources; time, effort, skill, finances, technology	258	0	25.6	22.9	32.60	19.00	3.4496	1.06928
The extent to which the bank can achieve optimal scale of operation by altering its size and inputs for maximum output.	258	0	11.6	9.3	47.30	31.80	3.9922	.93772
The bank's ability to generate and sustain high levels of profitability	258	0	1.6	8	32.90	64.70	4.6085	.59000

The study sought to establish the sector understanding of efficiency as being the ability to optimally utilize a set of procedures effectively to convert bank inputs; total deposits, operating expenses (OPEX), interest expenses among others to generate outputs; total loans, interest income and other income to achieve improved performance of the bank. The results indicate that 33.7% and 25.6% of the respondents agreed and strongly agreed respectively on this definition of bank efficiency with a mean of 3.593 and a standard deviation of 1.127. From Table 4.2, this definition has the highest deviation from the mean comparatively.

Secondly, the study sought to assess the sector understanding of efficiency as the effectiveness that produces minimum waste of resources; time, effort, skill, finances, and technology. The results showed that 32.6% and 19% agreed and strongly agreed respectively with this definition with a mean of 3.449 and a standard deviation of 1.0693. Thirdly, the study examined the sector understanding of the efficiency as the extent to which the bank can achieve optimal scale of operation by altering its size and inputs for maximum output. The idea here was to find out the viability of the current banking sector expansion programs through establishment of more branches and diversification of their products. The findings showed that 47.3% and 31.8% of

the respondents agreed and strongly agreed with this definition of bank efficiency respectively with a mean of 3.992 and a standard deviation of 0.937.

Finally, of the respondents, at least 64.7% strongly agreed that efficiency is the bank's ability to generate and sustain high profitability with a mean of 4.609 and a standard deviation of 0.590. This definitions of efficiency present a critical insight into the management practice in the banking sector in the country. From the findings, the last two definitions had the highest mean with the a very low standard deviation, implying that they are the most preferred. The banking sector performance is therefore directed by the efficiency approach adopted. From the analysis, it can be inferred that bank managers in the Kenyan banking industry are more inclined to the profit maximization objective as postulated in the conventional theory of the firm. They are also inclined to the achievement of increased scale of operation through branch network expansion and introduction of new products and services to boost their income streams.

4.4 Financial management efficiency

The study sought to analyze the internal attributes on financial management efficiency that depict the financial propriety of a bank. This traits are; bank size, measured by the bank's total assets and described as large banks in the research instrument, Capital adequacy and financial Leverage ratio that indicates the size of capital compared with the bank's total assets, that determines the sufficiency with which equity is able to absorb shocks that a bank may experience hence mitigate the risk bank failure out of a bank run, financial leverage, that measures the ability of the bank to use fixed financial charges to magnify the effects of changes in earnings before interest and tax (EBIT) on the earnings per share (EPS), Liquidity risk, also known as credit risk, ownership structure, Market capitalization, and bank age. The desirability of the attributes and the extent to which the regulators monitor and control indicate that they are aimed at ensuring efficient utilization of financial resources of the bank. Some of this facets depicted through the CAMEL ratios are closely monitored by the central to ensure strict compliance with financial

management requirements of the law and other regulations. The findings are indicated in Table 4.3.

4.4.1 Capital adequacy

The study sought to determine whether commercial banks in Kenya evaluate their capital adequacy requirements in line with the minimum capital requirements as required by the sector regulators to ensure stability in the financial sector. The findings indicate that maintaining capital adequacy requirements is extremely important in ensuring a stable financial sector. As indicated in Table 4.2 41.7% and 25% of the respondents agreed and strongly agreed with a mean of 3.667 and a standard deviation of 1.155. As opined by Apergis (2014), banks need to maintain more than minimum capital requirements to reduce the risk of insolvency.

From this angle, adequately capitalized banks are able to generate higher revenues and mobilize deposits, translating increased performance. This result is therefore consistent with Williams (2014), who contends that banks with higher capital adequacy ratios were more stable and are not exposed to the risk of insolvency. Similarly, the results are also consistent with Gardner (2012), who showed that banks with higher capital were more efficient than those with lower capital adequacy levels. The finding is also corroborated by Olweny and Shipho (2011) who find that capital adequacy as one of the bank specific factors, has a significant positive impact on bank performance, hence a critical component in evaluating performance.

4.4.2 Budgeting, Planning and Control

The study examined the budgeting, planning and control practice in the banking sector in Kenya. The findings indicate that this attribute of financial management efficiency was highly being practiced. From Table 4.2 33.3% and 66.7% of the respondents agreed and strongly agreed respectively on the use of budgets as a tool to ensure financial management efficiency. Budgeting and planning guides and directs the expenditure targeted to achieved the objectives and strategic direction of the bank. The results had a mean of 4.667 with a standard deviation of 0.492.

4.4.2 Liquidity risk and Credit risk

As banks accept demand deposits, liquidity becomes one single most important decision variable for many bank managers. The study sought to determine the level of liquidity and its adequacy as maintained by the commercial banks to support their daily operations. The findings indicate that 33.3% and 50% of the respondents' agreed and strongly agreed respectively on the need to maintain adequate liquidity to meet the daily cash demands by depositors.

With a mean of 4.333 and standard deviation of 0.778, the findings of this study are consistent with Chitan (2012), who found that liquidity risk had a negative impact on profitability, implying that bank efficiency is affected. As the banks main business is accepting deposits and advancing loans, the liquidity risk indicates the extent of lending risk from the bank. Reducing the lending risk leads to efficiency maximization as it ensures that bank clients are always able to access their deposits on demand. The results are therefore, consistent with Hou et al. (2014), who emphasized the need to reduce credit or liquidity risk in banking operations, since banks with higher liquidity or credit risk exposure use borrowed funds rather than customer deposits for lending leading to cost inefficiency occasioned by increased finance costs.

Similarly, Kamau (2009), held that the opportunity cost of holding high liquidity is the potential high return investments that the bank would otherwise have undertaken. High liquidity ratios are indicators of less risk and low profitability. This phenomenon puts the bank managers in a dilemma as to which strategy to pursue. Liquidity risk management is therefore a complex managerial decision that need to be carefully considered due to its potential effect on the performance of the bank. Although increased liquidity increases the banks' ability to raise funds at short notice, it also reduces the ability by bank managers to commit credibly to an investment strategy that protects investors leading to the reduction in the firms' ability to raise external finance (Uzhegova, 2010).

4.4.3 Managerial Decisions

The study sought to examine the potency and effectiveness of managerial decisions on management of financial resources of the bank. The decisions may involve and complex array of matters relating to the organization but in particular, resource conceptualization and resource development.

Specifically, these decisions may relate to investment decisions, financing, Liquidity and earnings distribution decisions. These decisions provide the strategic direction of the bank and define the efficiency of its operations as they attract a huge opportunity cost. The results indicate that 33.3% and 50% of the respondents agreed and strongly agreed respectively that the managers were effective in financial decision making leading to better performance of the bank with a mean of 4.667 and standard deviation of 0.492. This finding indicates that the efficiency of managerial decision making is important in driving the strategic agenda and performance direction of the bank. The decisions however need to be carefully screened as they impact on the overall performance of the bank. Other operational decisions may include optimal staffing, technology adoption, training and capacity development, research and development (R&D) among others which influence on the efficiency of banking operations.

4.4.4 Bank Capitalization

On this parameter, the study sought to examine whether commercial banks' capitalization is geared towards the achievement of improved performance results. The results indicate that 50% agree while 33.3% of the respondents strongly agree that adequately capitalized banks are more profitable with a mean of 4.333 and a standard deviation of 0.492. This finding is consistent with Gavila *et al* (2009) who found that highly capitalized banks are more profitable than those with low capitalization. The study found that highly capitalized banks face less need for external financing hence reducing the degree of exposure to bankruptcy. Further, the results and consistent with the findings of Neceur (2003), Sufian and Chong (2008) who found that there is a strong and significant positive relationship between capitalization and return on assets of commercial banks. Contrarily, Beckmann

(2007) found that highly capitalized banks may realize low profitability as they present a high capital ratio which may render them to be risk averse with the tendency to ignore potential risky in investment decisions.

The findings are therefore able to distinguish the performance profiles of different banks in Kenya with respect to their capitalization profiles. However, bank capitalization need to be carefully managed. This is because in line with the conventional risk-return hypothesis, there is an inverse relationship between capitalization and profitability. Excessively capitalized banks could denote that a bank is operating too cautiously as to as to ignore potentially profitable investment opportunities leading to lower returns for investors.

4.4.5 Compliance with regulatory and prudential requirements

The study sought to determine the degree of compliance by banks to the prudential guidelines issued by the central bank and other regulatory bodies. In this regard, the study specifically addressed the capital adequacy requirement due to its critical nature in the operations of the bank. The results showed that 33.3% agreed and 66.7% strongly agreed that the bank complied with capital adequacy requirements as envisaged in the regulations. With a mean of 4.667 and standard deviation of 0.492, the low standard deviation reiterates the importance of compliance with regulatory requirements, confirming that the banking sector in Kenya endeavors to comply with the requisite rules and regulations.

4.4.6 Source of financing

The study sought to find out the main financing strategy adopted by the banks in Kenya. The results indicate that 33.3% and 41.7% of the respondents agreed and strongly agreed that cheaper financing sources were the most preferred. With a mean of 4.000 and standard deviation of 1.128, it implies that the banks' financing approach is that which is aimed at minimizing finance costs and improve performance. Thus, retained earnings and equity financing become more preferable. The funds obtained are directed towards investments that will enhance the profitability of the bank.

Therefore, as is the case with other parameters of banking operations, financial management efficiency is extremely important in driving the banks' performance. This aspect involves routine financial management decisions, compliance with capital requirements by regulatory bodies such as the central bank of Kenya (CBK), optimal liquidity, financing of operations among others. Bank managers should therefore promote financial management efficiency to guarantee improved performance.

Table 4.3: Financial management efficiency descriptive statistics

Financial Management Efficiency	SD(%)	D(%)	N(%)	A(%)	SA(%)	Mean	Std. Deviation
Adequately capitalized banks are more stable and profitable	0	25	8.3	41.7	25.00	3.6667	1.15470
Our bank adopts budgets and planning as a tool for improving financial management efficiency	0	0	0	33.3	66.70	4.6667	.49237
Our bank maintains optimal liquidity to meet on demand cash requirements of depositors	0	0	16.7	33.3	50.00	4.3333	.77850
Our bank management is effective in financial management decision making, contributing to better financial performance	0	0	0	33.3	66.70	4.6667	.49237
Our bank is adequately capitalized, hence growing profitability	0	0	16.7	50.0	33.30	4.3333	.49237
Our bank has complied with capital adequacy requirements of the central bank	0	0	0	33.3	66.70	4.6667	.49237
Our bank has a short receivables duration leading to better liquidity management	0	0	16.7	50.0	33.30	4.1667	.71774
Our bank obtains funds from the most cost effective source and utilizes it in the most profitable investments to enhance profitability	0	16.7	8.3	33.3	41.70	4.0000	1.12815

4.4.7 Bivariate Regression Analysis Descriptive statistics (BRADS)

The research used regression analysis to determine the linear statistical relationship between financial management efficiency and bank performance.

The null hypotheses as stated in chapter one were tested using the regression model to determine the effect of financial management efficiency on the performance of commercial banks in Kenya. The null hypothesis tested is stated as below:

H_{01}: Financial management efficiency has no significant effect on financial performance of commercial banks in Kenya.

The linear regression model showed R^2= 0.463 which means that a 46.3% change of financial performance of commercial banks in Kenya can be explained by a unit change in financial management efficiency. The result is shown in Table 4.4. From the results, there is an indication that one unit change in financial management efficiency translates to 46.3% change in financial performance of commercial banks in Kenya, while 53.9% can be attributed to other factors. From this finding, it is apparent that financial management efficiency in the banking sector is a critical component of managerial decision making to drive the performance of the bank. The need to develop strategies to strengthen financial management efficiency is therefore imperative for bank managers as this will guarantee positive performance.

Table 4.4: Model Summary of financial management efficiency

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.680[a]	.463	.461	3.25013

Further, the test on analysis of variance (ANOVA), showed that the significance of the F-statistic (-220.791) is less than 0.05 with p-value, p = 0.00. This result is indicated in table 4.5. This implies that, there is a positive and significant relationship between financial management efficiency and Financial Performance of commercial banks in Kenya.

Table 4.5: Analysis of Variance (ANOVA) of Financial Management Efficiency

Model		Sum Squares	ofDf	Mean Square	F	Sig.
1	Regression	2332.285	1	2332.285	-220.791	.000[b]
	Residual	2704.211	256	10.563		
	Total	5036.496	257			

Table 4.6 shows the results on the test of the beta coefficients of the resulting model. The constant β = 3.903, indicates that if the independent variable, financial management efficiency is held constant, then there will be a positive change in financial performance of commercial banks by 3.903. The regression coefficient for financial management efficiency was also positive and significant with a t-value, t = 14.859 supported by a p-value of p = 0.000, which is less than the conventional p = 0.05. This implies that for every 1-unit increase in financial management efficiency, financial performance of commercial banks is predicted to increase by 3.903 units and therefore the null hypothesis, H_{01} is rejected. This leads to the observation that there is a significant and positive relationship between financial management efficiency and bank performance.

Table 4.6: Co-efficient of financial management efficiency

Model		Unstandardized Coefficients		StandardizedT Coefficients		Sig.
		B	Std. Error	Beta		
1	(Constant)	3.903	1.157		3.373	.001
	Financial management Efficiency	.527	.035	.680	14.859	.000

4.5 Corporate Governance structural efficiency on financial performance

Empirical literature on corporate governance indicates that it is an imperative factor of bank performance (Diamond and Rajan 2009). The Basel Committee dealing with Banking Supervision (BCBS, 2006), emphasizes that, efficiency of corporate governance structure and practices, ought to be reflected in the confidence held by stakeholders in the banking sector. This confidence, guarantees and directs, the level of economic activity for the whole economy and performs a pivotal function in the

stability of the financial system. The failure of banking corporate governance mechanisms, can be strictly associated with financial crises experienced in the recent past. According to De Haan and Vlahu (2016), the failure of corporate governance among firms, is the primary cause of the financial crises.

Similarly, Kirkpatrick (2009), contends that the financial crises can, to a great extent be linked to the failures and flaws in the firms' corporate governance measures that do not safeguard against the risk appetite of managers. The findings in extant literature also show that banks with poor governance, are usually involved in disproportionate risk taking and have larger losses during a financial crisis (Beltratti and Stulz 2011). The explanation here is that, the risk tolerance of the managers maybe in conflict with that of the shareholders, whereby the managers pursue self-interests at the expense of the interest of the shareholders leading to serious agency problems. To this end, Ccorporate governance mechanisms become significantly important in the current complex business environment. They provide a framework in which banks are able to constantly improve their performance by alleviating the agency problem predisposition of the organization. Board structure and composition determine the strategic direction of the bank and its routine operational dynamics.

4.5.1 Board Structure, size and Composition

Board structure, size and composition, in line with good corporate governance practice, is critical for efficient management of organizations. Yasser et al., (2017) showed that there is a positive relationship between board structure and firm performance. Extant literature on corporate governance documents that, board size captures the quality of board monitoring (Botti, et al., 2014).

As such, directors serving on small boards, have fewer communication difficulties, allowing them to better coordinate their efforts in limiting managerial opportunistic behaviour (Botti et al., 2014). The results indicate that 42% of the respondents strongly agreed that their board of directors was lean, comprising less than nine members with mean of 3.6 and standard deviation of 1.6, while 16.7% strongly disagreed. These findings are consistent with Bushman et al. (2004) who argued that small boards are more likely to provide better quality information to outside

investors. This is because smaller boards are effective in managerial oversight, are associated with lower coordination costs, better exchange of ideas and less free riding among board members.

The findings are however inconsistent with Poudel and Hovey (2013) who argued that bigger board size and audit committee and lower frequency of board meetings led to better efficiency for commercial banks. According to Botti et al. (2014), the directors of smaller boards are more concerned about their responsibilities to ensure effective monitoring to guarantee high-quality corporate disclosure. Therefore, large boards increase the probability of low-quality information disclosure due to potential conflicts between multiple directors (Botti et al., 2014).

Therefore, as small boards are more likely to be associated with better supervision and monitoring of firm operations, this is in effect expected to be reflected in better information disclosure and improved efficiency and firm performance. Further, the study sought to determine whether the boards of commercial banks in Kenya are well constituted, to include independent board members. Independent boards, are effective in reducing managerial buccaneering and reduction in agency problems and associated costs. The inclusion of independent directors enhances independent monitoring of managerial behaviour.

The independent directors may suffer reputational risks if they are not accountable to the shareholders. They will therefore always put bank managers to task and ensure that the interests of the shareholders are protected. The findings indicate that 66.7% and 25% of the respondents agreed and strongly agreed that the board of directors comprised independent members. With a mean of 4.167 and standard deviation of 0.577, the presence of the independent board members cannot be overemphasized. The findings are consistent with Chen et al. (2008), who found a strong evidence that the presence of independent directors positively affects the extent of firm voluntary disclosure.

As a good corporate governance practice, financial reporting and information disclosure are important as it is an avenue where shareholders informativeness is guaranteed. Independent directors therefore ensure that managers provide as much

disclosure as possible to the shareholders. From these arguments, the need for independent directors is apparent in order to safeguard the interest of the shareholders. Similarly, Koh et al. (2007), provide that independent boards provide better monitoring thus enhancing firm performance and the value of financial reporting. Botti et al. (2014), intimate that, independent directors have strong incentive to diminish and mitigate the agency problem due to their drive to be accountable to the shareholders. They also facilitate the reduction in the problem of information asymmetry between management and shareholders due to the oversight function that they perform.

4.5.2 The role and functions of the board

The study sought to determine whether the roles and functions of the boards of directors were clearly defined and the potential impact of ambiguity in the roles of the board of directors and management. The findings showed that 66.7% of the respondents agreed while 33.3% strongly agreed that the roles of the board of directors were clearly defined with a mean of 4.3 and standard deviation of 0.5 implying that their decisions are strategically thought out hence impacting positively on bank performance.

Clearly defining the roles and functions of the board and management facilitates ease of operations and coordination of the strategic direction of the bank.

4.5.3 Duality of the role of the Chief Executive Officer

Definition of clear roles and functions of the board of directors is of paramount importance. This ensures that ambiguities in the running of the affairs of the bank are eliminated. The findings showed that 66.7% of the respondents agreed while 33.3% strongly agreed that the roles of the board of directors were clearly defined with a mean of 4.3 and standard deviation of 0.5 implying that their decisions are strategically thought out hence impacting positively on bank performance. Clearly defining the roles and functions of the board and management facilitates ease of operations and coordination of the strategic direction of the bank. Duality of the role of the Chief Executive Officer is an important corporate governance aspect causing

the problem of information asymmetry. Where the role of the CEO and that of the Chairman are not clearly separated, potential conflict of functions held by the same individual abound. The results indicate that 58.3% of the respondents agreed while 41.7% strongly agreed that there exists separation of the role of chairman and CEO of the bank with a mean of 4.417 and a standard deviation of 0.515.

This aspect of separation of the role of Chairman and Chief Executive provides the required control mechanisms that facilitates efficiency in decision making which impact on the overall financial performance of the bank as a result of prudent decision making. This could explain the stellar performance depicted by the banking sector in Kenya.

4.5.4 Board Meetings and Schedule

The study examined the whether board meetings are called regularly, and as scheduled. According to Fama & Jensen, (1983b), of the agency theory conjecture, the frequency of board meetings as a monitoring tool facilitates the attainment of better governance and improved firm performance. The stewardship philosophy on the other hand provides that board of meetings are irrelevant. According to this theory, monitoring of firm operations is an endogenous process influenced by factors outside of the firm. From this supposition, the relationship between the frequency of board meetings and firm performance maybe insignificant. However, Ntim and Osei (2011) found a positive and significant relationship between frequency of board meetings and firm performance. They argued that meetings provide a mechanism for monitoring which positively impacts on firm value.

The results of the study showed that 58.3% and 16.7% agreed and strongly agreed that board meetings were called as scheduled. Despite this general consensus among the respondents, 16.7% disagreed, implying that some banks boards did not follow the almanac of meetings which could impact negatively on performance. The results of the study are consistent with Eluyela et al. (2018), who found a positive and significant relationship between board meeting frequency and firm performance. As noted by Mohamed et al. (2016), board of directors is the most important mechanism of corporate governance for a firm. The board plays a critical role of managing any

firm through regular meetings. Board meetings and the frequency thereof is a critical component of corporate governance as it impacts on the strategy setting and charting of the direction of bank performance.

Through the board meetings, the directors discuss with the aim of addressing the relevant matters affecting the firm. To achieve this objective, the directors need to be persons who are highly knowledgeable and experienced in their respective fields.

The experience is applied to the current issues afflicting the firm while at the same time focussing on the going concern objective. The higher the frequency of meetings, the stronger the unity of purpose for the board of directors. Specifically, the decisions resulting from the outcomes of the board meetings are key in determining the performance of the firm.

Table 4.7: Board Structure and Composition

Board structure and composition	SD(%)	D(%)	N(%)	A(%)	SA(%)	Mean	Std. Deviation
Board size of the bank is less than 9	16.7	16.7	0	25.0	41.70	3.5833	1.62135
There is clear description of the roles of the board of directors	0	0	0	66.7	33.30	4.3333	.49237
The chairman and the CEO are different individuals	0	0	0	58.3	41.70	4.4167	.51493
There are independent directors on the board of directors	0	0	8.3	66.7	25.00	4.1667	.57735
The board of directors also constitute directors representing minority interests	0	0	16.7	75.0	8.30	3.9167	.51493
Meetings of board of directors are called as scheduled	0	16.7	8.3	58.3	16.70	4.1667	.57735

4.6 Transparency and Disclosure

The study sought to establish whether commercial banks in Kenya espouse transparency and disclose important information related to their operational strategies. The focus, on transparency and disclosure as part of the core values of organizations shirks the possibility of malpractice that affect the integrity and level of efficiency of operations of the bank.

Being highly controlled and regulated institutions, banks must demonstrate their ability to be the custodians of the funds from the surplus income units in the economy and also provide a mechanism for the deficit economic units through the intermediation approach, an opportunity to access the funds for investment.

As part of disclosure, the study focused on; remuneration to board of directors, ownership and shareholding, online publication of corporate information and appointment of auditors & audit fees are analyzed. Table 4.8 presents the disclosure and transparency analysis of the respondents.

4.6.1 Disclosure of remuneration

The study sought to determine whether commercial banks in Kenya provide full disclosure in their financial statements of the remuneration to the board of directors separate from other employee costs. On disclosure of remuneration to the board of directors, the findings indicate that 58.3% and 25% agreed and strongly agreed respectively, that there is disclosure of employee costs as well as directors' remuneration the financial statements. However, despite this finding, 16.7% were indifferent with a convergence of 4.08 and standard deviation of 0.668. This finding indicates that banks in Kenya, provide information relating employee costs and directors' remuneration in the financial statements. This practice helps to improve the degree of transparency of the bank by availing information to investors to enable informed decisions.

4.6.2 Ownership and shareholding

The research examined the whether commercial banks disclosed their ownership and shareholding structure in the annual reports. From literature, board ownership is a means of reducing agency problems. Board ownership and shareholding provides the managers with an incentive to pursue investment strategies that increase firm value.

The disclosure of the information in the financial reports, lends confidence to both the existing and the potential shareholders. The results indicate that 75% of the respondents agreed that there is disclosure of ownership and shareholding in their banks since the annual reports were always prepared. Similarly, 25% of the respondents agreed with this view, with a mean of 4.25 and a standard deviation of 0.45. The results of this study are an indication of adequacy in disclosure of the shareholding of the bank in the financial statements. The findings are therefore consistent with Horner (2010) who found a positive and significant relationship between the board of directors' ownership in a firm and performance. leads to support on the managerial entrenchment to arrive at the best performance.

4.6.3 Online Publication of annual reports and accounts online

According to the International Accounting Standards Board (IASB) “the objective of financial reporting is to provide financial information about the reporting entity that is useful to present and potential equity investors, lenders and other creditors in making decisions in their capacity as capital providers” (IASB 2008). Today, the internet is one of the most powerful tool of communication. It can reach significantly large populations at very minimal cost, and encourages investment (Aly *et al.*, 2010). Therefore, due to the technological advancements and the fact that technology has facilitated significant reduction in operational costs, the study sought to find out whether commercial banks leverage on the use of technology in their operations particularly for publication of their annual reports and financial statements. The findings indicate that 83.3% of the respondents agreed that the annual reports and accounts of the bank were published online while 16.7% strongly agreed. This finding implies that banks in Kenya facilitate access to their financial performance

information for public scrutiny on all operational aspects of the firm through the use of the internet.

The findings are consistent with Bekiaris et al. (2013), who found that, among others, Internet-related financial disclosure is significantly associated with profitability, leverage, firm age and ownership dispersion. This results reinforce the significance of effective corporate disclosure to enhance the mutually beneficial relationship between shareholders and managers.

Corporate financial information disclosure is key in facilitating informed decisions by the users of the said information. The information is important for estimation of the value of the firm and access to other details that enhance competitiveness.

4.6.4 Appointment of Auditors on rotation and Audit fees

The study sought to determine the effect of appointment of auditors on rotation and disclosure of auditors' fees in the financial statements. Appointment of external auditors aims at providing quality assurance on the financial statements of the firm. Rotation of auditors can either be mandatory or voluntary. Mandatory rotation occurs when firms are required to change their auditors after a fixed period of time. The duration may however vary depending on regulatory requirements (Lu, 2005). On the other hand, voluntary rotation is the discretionary changing of auditors by the firm (Davidson et al., 2005). The rotation can either be audit firm rotation or audit partner rotation. This assurance can only be guaranteed when certain minimum standards are met. Yet, if the bar on the required standards is set too high, the quality of the audit could be compromised. As Dye (2011), contends, strict and tighter auditing standards could diminish audit quality due to liability aversion. They argued that, strict audit standards are difficult to comply with and therefore could compromise the audit quality.

Similarly, Sunder (2014), found that tighter auditing standards impede the auditors' application of expert decision on the audit process. The findings indicate that 66.7% of the respondents agreed that appointment of auditors on rotation occurs, and also concurred that payments of audit fees is disclosed in the financial statements. This

result is consistent with the view held by the proponents of auditor rotation. According to Lu, (2005), mandatory rotation curtails the opportunity of opinion shopping by the auditors leading to better audit quality and financial management advice. This advice is important for facilitating improved organizational performance.

Similarly, Davis et al., (2009), provide that rotation enables different perspectives and insights into the financial statements. They argued that working for the same client for many years impairs professional judgement by the auditor due to the familiarity problem. Other proponents of rotation opine that it helps in increasing the competition in the audit market by encouraging 'small' firms to compete against the 'Big Firms'.

In the event of an audit failure, both the client and the auditor could suffer significant losses. Therefore, where there is rotation, the cost thereof could significantly be less than the cost of litigation and loss of reputation of the auditor from an audit failure (Jackson et al., (2008). However, 16.7% were in a dilemma with a mean of 4.0 and a standard deviation of 0.6. This indicates that some banks did not rotate their auditors or disclose the audit fees payments which is against good corporate governance practice. From this finding, it can be argued that rotation of auditors has no consequence. This can be buttressed by the fact that due to the fear of potential litigations, the auditor shall endeavor to protect their reputation. Similarly, cost of auditor rotation maybe unaffordable to both the auditor and the client hence making it undesirable.

Kim et al. (2007), and Lu (2005), indicate that a fixed auditor tenure increases the auditor lack of independence and objectivity, leading to sloppiness in their audit assignment. Non rotation of auditors also creates an avenue where the client is viewed by the auditor as a source of cash flow into perpetuity. This leads to development of the dependency syndrome hence compromise the objectivity of the auditor and the resultant financial statements.

Table 4.8: Transparency and Disclosure Descriptive Statistics

Transparency and disclosure	SD(%)	D(%)	N(%)	A(%)	SA(%)	Mean	Std. Deviation
There is full disclosure of remuneration to the board of directors and staff	0	0	16.7	58.3	25.00	4.0833	.66856
The annual report of ownership and shareholding is prepared	0	0	0	75.0	25.00	4.2500	.45227
Information on employee ownership is stated	0	0	25	50.0	25.00	3.7500	1.13818
There is rotation of the appointment of the auditors	0	0	8.3	66.7	25.00	4.1667	.57735
The annual reports and accounts are available online	0	0	0	83.3	16.70	4.2500	.45227
Payments to auditors for consultancy services is disclosed	0	0	16.7	66.7	16.70	4.0000	.60302

4.7 Descriptive Statistics on Corporate Governance Structural Efficiency

The research used regression analysis to determine the statistical relationship between corporate governance structural efficiency and bank performance. The null hypothesis was tested using the regression model. The null hypothesis tested is stated as below:

H_{02}: Corporate Governance Structure efficiency has no significant effect on financial performance of commercial banks in Kenya.

The linear regression model showed $R^2 = 0.45.4$. This means that a 45.4% change in financial performance of commercial banks in Kenya can be explained by a unit change of corporate governance structural efficiency, while the remaining 54.6% can be attributed to other factors. The result is shown in Table 4.9. This implies that corporate governance is an important predictor of performance of commercial banks in Kenya. As corporate governance relates to the process by which organizations are directed and controlled, implies that, successful banking institutions must espouse good corporate governance practices and structures.

Efficiency in corporate governance provides a mechanism for accountability by managers to the shareholders. It also mitigates the agency problems in the firm. Through corporate governance, managers are expected to demonstrate authority,

accountability, stewardship, leadership, direction and control as delegated to them by the shareholders.

Table 4.9: Model Summary of corporate governance structure efficiency

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.674[a]	.454	.452	3.27753

The ANOVA of the results show that the model used is statistically significant. This is shown by the F-statistic of 212.851 with p value, p = 0.000, less than 0.05 as indicated in Table 4.9. This implies that there is a positive and significant relationship between corporate governance structural efficiency and financial performance of commercial banks in Kenya, indicating that corporate governance structural efficiency is a good predictor of bank performance.

Table 4.10: Analysis of variance (ANOVA) Corporate Governance Structural Efficiency

Model		Sum Squares	ofDf	Mean Square	F	Sig.
1	Regression	2286.491	1	2286.491	212.851	.000[b]
	Residual	2750.005	256	10.742		
	Total	5036.496	257			

The regression coefficient of the resulting model is presented in Table 4.10. The results show a coefficient of 0.986 and a constant, β = -3.473. This implies that, a unit change in corporate governance structural efficiency leads to an increase in bank performance by 0.986.

On the contrary, a nil increase, leads to a decrease in performance of commercial banks in Kenya by 3.473. The result is supported by the t value of 14.589 and p value of 0.000. The null hypothesis is therefore rejected.

Table 4.11: Coefficients of corporate governance structure efficiency

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-3.473	1.678		-2.070	.039
	Corporate governance structure efficiency	.986	.068	.674	14.589	.000

4.8 Financial Services Efficiency on Financial performance

Banking institutions, in the execution of their intermediation function, perform this role through provision of key services to their clients. The efficiency with which this services are offered is critical in shaping the performance of the institution. Table 4.12, presents and indicates the services offered by banks that significantly contribute to its financial performance.

4.8.1 Access to Customer Transaction Management Systems

The study sought to determine how efficient access to customer transaction information by the bank complements the efficiency of its service delivery. Needless to say, the modern customer requires to spend very little time in the banking hall. The emergence and advancement of technology has further provided a platform for remote access to banking services, hence the need for efficient service delivery. Therefore, the efficiency with which the customer transaction management system delivers this outcome is key in driving bank performance. This phenomenon helps to drive up transaction volumes which impact on the profitability of the bank. The results indicate that 23% of the respondents strongly agreed and 32% agreed that, an efficient customer transaction management system increases transaction volume of the bank and hence boost its profitability. Despite this outcome, 7.8% strongly disagreed, 23% disagreed while 15% were in a dilemma, with a mean of 3.4 and a standard deviation of 1.3.

This indicates the existence of information asymmetry, a condition that could negatively affect the financial performance of the bank. Therefore, there is need to

invest more in efficient and effective customer transaction management systems, to improve customer satisfaction in service delivery and overall performance of the bank.

4.8.2 Reliability and dependability of payment systems

The payment system reliability and dependability is paramount in cementing customer confidence. A reliable payment system therefore ensures that customer transactions are performed on a regular basis, thus improving the income streams of the bank. A reliable and dependable service guarantees and insures confidence by the customer on the product and service offerings on the market. It reduces the customers' appetite to seek for alternative service offerings available in the market. Iftekhar et al., (2009), indicate that banks perform better with more developed and efficient retail payment services.

Similarly, it boosts customer loyalty, thus creating and annuity form of income stream for the firm due to the fixed annual account charges levied on customer accounts by the bank. Therefore, the reliability and dependability of the banks' payment platform is critical to its profitability and performance. The customers will always use its without fear of losing their funds. The results of this study indicate that 26% of the respondents strongly agreed and 33% agreed that a reliable and dependable payments system contributes to improved bank performance and profitability. On the contrary, 32% disagreed while 9.7% were indifferent. This result indicates that the payment system adopted by the bank should guarantee safety of the customer transactions and be free form breaches.

4.8.3 Customer convenience

For customer convenience to achieved, there is need to have banking services located at places that can be accessed with ease. The study sought to determine whether the wide coverage of Automated Teller Machines (ATMs), Points of Sale systems (POS) and easy access to Debit and Credit cards increases bank revenues and profitability. The results showed that 25% of the respondents strongly agreed that the ease of access to these services increases bank performance while 56% were in agreement

with this view. A wider geographical coverage of these services increases the degree of customer experience. Further, it cements and enhances efficiency of service delivery. As such, this services offer an important revenue stream to the bank hence significantly contributing to its financial performance.

4.8.4 Effect of ICT on Bank Efficiency

Technology is a critical component in improving efficiency of banking operations. With the rapidly changing customer dynamics, technology has offered a platform where banks can be able to meet customer expectations with ease. The Technology Acceptance Model (TAM), advanced by Davis (1989), suggests that an individuals' behaviour and intention determine the use of Technology in their operations. The banking sector in Kenya has invested heavily in new and emerging technologies such as internet banking, mobile banking, point of sale (POS), debit and credit cards among others. These ICT innovations are aimed at turning around the performance of the banking sector in Kenya, whose appetite for profitability is unquenchable. Ngumi (2013), found that bank innovations had a positive and significant effect on financial performance of commercial banks in Kenya.

According to Akram and Allam (2010), the use of information technology, such as the adoption of ATMs, improved the financial and operational performance of a firm due to the efficiency and convenience it provides. However, the fast rate at which technology is changing poses a great challenge to the banking institutions which must always ensure that their technologies are up-to-date. In this regard, 28% of the respondents strongly agree that poor and obsolete technology diminishes bank performance while 49% agree and 23% are indifferent. It therefore, follows that technology is significantly important in efficiency improvement for banks as it provides convenience for the customers to access services from remote locations.

Leveraging on this, banks charge a small fee which has significantly boosted their profitability. Mobile phone transactions and online banking have seen significant uptake and hence an important income stream for the banks. Although this is the case, 33% of the respondents disagree that this mode of transacting banking operations has not improved the level of transparency and efficiency in the banking

sector. There is however general agreement to the contrary. Fraud and breaches in the payment system dents the confidence of the customers and negatively affects the banks' financial performance as indicated by 42% of the respondents who strongly agree with this argument and 58% who agree with it.

As banks move towards reducing the number of customers visiting and/or being served at the banking halls, a large number of banking transactions are now being processed through alternative means. Banks have adopted agency banking and have encouraged most transactions to be done through debit and credit cards greatly improving the efficiency of operations and at the same time generating more revenues for the bank. Table 4.12 summarises the responses on the effect of financial services efficiency on financial performance of banks in Kenya.

Table 4.12: Financial Services Efficiency

Financial Services Efficiency	SD(%)	D(%)	N(%)	A(%)	SA(%)	Mean	Std. Deviation
Quick and simplified access to customer transactions management system increases transaction volume and profitability	7.8	22.5	15.1	31.8	22.90	3.3953	1.27177
Reliable and dependable payments system contributes to improved bank performance and profitability	0	31.8	9.7	32.6	26.00	3.5271	1.18734
A wide coverage of payment systems such as ATMs, POS, Debit & Credit cards increases bank revenue sources and performance	0	1.6	17.4	56.2	24.80	4.0426	.69610
Poor and obsolete technology contribute to inefficiency of payment system and depressed profitability	0	0	22.9	49.2	27.90	4.0504	.71216
Fraud and breaches in the electronic payments system diminishes performance and profitability	0	0	0	58.3	41.70	4.4167	.50361
Adoption of e-banking has increased competition and profitability of the banking sector	8.3	25	16.7	33.3	16.70	3.2500	1.25974
Adoption of financial innovations such as online and mobile phone banking has increased transparency and efficiency of banking	0	33.3	8.3	33.3	25.00	3.5000	1.21584
Issuance of a large number of debit & credit cards contributes to better profitability	0	0	16.7	58.3	25.00	4.0833	.65386
Processing of large number of transactions through debit & credit cards indicates greater efficiency and bank performance	0	0	41.7	38	20.80	4.0000	.72232

4.8.4 Financial Services Efficiency Descriptive and Regression Analysis Statistics

The study used regression analysis to determine the linear statistical relationship between financial services efficiency and bank performance.

The null hypothesis as stated in chapter one were tested using the regression model to determine the effect of financial services efficiency on the performance of commercial banks in Kenya. The null hypothesis tested is stated as below:

H_{03}: Financial services efficiency has no significant effect on financial performance of commercial banks in Kenya.

The linear regression model shows R^2= 0.468 which means, 46.8% of the change in the financial performance of commercial banks in Kenya can be explained by a unit change of Financial services efficiency. The result is shown in Table 4.13. This indicates that a unit change in financial services efficiency translates to a 46.8% change in financial performance of commercial banks in Kenya. The remaining 53.2% can be explained by other factors.

The null hypothesis is therefore rejected. The findings provide a solid argument as to the need to enhance the financial services efficiency. As such, the results reinforce the importance of financial services efficiency in driving the performance of banks in Kenya. Banks need to reengineer how they offer their products and services. The current customer is dynamic with constantly changing tastes and preferences. Due to globalization, customers have a wide variety of service offerings to choose from. Therefore, bank managers must strive to be creative and innovative to remain competitive.

Table 4.13: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.684[a]	.468	.466	3.23605

The ANOVA results shows that the model was statistically fit. The results indicate that financial services efficiency is a good predictor of performance of commercial banks in Kenya. The findings are supported by the F-statistic of 224.947 with a p value, p=0.000, which is less than 0.05. Table 4.14 provides a summary of the ANOVA results.

Table 4.14: Analysis of Variance (ANOVA)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2355.655	1	2355.655	224.947	.000
	Residual	2680.841	256	10.472		
	Total	5036.496	257			

The regression coefficients of the resulting model are shown in Table 4.15. The constant, $\beta = 7.533$ and the coefficient $\beta_0 = 0.947$ are obtained. The values indicate that a unit increase in financial services efficiency would lead to a corresponding increase in performance by 0.947. This finding is supported by the p value of 0.000. Depending on the level of financial services efficiency of the bank, a zero change would result in a 7.533 increase in performance. This phenomenon can be observed in a situation where the bank has achieved the optimal input-output balance, the Technical efficiency being equal to one. At this level, the banks are able reengineer their financial services and products value chains in line with market conditions and therefore sustain improved performance. The findings are consistent with Miencha et al. (2016), who posit that banks need to adopt latest technology, be innovative in their product and services and create awareness to attract more customers so as to be profitable. The null hypothesis is therefore rejected.

Table 4.15: Coefficients of financial services efficiency

Model		Unstandardized Coefficients		Standardizedt Coefficients		Sig.
		B	Std. Error	Beta		
1	(Constant)	7.533	.909		8.286	.000
	Financial services efficiency	.947	.063	.684	14.998	.000

4.9 Financial Information Efficiency on Financial Performance

The cost of information is inherent in the efficiency with which such information is availed to aid in the decision making process. Table 4.16 presents the results of the key findings as described in the following sections.

4.9.1 Transaction costs

The study sought to determine whether the costs, fees and other charges levied by the banks are competitive. The results indicate 31.4% that 64% of the respondents agreed and strongly agreed respectively, that their bank had lower transaction costs. Transaction costs is the key motivator for customers. It is the basis of customer attraction, retention and improved performance. This finding indicates that the banking sector in Kenya competes largely on lowering of transaction costs of doing business.

4.9.2 Default risk

The results show that, 55% of the respondents strongly agreed that lower transaction costs led to a reduction in default rate by borrowers. Reduced default risk is an indication of efficiency and improved financial performance since the none performing loan balance declines significantly. The portfolio at risk (PAR) for the bank also reduces and therefore, the banks books will show a true and fair view. The loan loss provision by the banks also reduces and the bank can therefore reinvest its earnings in more productive investments thus leading to improved asset quality.

Further, 56% of the respondents strongly agreed that reduced transaction costs boosts sales revenues thus ensuring that the bank earns more profit from the alternative income streams through interest and non-interest income.

4.9.3 Accuracy, Reliability and Understandability of information provision

Accuracy, reliability, understandability and comparability of accounting information, are important qualitative characteristics that information disclosed in the financial statements should possess. Accordingly, 81% of the respondents strongly agreed that their banks provided clear and understandable information. Similarly, 37% stated that their bank provides timely and accurate information and 28% stated that the information was reliable and comparable. Interestingly, 15% and 14% of the respondents disagreed in terms of information quality, implying that some banks do not adhere to and comply with the provisions of the International Accounting

Standards (IAS) on provision of quality accounting information. There was however a 23% and 22% level of indifference as to whether the information provided was understandable and reliable. From this perspectives, it can be observed that information provision by the banking sector in Kenya is generally good. That quality of such accounting information is unquestionable. This information is important in aiding good investment decision making for bank managers and investors alike.

Banks therefore need to reestablish and enhance the information provision mechanism and ensure strict compliance to the international standards. Finally, customer information sharing with Credit Reference Bureaus (CRB) has improved compliance and efficiency of collection of receivables which has improved the financial performance of the banks. This is indicated by 57% of the respondents who strongly agreed that this aspect has greatly transformed banking operations. Similarly, the operating costs of the bank also affect the input prices of the bank such as personnel costs as indicated by 43% of the respondents who strongly agreed with this view.

Table 4.16: Financial Information Efficiency

Financial Information Efficiency	SD(%)	D(%)	N(%)	A(%)	SA(%)	Mean	Std. Deviation
Our bank charges lower transaction costs for its products and services comparatively	0	3.9	0.8	31.4	64.00	4.5543	.70501
Lower transaction costs has reduced default rate by borrowers	0	1.6	3.9	39.5	55.00	4.4806	.64946
Lower interest charges has led to reduced loan loss provision and improved asset quality	0	2.3	2.3	48.8	46.50	4.3953	.65326
Reduced transaction costs has contributed to increased sales revenue from increased interest and non-interest income	0	8	8.5	34.9	55.80	4.4574	.68341
The bank provides information that is clear and understandable to investors at lower cost	0	0	0	18.2	81.80	4.8178	.38674
The information provided by the bank is timely and accurate for fundamental security analysis	0	15.1	22.5	25.6	36.80	3.8411	1.08489
Overall, our bank provides information that is reliable and comparable in the market	0	14.7	22.1	34.5	27.70	3.7713	1.02405
Financial information sharing has improved the efficiency and our bank's financial performance	0	0	0	42.6	57.40	4.5736	.49551
Operational costs of my bank affect the price of inputs such as personnel costs.	0	0	8	56	43.40	4.4264	.51097

4.10 Financial Information Efficiency Regression Analysis Statistics

Regression analysis was used to determine the linear statistical relationship between financial information Efficiency and bank performance.

The null hypothesis as stated in chapter one were tested using the regression model to determine the effect of financial services efficiency on the performance of commercial banks in Kenya. The null hypothesis tested is stated as below:

H_{04}: Financial Information Efficiency has no significant effect on financial performance of commercial banks in Kenya.

The regression model showed R^2= 0.656. This means that 65.6% of the change in financial performance of commercial banks in Kenya can be explained by a unit change of Financial information efficiency, while 34.4% can be attributed to other

factors. This is shown in Table 4.17. The results indicate that; a one unit change in financial information efficiency translates to 65.6% change in financial performance of commercial banks in Kenya. The null hypothesis is therefore rejected. The findings provide a solid argument as to the need to enhance the financial information efficiency in the banking sector. As such, the results reinforce the importance of financial information efficiency in driving the performance of banks in Kenya. Banks need to enhance information provision to aid in informed decisions of its users. Globalization has brought about the need for transparency and full disclosure of information. Banks can leverage on the use of technology and embrace internet reporting to ensure availability of information. Therefore, bank managers must strive to be creative and innovative so as to enhance the efficiency of information provision.

Table 4.17: Model Summary-Financial Information Efficiency

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.810[a]	.656	.654	2.60262

The ANOVA results show that the F-statistic is 487.545. This indicates that financial information efficiency is a strong predictor of performance. This results are supported by the p value of 0.000 which is less than 0.05. This confirms that, financial information efficiency is a significant predictor of financial performance of commercial banks in Kenya. The result is indicated in Table 4.18. This implies that, there is a positive and significant relationship between financial information efficiency and financial performance of commercial banks in Kenya.

Table 4.18: ANOVA of financial information efficiency

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3302.448	1	3302.448	487.545	.000[b]
	Residual	1734.048	256	6.774		
	Total	5036.496	257			

The regression coefficients of the resulting model are shown in Table 4.19. The constant, β = -1.757and the coefficient β_0 = 1.015 are obtained. The values indicate that a unit increase in financial information efficiency would lead to a corresponding increase in performance by 1.015. This finding is supported by the p value of 0.000. Depending on the level of financial information efficiency of the bank, a zero change would result in a -1.757 decrease in performance. This phenomenon can be observed in a situation where the bank has achieved the optimal input-output balance, where the Technical efficiency being equal to one. At this level, the banks are able reengineer their financial services and product value chains in line with market conditions and therefore sustain improved performance. The findings are consistent with Miencha et al. (2016) who posit that banks need to adopt latest technology, be innovative in their product and services and create awareness to attract more customers so as to be profitable. The null hypothesis is therefore rejected.

Table 4.19: Coefficients of financial information efficiency

Model		**Unstandardized Coefficients**		**Standardizedt Coefficients**		**Sig.**
		B	Std. Error	Beta		
1	(Constant)	-1.757	1.036		-1.697	.091
	Financial Information efficiency	1.015	.046	.810	22.080	.000

4.11 Financial Performance Descriptive Statistics

The financial performance of the banks was measured using the return on assets (ROA) and return on equity (ROE) as the dependent variables. The descriptive statistics are indicated in Table 4.20. The skewness and kurtosis were measured to determine their normality and appropriateness to the study.

Table 4.20: Descriptive Statistics for the Dependent Variable

		ROA	ROE
N	Valid	12	12
	Missing	0	0
Mean		3.0692	20.4858
Std. Deviation		.31713	2.39478
Skewness		.153	.349
Std. Error of Skewness		.637	.637
Kurtosis		-1.375	-.480
Std. Error of Kurtosis		1.232	1.232
Minimum		2.64	16.62
Maximum		3.52	24.40

4.11.1 Normality Tests for the variables

The normality of data distribution was analyzed by investigating the skewness and kurtosis. Where a variable presented an absolute skewness index value greater than 3.0, we conclude that the variable is extremely skewed. Similarly, where the variable returned a Kurtosis index greater than 8.0, the conclusion was that the variable was extremely kurtosis (Kline, 2005).

Cunningham, (2008), defined the acceptable range of the skewness and kurtosis index values. He argued that absolute index values smaller than 2.0 for Skewness and 7.0 for Kurtosis, result in the least violation of the assumption of normality. From the normality test results of the dependent variable in Table 4.20, the skewness and Kurtosis values are in the range of -1 and +1. This therefore implied that the normality assumption under the criteria, was fulfilled. Similarly, on the test for normality on the independent variables, Table 4.21 indicates the range of -1 and +1 for skewness and kurtosis values, satisfying the assumption of normality. From this analysis, the criteria as prescribed by Cunningham (2008) and Kline (2005) is therefore satisfied and the variables were therefore adopted for this study.

Table 4.21: Independent Variables

Variables	N	Std. Deviation	Skewness	Std. Error	Kurtosis	Std. Error
Financial Information Efficiency	258	3.75774	-.026	.152	-1.371	.302
Financial Services Efficiency	258	3.67099	.176	.152	-1.285	.302
Financial Management Efficiency	258	2.79410	-.002	.152	-1.232	.302
Governance Structural Efficiency	258	7.22596	.710	.152	.029	.302
Financial Performance	258	2.42121	-.745	.152	-.065	.302

Figure 4.1 shows the Histogram of the dependent variable. The frequencies are plotted on the vertical axis while the standardized residuals are plotted on the horizontal axis. The data is normally distributed with a standard deviation of 0.990.

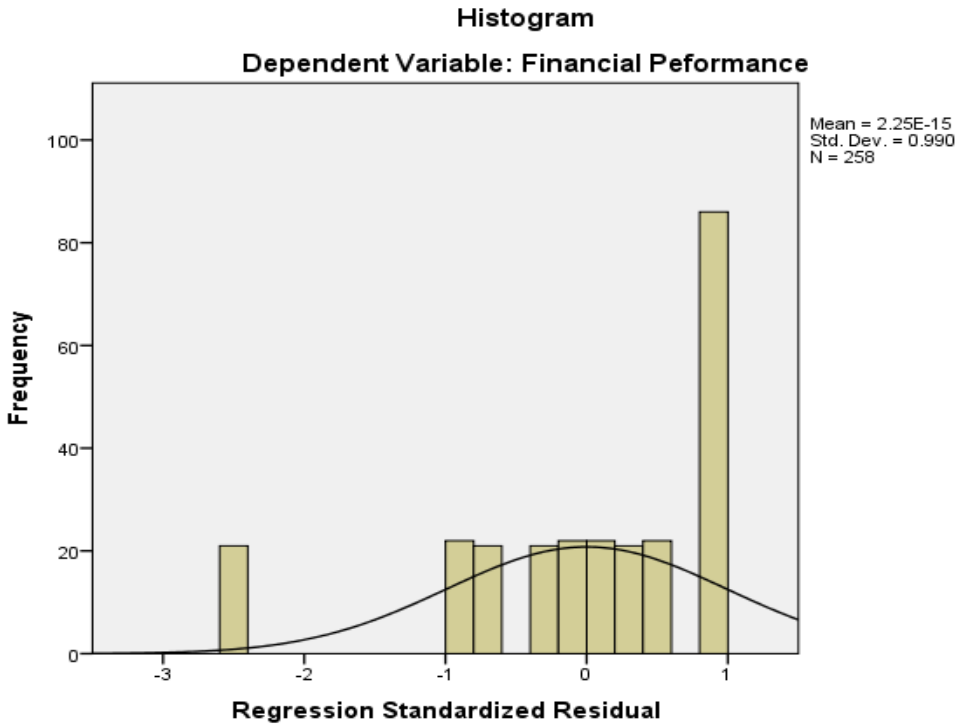

Figure 4.1: Histogram of the Dependent Variable

Similarly, Figure 4.2 shows the Normal P-P plot for the regression residuals of the dependent variable. The expected cumulative probabilities are plotted on the vertical axis while the observed cumulative probabilities are plotted on the horizontal axis. From the results, the data fits well to the normal distribution.

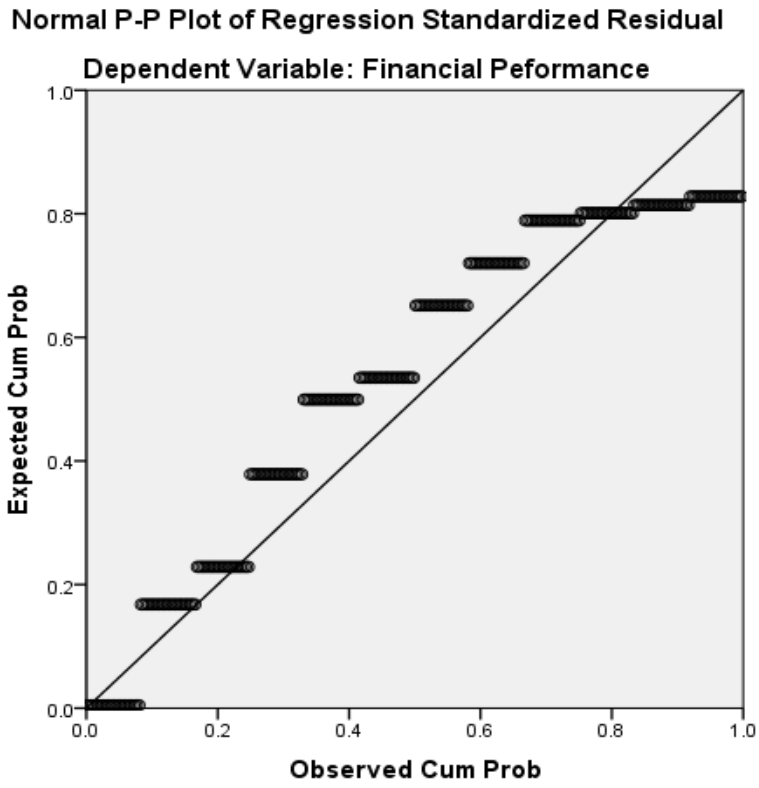

Figure 4.2: The Normal P-P Plot of Regression Standardized Residuals

4.11.2 Test for Collinearity and Multi-collinearity

Multi-collinearity is a situation that exists if the correlations between the independent variables themselves is significantly strong. This situation makes it extremely difficult to identify and isolate with precision, the effect of each individual independent variable on the dependent variable. Multi-collinearity is therefore an undesirable situation that needs to be identified and fixed, as it misleadingly inflates the standard error values, making some variables statistically inconsequential while they ought to actually be significant. (Martz, 2013). Multi-collinearity, is a condition that depicts the explanatory variables to be linear dependent. According to

Studenmund, (2011), absolute tolerance values greater than 0.8 indicate the existence of multi-collinearity. The tolerance values for the independent variable was calculated from the model 1 - R^2. The reciprocal of the tolerance value was then obtained to give the VIF. Table 4.22 indicate the multi-collinearity statistics.

Table 4.22: Test for Collinearity and Multi-Collinearity

Model		Collinearity Statistics	
		Tolerance	**VIF**
1	(Constant)		
	Financial management Efficiency	.614	1.629
	Corporate Governance Structural Efficiency	.688	1.454
	Financial Services Efficiency	.466	2.146
	Financial Information Efficiency	.413	2.423

The VIF values were less than 5, implying no presence of multi-collinearity. The VIF shows how much the variance of the coefficient estimate is being inflated by multi-collinearity. Similarly, a tolerance value close to 1, means there is little multi-collinearity, whereas a value close to 0, suggests that multi-collinearity may be a threat (Belsley, Kuh & Welsch, 2004). The reciprocal of the tolerance is known as Variance Inflation Factor (VIF). Equally, the VIF measures multi-collinearity in the model in such a way that, if no two independent variables are correlated, then all the VIF values will be 1, implying that there is no multi-collinearity among the variables.

But if the VIF value for one of the variables is around or greater than 5, then there is multi-collinearity associated with that variable (Martz, 2013). From the findings therefore, it is showed that there was no presence of multi-collinearity among the independent variables. All the values had a tolerance of less than 1 and the VIF was less than 5. Therefore, following Studenmund (2011) and Martz, (2013) criteria, multi-collinearity is not a concern.

4.11.3 Heteroscedasticity

Regression models operate under certain assumptions whose violation renders the results obtained misleading. Heteroscedasticity occurs when the variance of the error terms varies across the observations (Ervin and Long, 2000). The Breusch-Pagan and

Koenker test, is usually used to determine and check the null hypothesis, that the variances of the error terms were all equal versus the alternative hypothesis that the variances of the error terms were a multiplicative function of one or more independent variables. The test, therefore was used to evaluate the null hypothesis that heteroscedasticity is not present, implying that all the variables are homoscedastic. In this respect, if the significance value is not greater than 0.05, the null hypothesis is rejected. Similarly, a large Chi-square value, greater than 9.22, would indicate the presence of heteroscedasticity (Sazali et al., 2009). From the results in Table 4.23, the Chi-square value obtained is 1.451, indicating that heteroscedasticity was not a problem. The null hypothesis was therefore rejected.

Table 4.23: The Breusch-Pagan Test for Heteroscedasticity

Ho	Variables	Chi^2	Prob > Chi^2
Constant Variance	FME,CGSE,FSE, FIE	1.451	0.835

Variables: Financial management efficiency (FME), corporate governance structure efficiency (CGSE), Financial services efficiency (FSE) and Financial information efficiency (FIE)

4.12.4 Correlation Analysis

Table 4.24, provides the correlation matrix for the variables under investigation. The Pearson correlation coefficient was used to determine whether any two of the variables were correlated, and to establish the degree of correlation. Kombo and Tromp (2009), explain that the correlation coefficient represents the linear relationship between two variables.

The findings reveal that financial performance, proxied by ROA and ROE had a strong and positive correlation with the independent variables, implying that a unit increase in any of the independent variables, would result in realization of positive performance for the banks. The correlation index was measured at a significance level of 0.01. A correlation above 0.8 between independent variables indicates the existence of the problem of multi-collinearity among the variables (Gujarati and Sangeetha 2008). From Table 4.24 below, all the variables produced a correlation

coefficient less than 0.8, except for financial performance and financial information efficiency. The plausible explanation for this, is that financial information efficiency constructs were based on the cost of product offering by the banks, measured by interest rate spreads, ledger fees and other transaction charges. This costs also constitute a significant measure of profitability, leading to general financial performance. This therefore could explain the relatively strong correlation between the two variables. To cure this problem, efficiency scores were computed using the Data Envelopment Analysis (DEA) approach on secondary data obtained from the annual financial statements and reports.

Table 4.24: Pearson's Correlation Statistics on Performance and Bank Efficiency

Variable		Financial management Efficiency	Corporate governance structural efficiency	Financial services efficiency	Financial Information efficiency	Financial performance
Financial management Efficiency	Correlation	1				
Corporate governance structural efficiency	Correlation	.323**	1			
Financial services efficiency	Correlation	.428**	.548**	1		
Financial Information efficiency	Correlation	.618**	.433**	.673**	1	
Financial performance	Correlation	.680**	.674**	.684**	.810**	1

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

4.13 The Overall regression model

The overall regression analysis is shown in Table 4.25. The result indicates a strong and positive relationship between financial efficiency and performance of commercial banks in Kenya as specified by the correlation coefficient, R = 0.91. The coefficient of determination, R^2= 0.825 provides that, 82.5% of the change in performance of commercial banks in Kenya can be explained by a unit change in financial efficiency. The remaining 17.5% of the variation can be attributed to other factors.

Table 4.25: Model fitness Summary - Overall regression model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.910[a]	.828	.825	1.84969

The results of the ANOVA are indicated in Table 4.26. The F-statistic of 304.768 shows that the independent variables are significant predictors of the dependent variable. This finding is supported by p value of 0.000, which is less than the conventional 0.05. This implies that, there is a positive significant relationship between efficiency and financial performance of commercial banks in Kenya.

Table 4.26: The overall Analysis of variance and Coefficients of regression model

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4170.890	4	1042.723	304.768	.000[b]
	Residual	865.606	253	3.421		
	Total	5036.496	257			

Table 4.27 presents the coefficients for each independent variable, to show its individual effect on the financial performance of the bank.

The Beta coefficient shows the changes in bank performance for a unit change in the predictor variable. Where the Beta coefficient is positive, it implies that a unit change in the predictor variable would lead to an increase in bank performance. The converse is true for a negative Beta value. The results in Table 4.27 indicate all positive Beta coefficients.

For example, a unit change in financial management efficiency would lead to an increase in bank performance by 0.200 (p = 0.000). Similarly, a unit increase in corporate governance structural efficiency would lead to an increase in bank performance by 0.519 (p = 0.000). The results are also true for Financial services efficiency with a beta coefficient of 0.113 (p = 0.033) and Financial Information Efficiency with a beta coefficient of 0.554 (p = 0.000).

This implies that a unit change in any of the independent variables would result in an increase in bank performance. These findings are supported by the low levels of significance as indicated by the p values. The p value is used to test the null hypothesis and the significance of the predictor variables of the study. As the p values of 0.000 are less than the conventional 0.05, for the independent variables, it implies that the predictor variables are significant in determining the performance of commercial banks listed on the Nairobi Securities Exchange.

From this finding, the null hypotheses; H_{01}, H_{02}, H_{03} and H_{04} are rejected. Consequently, the findings lead to the conclusion that, there is a strong and significant relationship between financial intermediation efficiency and performance of commercial banks in Kenya.

Table 4.27: The Overall Regression Model Coefficients

Model		Unstandardized Coefficients		Standardizedt Coefficients		Sig.
		B	Std. Error	Beta		
1	(Constant)	-12.291	1.064		-11.552	.000
	Financial management Efficiency	.200	.026	.258	7.746	.000
	Corporate governance structural efficiency	.519	.046	.355	11.285	.000
	Financial services efficiency	.113	.053	.082	2.139	.033
	Financial Information efficiency	.554	.051	.442	10.897	.000

4.14 Regression Analysis Descriptive statistics for Secondary Data

This section relates to objective five which involved evaluating the determinants of efficiency. Specifically, the section sought to evaluate the relationship between Technical and Scale efficiency and performance of commercial banks.

4.14.1 The effect of Technical and Scale Efficiency on Bank Performance

To evaluate the effect of Technical and Scale Efficiency on financial performance, a two-stage approach was used. First, the efficiency scores were computed using the non-parametric, Data Envelopment Analysis (DEA) approach. Secondly, Tobit regression analysis was carried out against bank performance proxied by ROA and ROE as the dependent variables. The following regression model is specified.

$$Y_{it} = \alpha_0 + \alpha_1 TEit + \alpha_2 SE_{it} + \varepsilon_{it}$$

Where Y_{it} = Financial Performance of Bank *i* at time *t*, using, ROA and ROE as proxies, α_0 = Intercept, $\alpha_1 - \alpha_2$ = Parameters or coefficients, TE_{it} = Technical efficiency of bank *i* at time *t*, SE_{it} =Scale efficiency of bank i at time t, ε_{it} = Error term of bank *i* at time *t.*

From Table 4.28, it is found that Technical Efficiency (TE) and scale efficiency (SE) are highly significant in determining the ROE of commercial banks in Kenya. The TE under the constant returns to scale (CRS) assumption returned a positive coefficient of 150423.2. This implies that a unit change in TE, would lead to a corresponding increase in ROE of 150423.2. The result is however negative for TE under the variable returns to scale (VRS) and SE. These findings are supported by a p value of 0.0000, which is less than the conventional p value 0.05.

With respect to SE, the extent to which a firm can take advantage of economies of scale by altering its size towards achieving an ideal scale of operation, the results indicate that, a unit increase in SE produces a corresponding reduction of -150359.7 in ROE. This implies that, as banks strive to expand in size by creating new branches and diversifying their product offering to increase their scale of operations, the decision might be counterproductive as it leads to a reduction in ROE and therefore needs to be carefully evaluated.

Therefore, to ensure a positive and growing ROE, bank managers must strive to expand the net income through efficient management of operating expenses, interest expenses and developing strategies to attract a retain more customers and build a

strong deposit base. The findings of this study are consistent with Sporta et al (2017), who found that operational efficiency has a positive and significant relationship with financial performance of commercial banks in Kenya.

Table 4.28: Regression Output on TE and SE on Return on Equity (ROE)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	149746.2	17298.24	8.656733	0.0000
EFFICIENCY_CRS_	150423.2	17378.16	8.655879	0.0000
EFFICIENCY_VRS_	-149782.0	17309.60	-8.653117	0.0000
EFFICIENCY_SE_	-150359.7	17366.81	-8.657878	0.0000
Error Distribution				
SCALE:C(5)	2.149263	0.438717	4.898979	0.0000
Mean dependent var	28.29167	S.D. dependent var		6.174060
S.E. of regression	2.814046	Akaike info criterion		5.201461
Sum squared resid	55.43200	Schwarz criterion		5.403505
Log likelihood	-26.20876	Hannan-Quinn criter.		5.126657
Avg. log likelihood	-2.184064			
Left censored obs	0	Right censored obs		0
Uncensored obs	12	Total obs		12

Table 4.29, indicates the findings of the effect of efficiency on return on assets (ROA). Contrary to findings on the effect of efficiency on ROE, it is found that Technical Efficiency (TE) and Scale Efficiency (SE) are highly insignificant in determining the ROA of commercial banks in Kenya. The TE under the constant returns to scale (CRS) assumption returned a positive coefficient of 7619.387. This implies that a unit change in TE, under CRS would lead to a corresponding increase in ROA of 7619.387. The result is however negative for TE under the variable returns to scale (VRS) and SE with coefficients of -7566.675 and -7604.839 respectively. Since the p values of Efficiency - CRS (0.1275), Efficiency - VRS (0.1286) and Efficiency - SE (0.1279) are greater than 0.05, indicates that bank efficiency has no significant effect on return on assets (ROA). The outcome of the effect of bank efficiency on ROE and ROA is mixed.

Table 4.29: Regression Output on TE and SE on Return on Assets (ROA)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	7555.831	4976.081	1.518430	0.1289
EFFICIENCY_CRS_	7619.387	4999.072	1.524160	0.1275
EFFICIENCY_VRS_	-7566.675	4979.351	-1.519611	0.1286
EFFICIENCY_SE_	-7604.839	4995.806	-1.522245	0.1279
Error Distribution				
SCALE:C(5)	0.618266	0.126203	4.898979	0.0000
Mean dependent var	3.458333	S.D. dependent var		0.806179
S.E. of regression	0.809500	Akaike info criterion		2.709537
Sum squared resid	4.587027	Schwarz criterion		2.911581
Log likelihood	-11.25722	Hannan-Quinn criter.		2.634732
Avg. log likelihood	-0.938102			
Left censored obs	0	Right censored obs		0
Uncensored obs	12	Total obs		12

4.14.2 Determinants of Bank Financial Intermediation Efficiency

In this section, we present the results on the determinants of bank efficiency. The truncated (censored) Tobit regression model was applied. This is because, efficiency values are restricted to between 0 and 1, and therefore use of the ordinary least squares(OLS) or generalized regression models (GMM) would be misleading. The general regression equation is specified as follows:

$$(Eff_{it}) = \beta_{i0} + \beta_{i1}X_{i1} + \beta_{i2}X_{i2} + \beta_{i3}X_{i3} + \beta_{i4}X_{i4} + \beta_{i5}X_{i5} + \varepsilon_{it} \quad (3)$$

Where: Eff. Represents Bank Efficiency, X_{i1}, Bank Size, X_{i2}, Capital Adequacy, $X_{i3,}$ Liquidity Risk, $X_{i4,}$ Market Capitalization and X_{i5} is the leverage. β_{i0} is the constant and $\beta_{i1} - \beta_{i5}$ are coefficients and ε is the error term, i represents the banks identifier, t is the time dimension of the data.

Table 4.30 shows the output of the determinants of efficiency. The results, under the VRS assumption show that only Capital Adequacy and Market Capitalization are significant in determining the TE of a bank. The result is supported by the p values 0.0315 and 0.0253 respectively, which are less than the conventional p value of 0.05. This means that, a unit change in Capital Adequacy would result in a reduction in

financial intermediation efficiency by 0.012650, while market capitalization would lead an increase in efficiency by 0.040274. Further, the results show that bank size (p = 0.2526), liquidity risk (p = 0.7729) and financial leverage (p = 0.0637) are insignificant, hence have no influence on bank efficiency.

Table 4.30: Determinants Efficiency –Variable Returns to Scale (VRS)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.626430	0.547664	-1.143822	0.2527
BANK_SIZE	0.021108	0.018452	1.143937	0.2526
CAPITAL_ADEQUACY	-0.012650	0.005881	-2.151133	0.0315
LIQUIDITY_RISK	0.000446	0.001546	0.288519	0.7729
LEVERAGE	0.006928	0.003736	1.854305	0.0637
MARKET_CAPITALIZATION	0.040274	0.018010	2.236213	0.0253
Error Distribution				
SCALE:C(7)	0.009280	0.001894	4.898979	0.0000
Mean dependent var	0.995848	S.D. dependent var		0.013319
S.E. of regression	0.014377	Akaike info criterion		-5.355162
Sum squared resid	0.001034	Schwarz criterion		-5.072300
Log likelihood	39.13097	Hannan-Quinn criter.		-5.459887
Avg. log likelihood	3.260914			
Left censored obs	0	Right censored obs		0
Uncensored obs	12	Total obs		12

Similarly, Table 4.31 shows the output on the determinants of efficiency under the CRS assumption. The results indicate that, all the bank-specific variables; bank size (p = 0.0000), capital adequacy (p = 0.0000), liquidity risk (p = 0.0000), leverage (p = 0.0000), and market capitalization (p = 0.0145) are significant in influencing the efficiency of a bank. This result is supported by p values of 0.0000 and 0.0145 respectively, which are less than the conventional 0.05.

Table 4.31: Determinants Efficiency –Constant Returns to Scale (CRS)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	1.508978	0.619970	2.433952	0.0149
BANK_SIZE	-0.106049	0.020888	-5.076916	0.0000
CAPITAL_ADEQUACY	-0.027748	0.006657	-4.168024	0.0000
LIQUIDITY_RISK	0.013107	0.001750	7.489308	0.0000
LEVERAGE	0.025444	0.004230	6.015611	0.0000
MARKET_CAPITALIZATION	0.049820	0.020388	2.443639	0.0145
Error Distribution				
SCALE:C(7)	0.010506	0.002144	4.898979	0.0000
Mean dependent var	0.979040	S.D. dependent var		0.031132
S.E. of regression	0.016275	Akaike info criterion		-5.107141
Sum squared resid	0.001324	Schwarz criterion		-4.824278
Log likelihood	37.64284	Hannan-Quinn criter.		-5.211866
Avg. log likelihood	3.136904			
Left censored obs	0	Right censored obs		0
Uncensored obs	12	Total obs		12

In Table 4.32 shows the output on the determinants of Scale Efficiency (SE) of the banking sector. The results indicate that, all bank specific variables; bank size (p = 0.000), capital adequacy (p = 0.0014), leverage (p = 0.0000), Liquidity risk (p = 0.0000) are significant in influencing bank efficiency. However, the results show that market capitalization (p = 0.5056) is insignificant in influencing SE of the banking sector.

Table 4.32: Determinants Efficiency – Scale Efficiency (SE)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	3.129009	0.442129	7.077139	0.0000
BANK_SIZE	-0.127081	0.014897	-8.530905	0.0000
CAPITAL_ADEQUACY	-0.015141	0.004748	-3.189221	0.0014
LIQUIDITY_RISK	0.012668	0.001248	10.15068	0.0000
LEVERAGE	0.018561	0.003016	6.153373	0.0000
MARKET_CAPITALIZATION	0.009679	0.014539	0.665681	0.5056
Error Distribution				
SCALE:C(7)	0.007492	0.001529	4.898979	0.0000
Mean dependent var	0.983163	S.D. dependent var		0.029731
S.E. of regression	0.011607	Akaike info criterion		-5.783280
Sum squared resid	0.000674	Schwarz criterion		-5.500418
Log likelihood	41.69968	Hannan-Quinn criter.		-5.888006
Avg. log likelihood	3.474973			
Left censored obs	0	Right censored obs		0
Uncensored obs	12	Total obs		12

From this finding, there is strong indication that the independent variables tested, have a strong influence on bank efficiency in Kenya, ceteris Paribas. The results therefore lead to the conclusion that bank size, capital adequacy, liquidity risk, leverage and market Capitalization have a significant effect on bank efficiency. The findings are consistent with Banna et al. (2017), who, on examining the effect of the global financial crisis and other factors on the efficiency of Bangladesh commercial banks, using the Data Envelopment Analysis (DEA), found that financial crisis, bank size, capital adequacy ratio, average return on equity and real interest rate had a significant effect on bank efficiency in Bangladesh.

Similarly, the finding on capital adequacy, as a determinant of bank efficiency is consistent with Yener et al. (2007) who found a negative relationship between capital adequacy and bank operating efficiency. The findings are further supported by Delis and Papanikolaou (2009), and Tecles & Tabak (2010), who found a positive relationship between capitalization and bank efficiency.

From this findings, it can be observed that adequately capitalized banks are able to utilize available investment opportunities as and when they arise while at the same time mitigate the risks associated with operations. The banking sector in Kenya could therefore be argued to have preference to more capital holding behaviour with low risk appetite. Further, the findings are consistent with Muazaroh et al. (2012), who found that capital adequacy has a positive and significant effect on efficiency. The findings are further supported by Gwahula (2013), who found that bank efficiency is influenced by both bank specific, industry specific and macroeconomic factors. He showed that, bank size, profitability measured by NIM, liquidity, as well as capital adequacy had a significant effect bank efficiency in Tanzania. The study also indicated that industry specific and macroeconomic factors; market share and market concentration and GDP had a significant influence on bank efficiency while Non performing loans (NPL), ownership and Consumer Price Index (CPI) were insignificant. The findings are also supported by Odunga et al. (2013) who showed that liquidity increases with operating efficiency.

To this end, banks maintain high liquidity so as to meet demand deposits by customers and avoid possibility of bank runs. The efficiency of the bank is therefore improved. Similarly, the results are supported by Wheelock and Wilson (2009), who reported a positive and significant relationship between bank efficiency and bank size. This finding, on the relationship between bank size and efficiency is further reinforced by Hughes et al. (2001). They argued that, due to their ability to access and mobile resources, both human and material, large banks by size, are expected to be more efficient relative to small banks. The access and ability to mobilise resources enables big banks to improve on their efficiency level.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Consistent with the research purpose and objectives, this chapter presents the summary of the findings, conclusions and proposed policy recommendations. The recommendations made shall inform policy decisions that will feed in to the efficiency improvement framework. The summary is arrived at, following the outcome of the hypotheses tests from both primary data and secondary data. Further, conclusions for each of the research objectives is developed and discussed. The findings of the study, together with the restrictions faced, formed the basis of recommendations for policy makers, corporate managers, academia as well as submissions for auxiliary investigation at the end of the research.

5.2 Summary

The basis of the study was on the lack of specificity and clarity on the effect of financial intermediation efficiency on the performance of commercial banks in Kenya. The general objective of the study; to determine the effect of financial intermediation efficiency on performance of commercial banks in Kenya, facilitated analysis of the results from different perspectives of efficiency to provide specificity and clarity on the research problem. The need for knowledge, on the effect of financial management efficiency on performance of banks was apparent. This aspect was clearly pronounced, due to lack of consensus in extant literature reviewed for the study. Additionally, the Kenyan environment, as distinct from those reported in literature, provided a dilemma on the concept and measurement of financial performance following the efficiency approach. The studies on bank efficiency in Africa and the region, provided conflicting results on the effect of efficiency on performance, thus compounding the need to undertake the study.

5.2.1 Banking Efficiency

Banking efficiency was analyzed to determine its influence on financial performance. The efficiency of a bank, is determined by its ability to generate maximum output without varying the amount of input. The capability to minimize wastage and maximize productivity without changing the inputs in the production process is of imperative importance. From the results presented in chapter four, the productivity and efficiency of the banking sector in Kenya is seen to be strong, an observation reinforced by the general performance of the segment, supported by other sectors of the economy. Four aspects of banking efficiency were analyzed; financial management efficiency, corporate governance structural efficiency, financial services efficiency and financial information efficiency. Further, we screen other aspects of efficiency such as technical and scale efficiency and their effect on bank performance. Other key drivers of efficiency such as bank size, market capitalization, liquidity risk, capital adequacy and leverage were also analyzed.

5.2.2 Financial Management Efficiency on Performance

In the first objective, the study aimed to determine the effect of financial management efficiency on the performance of banks listed on the Nairobi Securities Exchange (NSE). The gist of this objective, was to assess the extent to which prudent financial management influences the overall profitability performance of the banking sector. This aspect is explained by the level of managerial conformity with the existing regulatory frameworks governing banking operations. From bivariate regression analysis, the findings indicate that there is a strong and positive relationship between financial management efficiency and performance of banks in Kenya, as shown by the beta coefficient. This finding therefore, alludes to the fact that commercial banks in Kenya, practice efficient financial management. In this connection, a unit increase in financial management efficiency would trigger and a change in performance of a bank.

The null hypothesis is therefore rejected. Notably, financial management efficiency parameters were analyzed from the specific lens of the CAMEL ratios, which are of keen interest to the regulators. The ratios provided the construct used in the study, to

obtain responses required in the research instrument. The ratios used included the capital adequacy, Liquidity risk, Market capitalization, Financial leverage and bank size among others.

5.2.3 Corporate Governance Structural Efficiency and Bank Performance

In the second objective, the target was to determine the effect of corporate governance structural efficiency on performance of banks in Kenya. The objective was analyzed from a two-dimension perspective; board structure & composition and Transparency & Disclosure. On board structure and composition, the study zeroed in on board size, board meetings and schedule and the duality of the role of the Chief Executive Officer. Similarly, Transparency and disclosure targeted, the disclosure information on the remuneration to board of directors, ownership and shareholding, online publication of corporate information and appointment of auditors & audit fees. The fact that good corporate governance is key in the management and ensuring improved performance of corporate entities cannot be overemphasized. Organizations that have embraced good corporate governance mechanisms have exhibited improved performance.

The findings on board structure and composition, indicate that, it is a significantly important parameter in defining bank performance. With respect to board size, the results suggest that smaller boards are more preferable than larger ones, since they are not afflicted by communication problems, espouse superior and healthier exchange of ideas and are better able to closely monitor opportunistic managerial behavior.

Similarly, the findings indicate that the boards of commercial banks in Kenya are well constituted to include independent board members, thus reducing managerial buccaneering and reduction in agency problems and associated costs.

Board meetings play an important role in enhancing managerial performance. The findings showed that, board meetings were called on schedule, an aspect that directly impacts on the banks' operational strategy. The higher frequency of meetings witnessed, provides evidence of close monitoring of bank operations and supports

the stellar performance of the banking sector. This is because it ensures a stronger unity of purpose for the board of directors through constant engagement. Specifically, the decisions resulting from the outcome of the board meetings are implemented without undue delay associated with infrequent meetings, lending credence to the good performance of the sector.

Further, the findings also reveal that there is a clear definition and separation of the role of the Chief Executive Officer and the Chairman. Clearly defining the roles and functions of the board and management facilitates ease of operations and coordination of the strategic direction of the bank. Duality of the role of the Chief Executive Officer is an important corporate governance aspect causing the problem of information asymmetry. Where the role of the CEO and that of the Chairman are not clearly separated, potential conflict of functions held by the same individual abound. The separation of the role of Chairman and Chief Executive provides the requisite control mechanisms that facilitate efficiency, that impact on the overall financial performance of the bank as a result of prudent decision making. This could explain the stellar performance depicted by the banking sector in Kenya.

Finally, the findings reveal that commercial banks have espoused transparency and disclosure in their operations on Key aspects such as, remuneration to board of directors, ownership and shareholding, online publication of corporate information and appointment of auditors & audit fees. On disclosure of remuneration to board of directors and other employee costs, implies that banks in Kenya provide information relating employee costs and directors' remuneration in their financial statements.

This practice helps to improve the degree of transparency of the banking operations by availing information to investors to enable them make informed decisions. The findings further indicate that commercial banks disclose information on their shareholding structure. Board ownership and shareholding, provides the managers with an incentive to pursue investment strategies that increase firm value. The disclosure of the information in the financial reports, lends confidence to both the existing and the potential shareholders on the wealth growth. The results therefore

are an indication of adequacy in disclosure of the shareholding of the bank in the financial statements.

On the use of technology, the findings provide that banks leverage on the use modern technology to enhance their presence and visibility. Banks publish their corporate information on the internet. This finding implies that banks in Kenya facilitate access to their financial performance information for public scrutiny on all operational aspects of the firm through the use of the internet This finding reinforces the significance of effective corporate disclosure, to enhance the mutually beneficial relationship between shareholders and managers. Corporate financial information disclosure is key in facilitating informed decisions by the users of the said information. The information is important for estimation of the value of the firm and access to other details that enhance competitiveness. On appointment of Auditors and disclosure of audit fees in the financial statements, the findings indicate that auditors are appointed on rotation and there is disclosure of audit fees. Similarly, the findings also provided an indication that some banks did not rotate their auditors nor disclose the audit fees payments, which is against good corporate governance practice.

From this finding, it can be argued that rotation of auditors has no consequence, since due to the fear of potential litigations, the auditor shall endeavor to perform the audit assignment diligently so as to protect their reputation thus making rotation unattractive. Similarly, the cost of auditor rotation maybe unaffordable to both the auditor and the client hence making it undesirable.

5.2.4 Financial Services Efficiency on Financial Performance

In the third objective, the aim was to determine the effect of financial services efficiency of a bank on performance. The financial services efficiency analyzed were; accessibility to customer transactions management systems, reliability and dependability of the payments systems, the level of geographical coverage of banking services such as ATMs, POS, Debit and Credit cards, the level of technology adopted by the bank, the degree of fraud and breaches in the banking operations, the level of financial innovations adopted by the bank such as mobile and online banking and the volume of transactions processed on a daily basis. This

aspects of financial services are key in determining the level of efficiency of banking operations and as such, significantly contribute to the overall financial performance of the bank. The findings showed that financial services efficiency had a strong, positive and significant effect on performance. In this regard, banks need to strengthen their services and ensure that the highest level of efficiency is achieved. The adoption of new technologies should facilitate ease of access to products and services.

5.2.5 Financial Information Efficiency on Financial performance

The fourth objective concerned the effect of financial information efficiency on performance of commercial banks.

The quality of good financial information is important in enabling informed investment decisions by the users. This information according to the international accounting standards must be accurate, reliable, comparable and understandable. To avoid the problem of asymmetry, the information needs to be provided at a reasonable cost. Key information by banks, relate to transaction charges and other fees levied by the banks. Due to stiff competition, this charges vary from one bank to another in their bid to attract customers. The findings of the study showed that, there is a strong and positive relationship between financial information efficiency and performance. This implies that, a unit increase in financial information efficiency, leads to an increase performance of commercial banks, implying that financial information efficiency is a good predictor of performance. The efficiency of financial information translates to reduced default risk for commercial banks, due to information disclosure, occasioned by a decline non-performing loan balance. Similarly, the portfolio at risk (PAR) and the loan loss provisioning by the banks also reduces and the bank can therefore reinvest its earnings in more productive investments thus leading to improved asset quality. The findings further indicate that financial information efficiency facilitates reduction in transaction costs, boosted sales revenues, thus ensuring that the bank earns more profit from the alternative income streams form interest and non-interest income.

The findings also revealed that banks provided clear, accurate, reliable, comparable and understandable information at a lower cost, a quality of good accounting information and a requirement of the International Accounting Standard (IAS). This information is important in aiding good investment decision making for bank managers and investors alike. Banks in Kenya therefore, need to reestablish the information provision mechanism and ensure strict compliance to the international standards.

Finally, the findings also show that customer information sharing with credit reference bureaus (CRB) has improved compliance and efficiency of collection of debtors, which has improved the financial performance of the banks.

5.2.6 Effect of Technical efficiency on performance of commercial banks

The fifth objective was to determine the effect of Technical Efficiency on the performance of Commercial Banks. The analysis involved decomposition of the Technical Efficiency under the constant returns to scale (CRS) and variable returns to scale (VRS) to obtain the Scale efficiency (SE) of the Banks. The findings reveal that, Technical Efficiency (TE) and scale efficiency (SE) are highly significant in determining the ROE for commercial banks in Kenya. This implies that, a unit change in TE, would lead to a corresponding increase in performance, measured by ROE. However, the results are negative for TE under the variable returns to scale (VRS) and Scale Efficiency (SE). With respect to SE, the extent to which a firm can take advantage of economies of scale, by altering its size towards achieving an ideal scale of operation, the results indicate that, a unit increase in SE produces a corresponding reduction in performance, measured by ROE. This implies that, as banks strive to expand in size by creating new branches and diversifying their product and service offering to increase their scale of operations, the decision might be counterproductive as it leads to a reduction in ROE. Therefore, to ensure a positive and growing ROE, bank managers must strive to expand the net income through efficient management of operating expenses, interest expenses and developing strategies to attract a retain more customers and build a strong deposit base.

Similarly, the study measured the effect of Technical Efficiency on return on assets (ROA). Contrary to findings on the effect of efficiency on ROE, it is found that Technical Efficiency (TE) and Scale Efficiency (SE) are highly insignificant in determining the ROA of commercial banks.

The results show that Technical Efficiency had a strong and positive relationship with performance measured by ROA. TE under the constant returns to scale (CRS) assumption, returned a positive coefficient, implying that a unit change in TE, would lead to an increase in ROA. The result is however negative for TE under the variable returns to scale (VRS) and SE. The findings reveal that Technical Efficiency has no significant effect on performance as measured by return on assets (ROA).

5.2.7 Determinants of commercial Banks' Financial Intermediation Efficiency

In the sixth objective, we analyze the determinants of Bank efficiency. Extant literature documents a number of factors influencing bank efficiency. Identification of this factors enables the banks, both new and existing, to develop strategies and mechanisms of increasing their efficiency levels. The results, under the VRS assumption show that only Capital Adequacy and Market Capitalization are significant in determining the TE of a bank. This means that, a unit change in Capital Adequacy would result in a reduction in financial intermediation efficiency, while market capitalization would lead an increase in efficiency by. Further, the results show that bank size, liquidity risk and financial leverage were insignificant, hence have no influence on bank efficiency. This finding indicates that, bank managers should concentrate their efforts in improve their capital adequacy ratios and market capitalization.

Similarly, the findings, under the CRS assumption, reveal that, all the bank specific variables; bank size, capital adequacy, liquidity risk, leverage, and market capitalization are significant in influencing the efficiency of a bank. With respect to Scale Efficiency (SE), the results indicate that, all variables were highly significant in influencing bank efficiency, with the exception of market capitalization which was found to be insignificant.

From this findings, there is strong indication that, the independent variables tested, have a strong influence on bank efficiency in Kenya, ceteris Paribas. The results therefore lead to the conclusion that bank size, capital adequacy, liquidity risk, leverage and market Capitalization have a significant effect on bank efficiency.

From this results, it can be observed that adequately capitalized banks are able to utilize available investment opportunities as and when they arise, while at the same time mitigate the risks associated with operations. The banking sector in Kenya could therefore be argued to have preference for more capital holding behaviour, with low risk appetite. The banks also maintain high liquidity so as to meet demand deposits by customers and avoid the possibility of bank runs.

5.3 Conclusion

Several conclusions can be derived from the findings presented herein, leading to possible policy recommendations. The following subsections provide brief discussions on the specific facets.

5.3.1 The level of Financial Intermediation Efficiency of Commercial Banks

The level of efficiency in the banking sector in Kenya is still below par and varied. The analysis was carried out in two stages using primary data which utilized well-structured closed ended questionnaires and secondary data, collected from the annual financial reports available at the NSE. To determine the level of intermediation efficiency for commercial banks in Kenya, non-parametric Data Envelopment Analysis (DEA) approach was used. This approach was aided by the use of secondary data. The results revealed that, banks in Kenya, presented low inefficiency levels, indicating that there were less losses in the commercial banks' intermediation process. The individual bank efficiency scores were calculated and the average annual score for the period obtained. The findings further revealed that, banks in Kenya still have an opportunity to improve their performance without changing their current inputs, through effective management to achieve targeted and higher levels of output. To facilitate efficiency improvement, inputs such as personnel costs should be properly controlled through enhanced management and supervision.

Financial management efficiency was further analyzed, to establish the effect on financial performance. In this regard, key financial management aspects associated with the CAMEL components were assessed. The results reveal that, CAMEL components, as measures of financial management efficiency and compliance mechanisms, were highly significant in determining bank performance. The implication of this result is that, banks become incrementally efficient, when there is an upsurge in their capital, meaning that large banks compared to small banks are more efficient. The argument that can be advanced here is that adequately capitalized banks enjoy scale economies and can be able to cover their operational risks. The mitigation measures against bank failures is therefore efficient management of financial resources and application of prudent policy framework to guide managerial decisions. The study further evaluated the effect of corporate governance structural efficiency on performance. The findings reveal that there is a strong and positive relationship between governance structural efficiency and performance. Governance efficiency infers the administrative competency of the board, to make decisions on effective management of the inputs taking cognizance of the expected related output.

Management of employee costs, interest expenses and facilitating mobilization of customer deposits are key indicators of managerial efficiency. Besides, board structure and composition, size, independence of the board members among others, reveal pertinent issues of concern to the present bank manager. The results show that, lean boards, with independent board members are consistent with improved efficiency and performance. Transparency and timely disclosure of accurate, reliable, comparable and understandable financial information is the key to efficiency improvement.

The findings indicate that, disclosure on staff costs and directors' remuneration, use of online publishing of corporate information, ownership &shareholding disclosure, appointment & rotation of auditors and audit fees disclosure, provide useful information to investors enabling them make informed decisions. Thus, it is imperative for banks to embrace full disclosure, transparency and accountability of operations, to survive the extremely complex and constantly changing business environment. Corporate governance mechanisms, are therefore, significantly

important for business sustainability and performance. They provide a framework in which banks are able to continually improve their performance by alleviating the agency problem predisposition. As such, board structure and composition determines the strategic direction of the bank and its routine operational dynamics.

Further, in order to enhance financial services efficiency, banks need to ensure that accessibility to customer transactions management systems, reliability and dependability of the payments systems, the level of geographical coverage of banking services, including but not limited to ATMs, POS, Debit Cards, Credit Cards, Mobile Phone Banking and the level of technology adopted by the bank, need to be enhanced to guarantee customer confidence. The findings reveal that there is a strong and positive relationship between financial services efficiency and performance. To achieve improved performance, banks need to ensure zero or minimal instances of fraud and breaches in the banking operations. Similarly, banks need to reengineer to create new and innovative products, such as mobile and online banking, so as to increase the volume of transactions processed on a daily basis. The efficiency of the banks is therefore, significantly dependent on the provision of financial, thus significantly contributing to the overall financial performance. The cost of information, is inherent in the efficiency with which such information is availed, to aid in the decision making process.

That bank charges and other transaction costs related to its operations, affect the efficiency of financial information. In this regard, the findings indicate that, there is a strong and significant relationship between financial information efficiency and performance. Banks should, therefore, ensure that their transaction costs are comparable, thus giving customers limited exit choices leading to reduced default risk leading to improved efficiency and overall financial performance. Similarly, the portfolio at risk (PAR) for the bank also reduces and therefore the banks books will show a true and fair view while the loan loss provision by the banks also reduces and therefore the bank can reinvest its earnings in more productive investments thus leading to improved asset quality.

5.4 Recommendations

5.4.1 Managerial Recommendations

The level of economic success of a country, is dependent on performance, the velocity of economic activities and stability of the financial system. The financial institutions comprise a vital part the financial system. For sound economic development to be achieved, financial intermediation efficiency of the banking sector is fundamental. Thus, intermediation efficiency measurement provides an important insight into the economic growth, development and advancement of a country. Over time, to achieve the desired efficiency, productivity and performance outcomes, governments have implemented reform strategies to stabilize the financial sector. Kenya's regulatory reforms, dating back to the 1980s, have progressively improved and deepened the financial sector operations and have guaranteed a stable financial system. Therefore, from the ensuing conclusions, the following managerial recommendations and their corresponding implications are submitted. Firstly, despite the strong, positive and significant relationship between financial intermediation efficiency and performance, banks in Kenya, and the banking sector at large is not fully efficient. There is need for bank managers to fully and optimally utilize the current level of inputs; total customer deposits, total operating expenses, interest expenses among others to boost the loan book, other incomes and interest income. Secondly, bank managers should address the financial efficiency aspects by enforcing and ensuring frugal financial management decisions. This will address the liquidity risk challenges, and asset quality improvement through proper and effective financial planning. Thirdly, there is need to strengthen corporate governance mechanisms and oversight of managerial operations. There is need to espouse transparency and disclosure to guarantee investor confidence. Board meetings as a monitoring tool is critical and should be structured to drive the strategic direction of the bank.

5.4.2 Policy Recommendations

Development and formulation of appropriate policies for the banking sector support efficiency improvement. The Central Bank of Kenya should continue to develop and

ensure strict implementation and compliance by commercial banks, with policies geared towards efficiency improvement. The CBK should also enforce the compliance with international regulatory requirements such the Basel Accord and other standards such as IFRS 9.

Corporate governance structural efficiency was established to be strong, positive and significantly related to performance. Although this relationship is appreciated, there is need to develop policy frameworks to guide on the different corporate governance aspects such as board structure and composition, transparency and disclosure and other corporate governance practices to facilitate implementation and compliance. Banking institutions should be required to have well diversified boards with independent directors, espouse transparent disclosure on their operations, provide information that is accountable, reliable, comparable and understandable, to achieve the required level of corporate governance practices. The Central Bank of Kenya (CBK), ought to therefore, ensure that policy guidelines are developed and commercial banks compliance monitored.

Technological advancement has simplified the banking operations, as customers prefer more of the convenience banking approach. Most customers therefore access banking services through mobile phones or through the internet at a convenience fee. The CBK should therefore develop a policy framework to govern, the type and amount of convenience fees charged by the banks for similar transactions such as bank balance checks and funds transfers to avoid exploitation of customers. In general, customer transaction management systems, should be properly guided by a framework that will ensure minimal risk exposure by the financial institutions. Similarly, due to strict regulations, complexity of operations and rivalry in the financial sector in service delivery, there is need to develop and implement policies that encourage and support fair competition. These policies will aid in boosting profitability and guarantee fair pricing in the sector. There is need to ensure financial management efficiency through a proper and structured policy framework. Banks are recommended to strengthen capital adequacy, liquidity, market capitalization and reduce the degree of financial leverage. This will facilitate banks to increase their efficiency, by supporting their capability to lend, and to insulate them in the event of

a bank run or bank failure. Finally, the banks should safeguard against key sources of inefficiency, such as improper allocation and utilization of resources such as labour, implying that banks have excessive human resource that is not productive or fully utilized. Here, it is recommended that banking activities are increased or the redundant human resource is restructured to achieve optimal operational levels.

5.5 Areas for further research

The gist of the research targeted the effect of financial intermediation efficiency on performance of commercial banks listed on the Nairobi Securities Exchange, in Kenya. Firstly, while the study adopted Return on Assets (ROA) and Return on Equity(ROE) as measures of bank performance, future research can be expanded to include other performance indicators such as; Return on Investment, Tobins' Q, Stock Market Returns, Net interest Income or any other such indicator of bank performance that is plausible. The population of study adopted in future, can comprise all commercial banks in Kenya, to enable better inference and generalisation on the results.

Secondly, prospective investigation, maybe carried out to include, a cross country analysis of banking efficiency and performance. The East African Region is currently liberalised with cross listing of firms, therefore, a study on a comparative efficiency analysis would be worthwhile. Thirdly, the current study may have been limited with respect to the specific constructs of the selected variables. There may be need to expand the number of constructs used in the study to provide a wider coverage of the responses and therefore ensure that the findings are more robust. Fourthly, from the literature reviewed, it revealed that majority of the efficiency studies focused on commercial banks. In this regard, future studies may also seek to evaluate the efficiency of other institutions. To name but a few, micro-finance institutions, SACCOS, insurance companies, Educational Institutions, hospitals among others may be targeted in subsequent researches, to afford an enhanced application of efficiency as a concept. Fifthly, future research can be expanded to focus on the motivational aspects of good Corporate Governance, that promote efficiency driven performance. Sixth, prospective inquiry can be undertaken to

comparatively analyze the results of different investigative models for efficiency studies. This will facilitate profound understanding of the efficiency concept and consistency of the research results. Further, the researches can also incorporate more input and output variables, to mitigate on the sampling error as well as selecting variables different in form for this type of study.

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APPENDICES

Appendix I: Letter of Authorization

The Manager
Name of the Bank……..
P.O. Box ……

Dear Sir,

Re: Research Data on "Effect Of Financial Intermediation Efficiency On Financial Performance Of Commercial Banks Listed On The Nairobi Securities Exchange, Kenya"

My name is Mr. Omete Francis, a student pursuing a Doctorate Degree in Business Administration- Finance Option at Jomo Kenyatta University of Agriculture and Technology. I' am undertaking a research thesis in partial fulfillment for the award of said degree, on the above stated topic. My kind request is for your assistance to facilitate the achievement of the objective of this research. The purpose of this letter is therefore to request for your permission to collect relevant data from your organization from selected respondents among your management staff. The information collected will be treated with utmost confidentiality and strictly used for the purposes of this research only.

Sincerely

Mr. Omete F. Ikapel

HD433-C008/3000/2012

Appendix II: Questionnaire

The purpose of this questionnaire is to collect information regarding Effect of Financial Intermediation efficiency on Financial Performance of commercial banks listed on the Nairobi Securities Exchange, Kenya

SECTION A: GENERAL INFORMATION

1. Name of the bank (Optional)…….
   …..
2. Gender of respondent Male [ ] Female [ ]

For how long have you worked in this company.

Code	No. Of Years Of Experience	Tick[√] As Appropriate
A3.1	0 – 5 Years	
A3.2	6 – 10 Years	
A3.3	11 – 15 Years	

The concept of bank efficiency

The following is a list of possible definitions of bank efficiency. Using the scale below, please identify the extent to which you agree or disagree about how appropriate you think each definition applies to your bank

5=Strongly Agree (SA), 4= Agree (A), 3= Neutral (N), 2 = Disagree (D), 1 = Strongly Disagree (SD)

S/No	Statement	5	4	3	2	1
		SA	A	N	D	SD
A4.1	The bank's ability to perform optimally, procedures involved in converting a set of inputs into outputs					
A4.2	Bank's effectiveness that produces minimum waste of resources; time, effort,					

	skill, finances, technology					
A4.3	The extent to which the bank can achieve optimal scale of operation by altering its size and inputs for maximum output					
A4.4	The bank's ability to generate and sustain high levels of profitability					

SECTION B: OBJECTIVES

FINANCIAL MANAGEMENT EFFICIENCY ON FINANCIAL PERFORMANCE

This section has statements regarding the effect of financial management efficiency on financial performance of commercial banks. Kindly respond by ticking in appropriate boxes that match your opinion, using a tick (√) as provided below.

5=Strongly Agree (SA), 4= Agree (A), 3= Neutral (N), 2 = Disagree (D), 1 = Strongly Disagree (SD)

S/No	Statement	5	4	3	2	1
		SA	A	N	D	SD
B1	Adequately capitalized banks are more stable and profitable					
B2	Our bank adopts budgeting and planning as a tool for improving financial management efficiency					
B3	Our bank maintains optimal liquidity to meet on demand cash requirements of depositors					
B4	Our bank management is effective in financial management decision making, contributing to better financial performance					
B5	Our bank is adequately capitalized, hence growing profitability					
B6	Our bank has complied with capital adequacy requirements of the central bank					
B7	Our bank has a short receivables duration leading to better liquidity management					
B8	Our bank obtains funds from the most cost effective source and utilizes it in the most					

	profitable investments to enhance profitability					

GOVERNANCE STRUCTURAL EFFICIENCY ON FINANCIAL PERFORMANCE

This section has statements regarding the effect of corporate governance structure efficiency on financial performance of commercial banks. Kindly respond by ticking in appropriate boxes that match your opinion, using a tick (√) as provided below.

5=Strongly Agree (SA), 4= Agree (A), 3= Neutral (N), 2 = Disagree (D), 1 = Strongly Disagree (SD)

S/No	Statement	5	4	3	2	1
		SA	A	N	D	SD
CA: Board Structure and Composition						
CA1	Board size of the bank is less than 9					
CA2	There is clear description of the roles of the board of directors					
CA3	The chairman and the CEO are different individuals					
CA4	There are independent directors on the board of directors					
CA5	The board of directors also constitute directors representing minority interests					
CA6	Meetings of board of directors are called as scheduled					
CB: Transparency and disclosure						
CB1	There is full disclosure of remuneration to board of directors and staff					
CB2	The annual report of ownership and shareholding is prepared					
CB3	Information on employee ownership is stated					
CB4	There is rotation of the appointment of the auditors					
CB5	The annual reports and accounts are available online					
CB6	Payments to auditors for consultancy services is disclosed					
CC: Corporate Governance practices						

CC1	Banks with a large board of directors are efficient and highly profitable					
CC2	A large board of directors is slow in strategic investment decision making thus reduces firm profitability					
CC3	The financial performance or otherwise of the bank is determined by the size of the board of directors					
CC4	A lean board of directors is efficient and contributes to better performance of the bank					
CC5	Boards with external directors are more efficient and contribute to better financial performance					
CC6	Independent boards are driven by the achievement of long term business goals					
CC7	Boards with no external directors are ineffective and are influenced by self-interests					
CC8	Poor board composition leads to increased inefficiency and poor firm performance					
CC9	Board members holding shares encourages efficiency due to desire to protect their interests					
CC10	Board shareholding enhances selection and choice of the most profitable investments					
CC11	Board shareholding positively influences the performance of the bank					

FINANCIAL SERVICES EFFICIENCY ON FINANCIAL PERFORMANCE

This section has statements regarding the effect of financial services efficiency on performance of commercial banks. Kindly respond by ticking in appropriate boxes that match your opinion, using a tick (√) as provided below.

5=Strongly Agree (SA), 4= Agree (A), 3= Neutral (N), 2 = Disagree (D), 1 = Strongly Disagree (SD)

S/No	Statement	5	4	3	2	1
		SA	A	N	D	SD
D1	Quick and simplified access to customer transactions management system increases transaction volume and profitability					

D2	Reliable and dependable payments system contributes to improved bank performance and profitability					
D3	A wide coverage of payment systems such as ATMs, POS, Debit & credit cards increases bank revenues sources and performance					
D4	Poor and obsolete technology contribute to inefficiency of payment system and depressed profitability					
D5	Fraud and breaches in the electronic payments system diminishes performance and profitability					
D6	Adoption of e-banking has increased competition and profitability of the banking sector					
D7	Adoption of financial innovations such as online and mobile phone banking has increased transparency and efficiency of banking					
D8	Issuance of a large number of debit & credit cards contributes to better profitability					
D9	Processing of large number of transactions through debit & Credit cards indicates greater efficiency and bank performance					

FINANCIAL INFORMATION EFFICIENCY ON FINANCIAL PERFORMANCE

This section has statements regarding the effect of financial information efficiency on financial performance of commercial banks. Kindly respond by ticking in appropriate boxes that match your opinion, using a tick (√) as provided below.

5=Strongly Agree (SA), 4= Agree (A), 3= Neutral (N), 2 = Disagree (D), 1 = Strongly Disagree (SD)

S/No	Statement	5	4	3	2	1
		SA	A	N	D	SD
E1	Our bank charges lower transaction costs for its products and services comparatively					
E2	Lower transaction costs has reduced default rate by borrowers					
E3	Lower interest charges has led to reduced loan loss provision and improved asset quality					
E4	Reduced transaction costs has contributed to increased sales revenues from increased interest and non-interest income					

E5	The bank provides information that is clear and understandable to investors at lower cost					
E6	The information provided by the bank is timely and accurate for fundamental security analysis					
E7	Overall, our bank provides information that is reliable and comparable in the market					
E8	Financial information sharing has improved the efficiency and our bank's financial performance					
E9	Operational costs of my bank affect the price of inputs such as personnel costs					

FINANCIAL PERFORMANCE

Using the scale below, please rate the performance of your bank in the last ten (10) years based on the statements indicated.

5=Strongly Agree (SA), 4= Agree (A), 3= Neutral (N), 2 = Disagree (D), 1 = Strongly Disagree (SD)

S/No	Statement	5	4	3	2	1
		SA	A	N	D	SD
F1	The bank has experienced increased profitability in the last ten (10) years					
F2	Our bank has experienced growth in return on assets in the last ten (10) years					
F3	Our bank has experienced growth in return on equity in the last ten (10) years					
F4	The bank's net income has increased in the last ten (10) years					
F5	The bank's total assets have increased in the last ten (10) years					
F6	The bank's average equity has increased in the last ten (10) years					

THANK YOU

Appendix III: List of Quoted Commercial Banks in Kenya

1. Barclays Bank of Kenya Limited Postal Address: P. O. Box 30120 – 00100, Nairobi Telephone: +254-20-4254000, 4254601 Fax: +254-20-2213915 E-mail: barclays.kenya@barclays.com Website: www.barclayskenya.co.ke Physical Address: Barclays Westend, Waiyaki Way, Westlands, Nairobi. Date Licenced: 1916 Peer Group: Large Branches: 108, Sales Centre: 1	**2. Co-operative Bank of Kenya Limited** Postal Address: P. O. Box 48231 - 00100 Nairobi Telephone: +254-20-3276000, 2776000, 0711049000, 0732106000 Fax: +254-20-2245506 E-mail: customerservice@co-opbank.co.ke Website: www.co-opbank.co.ke Physical Address: Co-operative House, 4th Floor Annex, Haile Selassie Avenue, Nairobi Date Licenced: 1st July, 1968 Peer Group: Large Branches: 142	**3. Diamond Trust Bank Kenya Limited** Postal Address: P. O. Box 61711 – 00200, Nairobi Telephone: +254-20-2849000, 0732121000, 0719031000, 0732121000, 0719031000 Fax: +254-20-2245495 E-mail: info@dtbafrica.com Website: http://www.dtbafrica.com Physical Address: DTB Centre, Mombasa Road, Nairobi. Date Licenced: 15th November, 1994 Peer Group: Medium Branches: 59
4. Equity Bank Kenya Limited Postal Address: P. O. Box 75104-00200, Nairobi Telephone: +254-20- +254 20 2262000/2262956 /2262828, 0763026000, 07633026956, 0763026828 Fax: +254-020-2737276 E-mail: info@equitybank.co.ke Website: www.equitybankgroup.com Physical Address: Equity Centre, 9th Floor, Hospital Road, Upper Hill, Nairobi. Date Licenced: 28th December 2004 Peer Group: Large Branches: 167 Sub-branches: 12	**5. I & M Bank Limited** Postal Address: P.O. Box 30238 – 00100, Nairobi Telephone: +254-20-3221000, 3271375/27, 0719088000, 0753221000 Fax: +254-20-2711994 E-mail: invest@imbank.co.ke Website: www.imbank.com Physical Address: I & M Bank House, 2nd Ngong Avenue, Off Ngong Road, Nairobi. Date Licenced: 27th March, 1996 Peer Group: Medium Branches: 34	**6. KCB Bank Kenya Limited** Postal Address: P. O. Box 48400 – 00100, Nairobi Telephone: +254-20-3270000, 2851000, 2852000, 0711012000, 0734108200 Fax: +254-20-2242408’ 2216405 E-mail: kcbhq@kcb.co.ke Website: www.kcbbankgroup.com Physical Address: Kencom House, 8th Floor, Moi Avenue, Nairobi. Date Licenced: 1st January 1896 Peer Group: Large Branches: 199
7. National Bank of Kenya Limited Postal Address: P. O. Box 72866 - 00200 Nairobi	**8. NIC Bank Limited** Postal Address: P. O. Box 44599 - 00100	**9. Stanbic Bank Kenya Limited** Postal Address: P. O. Box 72833 - 00200

Telephone: +254-20-2828000, 0711-038000, Fax: +254-20-311444/2223044 E-mail: info@nationalbank.co.ke Website: www.nationalbank.co.ke Physical Address: National Bank Building, 2nd Floor, Harambee Avenue, Nairobi. Date Licenced: 1st January, 1968 Peer Group: Medium Branches: 81	Nairobi Telephone: +254-20-2888000, 4849000, 0711041000, 0732141000 Fax: +254-20-2888505/13 E-mail: info@nic-bank.com Website: www.nic-bank.com Physical Address: N.I.C House, Masaba Road, Upper Hill, Nairobi. Date Licenced: 28th September, 1995 Peer Group: Medium Branches: 31	Nairobi Telephone: +254-20-3638000 /11 /17 /18 /20 /21, 3268000, 3269000, 0711-0688000 Fax: +254-20-3752901/7 E-mail: cfcstanbic@stanbic.com Website: www.cfcstanbicbank.co.ke Physical Address: CFC Stanbic Centre, Chiromo Road, Westlands Date Licenced: 1st June 2008 Peer Group: Medium Branches: 27
10. Standard Chartered Bank Kenya Limited Postal Address: P. O. Box 30003 – 00100, Nairobi Telephone: +254-20-3293000, 3293900, 3291000, 3294000, 0719081000, 0732104000, 0703093000 Fax: +254-20-3747880 E-mail: Talk-Us@sc.com Website: www.standardchartered.com Physical Address: Standard Chartered Building-Westlands Road- Chiromo Lane, Westlands, Nairobi. Date Licenced: 1910 Peer Group: Large Branches: 38; Agencies: 3; Sales Centres: 1		

Appendix IV: Secondary Data Collection Sheet

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
ROA															
ROE															
ROI															
TE															
AE															
SE															

KEY:
ROA: Return on Assets
ROE: Return on Equity
ROI: Return on Investment
TE: Technical Efficiency
SE: Scale Efficiency