

**THE EFFECT OF OPERATIONAL EFFICIENCY ON INTEREST RATE  
SPREAD AMONG COMMERCIAL BANKS IN KENYA**

**BY**

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## DECLARATION

This Research Project is my original work and has not been presented in any other University.

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This Research project has been submitted for presentation with my approval as University Supervisor.

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## **DEDICATION**

This project is dedicated to my family members and friends for their overwhelming support, encouragement and understanding even when the course was quite demanding.

## **ABSTRACT**

Interest rate spread remain a controversial area of study as some scholars link it to market forces and others to individual banks inefficiency, and even others link it to external macroeconomic forces. Banks that perform well manage to keep interest rate spreads wide. Most of the studies conclude that the spread is as a result of inefficiency in the banking sector. The general objective of this study was to investigate the effect of operational efficiency on interest rate spread among commercial banks in Kenya. The population of interest in this study comprised of the 43 commercial banks operating in Kenya as at December 2014. This study collected secondary data which was obtained from the financial results filled at Central Bank of Kenya, Central Bureau of Statistics and Annual Banking Survey reports. The study used both descriptive and inferential statistics in analyzing the data. Data collected was cleaned, sorted and collated. Descriptive statistics such as mean score, frequencies and percentages for each variable was calculated and tabulated using frequency distribution tables and graphs. The study concluded that operational efficiency positively and significantly influenced the interest rate spread among commercial banks in Kenya. The study recommended that the central banks should apply stringent regulations on interest rates charged by banks so as to regulate their interest rate spread. The study suggests that further studies should be conducted in similar study for longer period of 10 years. A similar study should also be carried out too on the effect of operational efficiency on interest rate spread incorporating other variables such as the prevailing macroeconomic in a country as opposed to the current study which took only six variables into account. A study can also be done in more than one country to make better the findings and provide more room for generalization. This is because the findings of this study are focused on the Kenyan banks alone.

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## LIST OF ABBREVIATIONS

CBK	-	Central Bank of Kenya
DEA	-	Data Envelopment Analysis
ES	-	Efficiency Structure
GDPPC	-	Gross Domestic Product Per Capita
HHI	-	Herfindahl - Hirschman index
IRS	-	Interest Rate Spreads
KBA	-	Kenya Bank Association
MP	-	Market Power
OE	-	Operational Efficiency
OECD	-	Organization for Economic Cooperation and Development
RMP	-	Relative Market Power hypothesis
ROA	-	Return On Asset
SCP	-	Structure-Conduct Performance
SPSS	-	Statistical Package for Social Sciences
SSA	-	Sub Saharan Africa

# CHAPTER ONE

## INTRODUCTION

### **1.1 Background to the Study**

Commercial banks are considered as profit serving institutions. They accept deposits, provide convenient means of payment, and lend money to their customers in addition to many other services. In return for these services, banks receive different charges and interest. Banks also do pay interest on various deposits. Banks bridge the gap between the needs of lenders and borrowers by performing three types of transformation; size transformation, maturity transformation and risk transformation. Generally, savers/depositors are willing to lend smaller amounts of money than the amounts required by borrowers. Banks collect funds from savers in form of small size deposits and repackage them into larger-size loans. Banks perform this size transformation function exploiting economies of scale associated with the lending/borrowing function, because they have access to a larger number of depositors than any individual borrower. Banks transform funds lent for a short period of time into medium and long-term loans. Savers on the other hand, wish to minimize risk and prefer their money to be safe (Casu & Girardone, 2006).

Commercial banks' activities greatly rely on their intermediation services, filling the gap between suppliers and demanders of funds. Their profitability is partly due to the difference in interest rates charged on loans and what is paid to suppliers of funds. Njuguna and Ngugi (2000) argue that the larger the spread between loan and deposit rates, the more likely the necessary condition for intermediation to occur can be met. Earlier explanations that allow positive spread to be maintained rest on the ability of commercial banks to minimize transaction costs in loans originating through their intermediation services.

The Banking sector of an economy plays a vital role in economic growth and development of a country through vital monetary policy. Banks facilitate trade and commerce by providing

safe keeping of cash, means of making payments through the accounts of their clients, finance with appropriate advice on financial matters related to the local as well as international markets. A stable, efficient and business friendly financial system not only reduces uncertainty, cost of transactions and improves economic efficiency through efficient allocation of resources, but also brings the real sector closer to the monetary sector of the economy (Sidiqqi,2012).

An efficient and vibrant commercial banking and financial system are essential ingredients for the growth of a market economy (Kohli, 2008). The efficiency of banking system is considered to be one of the key elements of economic growth in any country. It is even more essential for economies in transition. On the one hand, low deposit rates discourage people from saving, while high loan rates do not allow potential borrowers to find necessary financial resources for their activity. So, inefficient banking system results in lack of financial resources and slow economic growth. Kenya is noted as a country with large interest rate spreads (IRS) which are associated with inefficiency generating the debate among academics, politicians and practitioners about the determinants of interest rate spread.

### **1.1.1 Operational Efficiency**

Efficiency in banking has been defined and studied in different dimensions including : scale efficiency, which refers to relationship between the level of output and the average cost; Scope efficiency, which refers to relationship between average cost and production of diversified output varieties; and Operational efficiency, a wide concept sometimes referred to as x-efficiency, which measures deviation from the cost efficient frontier that represents the maximum attainable output for the given level of inputs. With reference to various definitions, inefficiency is therefore a multifaceted concept with several meanings depending on the perspective in which it is used (Leibenstein, 1966).

Scale and scope economies for example, are achieved from the firms' output expansion resulting in an increase in the industry's output. And that reduces costs of production thus leading to the strong technological external economy. Hirshleifer and Glazer (1993) argue that scope economies occur where it is cheaper to produce varieties in a plant than in separate plants, and this is the concept from which banking consolidation stems.

Although a primary goal of deregulation is to improve efficiency, numerous studies examining the impact of financial reforms on banking performance and efficiency provide mixed results. Some studies suggest that financial reform improves efficiency. Kumbhakar and Sarkar (2003) analyzed the relationship between deregulation and performance improvement using data from the Indian banking industry over a 12-year period from 1985 to 1996. They found that the performance of private, but not public, banks improved in response to deregulation measures. Recently, Das and Ghosh (2006) used DEA to evaluate the efficiency of Indian commercial banks during the post reform period of 1992-2002. They found that medium-sized public banks performed reasonably well and efficiency improved.

Operational efficiency is the ability of management of the organizations to manage its operating costs in a more efficient manner through cost rationalization. It involves the process of allocating the available resources to viable investments. It can also be defined as what occurs when the right combination of people, process, and technology come together to enhance the productivity and value of any business operation, while driving down the cost of routine operations to a desired level (Shawki, 2008). The end result is that resources previously needed to manage operational tasks can be redirected to new, high-value initiatives that bring additional capabilities to the organization.

A commonly used ratio that bankers use to measure the overall cost effectiveness (or the operational efficiency) of an organization is the cost/income ratio (expense/income ratio or, as

often termed in the US, the efficiency ratio). This is a measure that broadly expresses the total operating costs incurred by an organization as a percentage of its operating income. The costs of keeping the bank the same would include maintenance of existing systems or operational methods that are often of no incremental value to an organization so these should be commoditized and kept as low as possible to increase efficiency. The costs of changing the bank could include costs for new products, or new delivery channels for existing ones, and these costs can be linked to the income that they generate (Kumbhakar & Lovell, 2003).

Kenyan banks are presently under intense competition to improve efficiency and transform banking service delivery into networks encompassing traditional branches, automated tellers, telephone banking and the Internet. Because no template exists to guide this transformation, they have experimented by process reengineering, closing underperforming branches and introducing new and cheaper ways of banking (Kumbhakar & Lovell, 2003).

### **1.1.2 Interest Rate Spread**

Interest rate spread is a very important subject in asset and liability management. The spread according to Rose and Hudgins (2008) measures the effectiveness of a financial firm's intermediation function in borrowing and lending money and also the intensity of competition in the firm's market. Tennant and Folawewo (2009) define IRS as the difference between the average lending rate and the average deposit rate. Interest rate spread is defined by market microstructure characteristics of the banking sector and the policy environment (Ngugi, 2001). Risk-averse banks operate with a smaller spread than risk-neutral banks since risk aversion raises the bank's optimal interest rate and reduces the amount of credit supplied. Actual spread, which incorporates the pure spread, is in addition influenced by macroeconomic variables including monetary and fiscal policy activities (Emmanuelle, 2003).

Interest rates vary depending on whether you are borrowing or lending. For example, there is a spread between the interest rate at which banks are prepared to lend (the offer rate) and the rate they are willing to pay to attract deposits (the bid rate). This spread between the offer and bid rates covers the administrative costs of the financial intermediaries and provides profit for them. The spread is itself, subject to change and likely to be smaller the greater the degree of competition among the financial institutions (Kimutai, 2003).

Pyle (1971) argues that the larger the spreads between loan and deposit rates, the more likely the necessary condition for intermediation to occur can be met. From a policy perspective, lower spreads are considered desirable. Quaden (2004) for example, argues that a more efficient banking system benefits the real economy by allowing “higher expected returns for savers with a financial surplus, and lower borrowing costs for investing in new projects that need external finance”. If the banking sector’s interest rate spread is large, it discourages potential savers due to low returns on deposit and while limiting financing for potential borrowers (Ndung’u and Ngugi, 2000).

### **1.1.3 The effect Operational Efficiency on Interest Rate Spread**

There exist many factors can have either a direct or an indirect impact on interest rates spread. Banks’ profitability and efficiency are often considered as the main factors that determine interest rates and interest rate spreads. The increase in banks’ profitability and efficiency would ensure an increase in their capital base, as well as an increase in their total activities, which would inevitably lead to a greater degree of competition in the banking system, a decrease in lending rates and a narrowing of interest rate spreads (Ikhide, 2008).

As pinned down by Campion et al (2010), perhaps the most important is the improved operational efficiency, a key driver of lower rates comes primarily from five sources:

competition, reinvestment of profits, learning by doing, pressure from donors and investors on Microfinance Institutions to be socially responsible, and the absence of interest rate caps.

There is a considerable degree of consensus that the quality of management makes the difference between sound and unsound banks. As this variable is measured by the cost/income ratio, an increase of this ratio means a deterioration of management efficiency and will result in a decrease in the net interest margin. Sarpong, Winful and Ntiamoah (2011) maintain that variations in overhead and operating costs are reflected in variations in bank interest margins as banks pass their operating costs on to depositors and lenders. Bawumia, Belnye and Ofori (2005) indicate that high operating cost, which is mainly due to labour costs, and banks' determination to maintain high profit margins are the two bank specific factors which contribute significantly to wider interest spreads.

Berger, Hunter and Timme (1993) noted that if banks are efficient, then we might expect improved profitability, greater amounts of funds intermediated, better prices and service quality for consumers, and greater safety and soundness if some of the efficiency savings are applied towards improving capital buffers that absorb risk. However, the converse applies to inefficient intermediaries, with the additional danger of taxpayer-financed industry bailouts if substantial losses are sustained. Consequently, efficiency of banks improves the overall economy which affects the welfare of the society as a whole. According to Demirguc-Kunt and Peria(2010), banking literature has often used bank spreads as indicators of banking efficiency and competition. Higher spreads and margins are often interpreted to signal greater inefficiencies and lack of competition in the banking sector.

#### **1.1.4 The Commercial Banking Sector in Kenya**

Commercial banks in Kenya are either privately-owned or public-owned institutions that accept deposits, process loans, and provides other financial services, such as international



banking and trade financing (CBK,2011).Commercial banks are licensed and regulated by the central Banks in which they operate(Charlotte,1999).In Kenya, Central Bank of Kenya (CBK) licenses, supervises and regulates all commercial banks as mandated under the Banking Act (Cap 488), Currently Kenya has 44 licensed commercial bank and one mortgage finance company. Of these 43 commercial banks, 31 are locally owned and 12 are foreign owned. The Government of Kenya has a substantial stake in three commercial banks and the remaining commercial banks are largely Family owned (Banking supervision Annual Report, 2013).

In addition, Kenyan Banks charge high or huge interest rate spreads as explained in KBA (2012) consumer report. This is because of macroeconomic instability characterized by high inflation, unstable foreign exchange rates, high cash reserve requirement and slow economic growth leading to high incidences of non-performing loans. The Central Bank of Kenya has been trying to address the issue of wide Interest Rate Spread by communication of bank charges, interest rates and lending rates for all banks as a means of promoting market discipline and competition among the players. This is done through quarterly survey on bank charges, interest rate and lending rates. The aim of this exercise is to educate the public to make informed banking decisions. However, such efforts by the Central Bank of Kenya have not been able to achieve the desired results of narrowing the IRS to international levels.

High IRS is causing high cost to borrowers and investors. On the other hand, it reduces the deposit income of the depositors. As a result, a new Central Bank of Kenya Law is in the offing to cap high interest rate. It must however be noted that previous legislative efforts to cap the high interest rates have failed, for example, the proposed amendments to the Finance bill of 2011 and Joe Donde's proposal of 2001.

## 1.2 Research Problem

Boldbaatar (2006) argued that interest rate spread remain a controversial area while some link it to market or individual banks inefficiency, others link it to external macroeconomic forces. Ng'etich (2011) argued banks which perform well manages to keep interest spread wide. Most of the studies conclude the spread is as the result of inefficiency in the banking sector. The argument in most of the studies is that large banks are more efficient than smaller and growing banks. It is expected for large banks to have a narrow spread while smaller banks to have wider spread as deduced by Boldbaatar (2006). Studies by Randall (1998), Gelbard and Leite (1999), and Brock and Rojas-Suarez (2000) all show that interest rate spreads in Sub-Saharan Africa, Latin American and the Caribbean are wider than in OECD countries. This is attributed to inefficiency in the banking sectors of developing countries. Such spreads reflects the costs of intermediation that banks incur, inclusive of their normal profits (Robinson, 2002). According to Ndung'u and Ngugi (2000), financial reforms and liberalization should improve efficiency in the intermediation process. This implies that the spread will decline over time as liberalization is accomplished and the financial sector develops. But in Kenya, financial liberalization seems to have led to a widening interest rate spread.

Studies have shown that there is a relationship between operational efficiency and interest rates spread. However, the evidence has been contrasting as the effect has not been conflicting. Findings of various studies have revealed inconsistencies regarding the relationship between operational efficiency and interest rate spread. For instance, studies on bank efficiency by Ataullah et al (2004) on India and Pakistan banks, Gilbert & Wilson (1998) on Korean banks and Hermes & Nhung (2010) on four Latin America and six Asian banks and Kumbhakar & Lozano-Vivas (2004) on Spanish savings banks, and Garr Coleman (2013) in Ghanan banks and Kimutai (2003) on US banks have documented some positive impact of bank efficiency on interest rate spread. On the other hand, studies by Wheelock and Wilson (1999) on U.S

banks, Sturm & Williams (2004) on Australian banks, Ariff & Can (2008) on Chinese bank and Oduori (2012) on Kenyan banks have reported insignificant and negative effect of operational efficiency on interest rate spread.

The interest rate spread among commercial banks in Kenya have been widening over the years. During the post-liberalization period, we expect the spread to narrow to reflect efficiency gains and reduced transaction costs with the removal of distortionary policies and strengthening of the institutional arrangements. However, Kenya's experience indicates a widening spread in the post liberalization period. In the past three year interest charged was fairly high in some banks up to 30% while interest earned by savers remains low. While interest rate charged was increasing interest rate earned remained static this resulted to a very wide spread over 20% and to some extent it meant that when interest rate increases bank are ultimate beneficiary. This provoked the members of parliament who threatened to have legislation to control interest rate. They intended to control spread to ensure banks are not ultimate beneficiary their argument was banks were exploiting its customers, on the other side banks argued Kenya is a free market and such intention would cripple banks.

Many local studies have been carried out on the operational efficiency. Nguny (2013) conducted a study on the relationship between efficiency and financial performance of commercial banks in Kenya and found a positive and significant relationship; Kinyugo (2014) did a study on the effect of cost efficiency on financial performance of companies listed on Nairobi Securities Exchange and found a weak positive relationship while Ogeto (2014) did a study on the effect of interest rates spread and management efficiency on the growth of lending among commercial banks in Kenya and found a weak negative and significant relationship. Studies carried out on interest rate include Kilongosi (2005) who did a study on net bank interest margin and interest risk among commercial banks in Kenya, Kimutai (2003) did an empirical analysis of factors contributing to high interest rates spread in Kenya and lastly

Njuguna and Ngugi (2000) did a study on banking Sector Interest Rate Spread in Kenya: Macroeconomic and Econometric Modeling, Ngugi (2001) study concluded interest rate spread impact bank financial performance his study did not involve all banks in Kenya while Were et al (2013) did a study on effect of interest rate spread on banks financial performance. None of them has ever focused on the effect of operational efficiency on interest rate spread among commercial banks in Kenya. The study therefore seeks answer to the question: What is the relationship between operational efficiency and interest rate spread among commercial banks in Kenya?

### **1.3 Objectives of the study**

The objective of the study was to investigate the effect of operational efficiency on interest rate spread among commercial banks in Kenya.

### **1.4 Value of the Study**

The study is invaluable to the management of commercial banks as they will be able to uncover the relationship that the interest rates spread have with the efficiency of their organizations. They would therefore be able to take appropriate measures to offer rates that appeal to their clients and at the same time maintain their profitability.

The results of this study would also be invaluable to researchers and scholars, as it would form a basis for further research. The students and academics would use this study as a basis for discussions on interest rates spread and firm efficiency. The study would be a source of reference material for future researchers on other related topics; it would also help other academicians who undertake the same topic in their studies.

This research will be of interest to Policy makers who, as indicated in the background, would like to see narrower spreads. Widening interest spread is an indicator of the underlying weak

institutional policy set-up of the financial sector. To this extent, policy makers will want to understand the real causes of high interest rate spreads so as to devise the most appropriate policy interventions. Policy makers would infer from the study on government initiatives for financial deepening and bank regulation. The Research will also be of interest to the Central Bank of Kenya, as the findings will assist in a more informed monetary policy.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents the literature from other scholars and researchers. It comprise of the theoretical and empirical reviews, a section on determinants of interest rate spread and finally a summary of literature review.

#### **2.2 Theoretical Review**

The study will be hinged on the market power and efficiency structure theories, loanable funds theory of real interest rates and the liquidity preference theory of interest rates.

##### **2.2.1 Market Power and Efficiency Structure Theories**

Studies on the performance of banks started in the late 1980s/early 1990s with the application of two industrial organizations models: the Market Power (MP) and Efficiency Structure (ES) theories (Athanasoglou, Brissimis & Delis, 2006). The balanced portfolio theory also added greater insight in to the study of bank profitability (Atemnkeng & Nzongang, 2006). Applied in banking the Market Power hypothesis posited that the performance of banks was influenced by the market structure of the industry. There were two distinct approaches within the MP theory; the Structure-Conduct Performance (SCP) and the Relative Market Power hypothesis (RMP). According to the SCP approach, the level of concentration in the banking market gave rise to potential market power by banks, which raised their profitability.

Banks in more concentrated markets were most likely to make abnormal profits by their ability to lower deposits rates and to charge higher loan rates as a results of collusive (explicit or tacit) or monopolistic reasons, than firms operating in less concentrated markets, irrespective of their efficiency (Tregenna, 2009). Unlike the SCP, the RMP hypothesis posited that bank

profitability was influenced by market share. It assumed that only large banks with differentiated products can influence prices and increase profits. They were able to exercise market power and earn noncompetitive profits. The ES hypothesis, on the other hand posited that banks earned high profits because they were more efficient than others. There were also two distinct approaches within the ES; the X-efficiency and Scale-efficiency hypothesis.

Based on the X-efficiency approach, more efficient firms were more profitable because of their lower costs. Such firms tended to gain larger market shares, which manifested in higher levels on market concentration, but without any causal relationship from concentration to profitability (Athanasoglou, Brissimis & Delis, 2006). The scale approach emphasized economies of scale rather than differences in management or production technology. Larger firms could obtain lower unit cost and higher profits through economies of scale. This enabled large firms to acquire market shares, which manifested in higher concentration and then profitability.

Athanasoglou et al (2006) argued that profitability was a function of internal factors that are mainly influenced by a bank's management decisions and policy objectives such as the level of liquidity, provisioning policy, capital adequacy, expense management and bank size, and the external factors related to industrial structural factors such as ownership, market concentration and stock market development and other macroeconomic factors. The above theoretical analysis showed that MP theory assumed bank profitability was a function of external market factors, while the ES and Portfolio theory largely assumed that bank performance was influenced by internal efficiencies and managerial decisions (Olweny & Shipho, 2011).

### **2.2.2 Loanable Funds Theory of Real Interest Rates**

This theory was postulated by Mishkin (2010). The term loanable funds simply refer to the sums of money offered for lending and demanded by consumers and investors during a given period. The interest rate in the model is determined by the interaction between potential

borrowers and potential savers. According to the loanable funds theory, economic agents seek to make the best use of the resources available to them over their lifetimes. One way of increasing future real income might be to borrow funds now in order to take advantage of investment opportunities in the economy. This would work only if the rate of return available from investment were greater than the cost of borrowing. Thus borrowers should not be willing to pay a higher real rate of interest than the real rate of return available on capital. In a perfect market, this is equal to the marginal productivity of capital – the addition to output that results from one unit addition to capital, on the assumption that nothing else changes. This is influenced by factors such as the rate of invention and innovation of new products and processes, improvements in the quality of the workforce and the ability to reorganize the economy to make better use of scarce resources. Savers on the other hand are able to increase their future consumption levels by foregoing some consumption in the present and lending funds to investors. We start by assuming that consumers would, other things being equal, prefer to consume all their income in the present. They are prepared to save and lend only if there is a promise of a real return on their savings that will allow them to consume more in future than they would otherwise be able to do. The real rate of return lenders demand thus depends on how much they feel they lose by postponing part of their consumption. Thus, the rate of return is the reward for waiting, that is, for being willing to delay some of the satisfaction to be obtained from consumption. The extent to which people are willing to postpone consumption depends upon their time preference (Saunders & Cornet, 2011).

Unsurprisingly, the loanable funds theory has some problems. Firstly it is clear that people go on saving even when real interest rates become negative and remain so for quite long periods. This can occur through the existence of money illusion i.e. confusion between real and nominal values causing people not to take inflation fully into account. It happens only in the short – run (when the system is in disequilibrium). This means however, that the model does not do very



well in explaining changes in interest rates over what economists refer to as the short-run, but this can involve quite long periods of actual time. Secondly, real as well as nominal interest rates are capable of changing rapidly. We can see that the concentration on the long run in the loanable funds approach to interest rates seriously understates the role of monetary authorities in a modern economy. Thirdly, there is another problem stemming from the assumption that the rate of inflation or expected rate of inflation has no long-run impact on the real rate of interest. Unfortunately for the theory, there is no doubt that inflationary expectations do influence the willingness of people to save and of potential investors to borrow (Howels, 2007).

The loanable funds theory can be modified to take such complaints into account. The problem is that these changes are ad hoc and run the risk of destroying the central idea at the heart of the loanable funds – that the market economy is stable and has a strong in-built tendency to return to equilibrium. The real rate of interest is a key variable in the explanation of how this might happen. It therefore makes sense to look at a different theory of interest rates- one that is constructed on entirely different assumptions as to how the economy works (Mishkin, 2010).

### **2.2.3 The Liquidity Preference Theory of Interest Rates**

According to the theory by Cihak and Podpiera (2005), investors will always prefer short-term securities to long-term securities. In an uncertain world, then, saving and investment may be much more influenced by expectations and by exogenous shocks than by underlying real forces. One possible response of risk-averse savers is to vary the form in which they hold their financial wealth depending on what they think is likely to happen to assets prices- they are likely to vary the average liquidity of their portfolios. In periods in which people are confident that assets prices will increase, they are encouraged to hold a high proportion of their portfolios in liquid assets, benefiting from the higher rates of interest that they offer. Increased doubts

about future assets prices, on the other hand encourages people to give up these higher rates of interest in search of greater security offered by more liquid assets. This happens in financial markets all the time. Again bonds with distant maturity dates carry more capital risk than those near to maturity and are thus relatively less attractive when the markets turn from the equity and bond markets and hold instead, short-term securities and cash during periods of uncertainty (Howels, 2007).

Here we see a quite different role for interest rates than that played in the loanable funds theory. Plainly, an expectation of an increase in interest rates increases the prospect of a fall in financial assets prices generally and for a greater relative fall in the prices of illiquid assets. In other words, an expected increase in interest rates, *ceteris paribus*, increases the preference of asset holders for liquidity. This general idea was developed into an economic theory by Keynes within a simplified model in which there were only two types of financial assets – money, the liquid asset, and bonds with no maturity date (consoles), the illiquid asset. An increased preference for liquidity in this model is equivalent to an increased demand for money. Thus the demand for money increases whenever people think interest rates are likely to rise than they believe they are likely to fall. This is Keynes' speculative motive for holding money instead of less liquid assets in order to avoid a capital loss (Mishkin, 2010).

There is very little objection to this negative relationship between interest rates and the demand for money since there are other possible explanations for it. Investors must be offered a liquidity premium to buy longer-term securities that have higher risk of capital losses. This difference in price or liquidity can be directly related to the fact that longer-term securities are more sensitive to interest –rate changes in the market than short-term securities. Because the longer the maturity on security, the greater its risk, the liquidity premium increases as maturity increases. The liquidity premium theory states that long-term rates are equal to the geometric average of the current and expected short-term rates plus a liquidity or risk premium that

increases with the maturity of the security. For example, according to the liquidity premium theory, an upward-sloping yield curve may reflect the investors' expectations that future short-term rates will rise, be flat, or fall, but because the liquidity premium increases with maturity, the yield curve will nevertheless increase with the term to maturity (Crouhy, 2005).

### **2.3 Determinants of Interest Rate Spread**

The existing literature suggests that the main factors that determine differences in interest rate spreads for banks and its changes over the time are bank-specific characteristics (total assets, equity to assets ratio, liquidity level, market share), level of concentration in the system, entry regulations, restrictions on bank activities, institutional framework (Demirgüç-Kunt, Laeven and Levine, 2004).

#### **2.3.1 Operational Efficiency**

Since banks are profit-seeking entities, it is entirely logical that the burden of operational costs will be shared with bank customers. Ndung'u and Ngugi (2000) note that 'it has been observed that large spreads occur in developing countries due to high operating costs, financial taxation or repression and lack of a competitive financial/banking sector among other factors'.

The efficiency of banks can be assessed through indicators of financial soundness. Changes in those indicators are noticeable for Sub Saharan Africa since the banking reforms of the 1990s. For instance, total problem loans as percent of assets decreased by 0.9 percent after the restructuring; they equaled 8.3 percent in 2003. SSA banks increased their capital as share of assets to 18.9 percent the same year against 14.5 percent during the 1990s. Hauner and Peiris (2005) investigated whether the banking sector reforms undertaken in Uganda to improve competition and efficiency have been effective. Cihak and Podpiera (2005), studying East African banking reforms, found that the banking systems of Kenya, Tanzania, and Uganda

were inefficient and had only a limited intermediation role, despite recent reforms and even with international banks present.

### **2.3.2 Market Structure and Size**

Internal organization and management, including government ownership and control and the regulatory framework, define market structure. For example, a repressive financial system is characterized by credit ceilings that impose uneven credit-rationing criteria and reduce efficiency in resource allocation. In addition, a repressed financial system has interest rate ceilings that create a disincentive for resource mobilization as investors are poorly rewarded, while banks have no incentive to compete for deposits as extra deposits represent idle cash reserves (Chirwa and Mlachila, 2004).

Consequently, deposit supply and demand is sub-optimal. In addition, the presence of government owned and controlled banks and a weak legal system make it difficult to enforce the regulatory system. Thus, the market structure incorporates the degree of competition, concentration and interlocking control between financial institutions and business enterprises and the degree of specialization (Fry, 1995).

### **2.3.3 Inflation**

There is a field of extensive studies on the test of the positive relationship between the expected inflation rate and interest rate spreads. This variable is an indicator of the cost of doing business in an economy, and it is expected to be positively correlated with Interest Rate spreads, particularly in developing countries where inflation is high and variable (Chirwa and Mlachila, 2004). Hakan et al, (2004) analyzed the effect of different types of inflation uncertainty on a set of interest rate spreads for the UK economy. According to this study, where three types of inflation uncertainty i.e., structural uncertainty, impulse uncertainty, and steady-state inflation uncertainty are defined and derived using a time varying parameter model, the findings were

that both structural and steady-state inflation uncertainties increase interest rate spreads, while empirical evidence for the impulse uncertainty is not conclusive.

Oduori (2012) in a study on the determinants of interest rate spreads amongst commercial banks in Kenya indicate that over the last five years, the Central Bank Rate and the Credit Loss Ratio have been the most significant determinants of interest rate spreads amongst commercial banks in Kenya. The Treasury Bill Rate and Market Structure have also contributed to banking sector spreads. The results however also clearly indicate that many of the factors commonly believed to be critical determinants of interest rate spreads may not in fact have been relevant to the size of the banking sector spreads over the last 5 years. Possibly most surprising was the statistical insignificance of the inflation, interbank rate and cost to income ratios. Although these variables have been highlighted in previous studies as determinants of interest rate spreads they were unable to explain the variation in banking sector spreads in Kenya for the period studied. This may be due to the relatively short period (5 years), which is insufficient to draw inferences over the long run. The results therefore do not suggest that inflation, interbank rate and cost to income ratio are not determinants of the size of spreads, but rather indicate the need for the further studies on these variables, taking a longer period into account.

#### **2.3.4 Discount Rates**

This is the cost faced by commercial banks when borrowing from central banks. Although declining in popularity, the discount rate is still used in Kenya as a monetary policy instrument and the Central Bank of Kenya has indeed indicated this as one of the three tools used to enforce monetary policy. An extract from the CBK Website reflects this understanding... “The Bank, as lender of last resort, may provide secured short-term loans to commercial banks on overnight basis at punitive rates, thus restricting banks to seek funding in the market resorting to Central

Bank funds only as a last solution. The discount rate is set by the Central Bank to reflect the monetary policy objectives” (Chirwa and Mlachila, 2004).

Tennant and Folawewo (2007) findings is that whether or not the discount rate is still being used by the government as a means of controlling the money supply, it is undoubtedly an important factor in determining the size of the banking sector interest rate spreads. Governments and central banks should therefore carefully consider the level at which they set their discount rates as it has significant feedback impacts on economic variables through the interest rate spreads.

### **2.3.5 Treasury Bill Rates**

This is generally regarded as an indicator of the interest rate policy being pursued by the government, and a benchmark for the rates charged by commercial banks. This variable is therefore also expected to be positively correlated with Interest Rate Spreads, because lower Treasury bill rates would lead to lower interest rate spreads and vice versa (Garr and Coleman, 2013). According to Ngugi (2004), Treasury Bill Rate reduces the interest margin as it serves as a diversifying asset for the banks. Other studies have however found Treasury bill rates to be an insignificant determinant of interest rate spreads (Tennant and Folawewo, 2007) or only significant in the short-run (Kimutai, 2003).

Claeys and Vennet (2004) and Idrees (2007) have explored various determinants of interest rate spreads. These determinants can be classified as macroeconomic (examples include inflation, and government borrowing proxied by the Treasury bill rate), market (such as interbank rate and discount rate) and bank-specific (including administrative costs, nonperforming loans, non-interest income, liquidity ratio, market share of banks and return on assets,) have been of significant importance.

## **2.4 Empirical Studies**

According to Ndung'u and Ngugi (2000), financial reforms and liberalization should improve efficiency in the intermediation process. This implies that the spread will decline over time as liberalization is accomplished and the financial sector develops. But in Kenya, financial liberalization seems to have led to a widening interest rate spread. The main factors that appear to propel this are distortions in the loans market, institutional impediments and the policy environment. Ndung'u and Ngugi (2000) presented empirical support for these views and argued that disequilibrium in the loans market is a major factor in driving the spread and has substantial feedback effects, which reflect persistence of the disequilibrium. They also concluded that institutional and policy factors impact on transactional costs and compound the effects of risks and uncertainty in the market, thus exacerbating the spread.

Kimutai (2003) sought to identify the factors that contribute to high interest spreads in Kenya and also to quantify the impact of these factors on interest rate spreads. Monthly data on the change in overall consumer price index (inflation), nominal treasury bill rate, inter-bank rate, the ratio of operating costs to total income, unremunerated required reserves of banks, default risk (measured by the non-performing loans to total loans ratio) and the Herfindahl - Hirschman index (HHI) for banks were used as explanatory or independent variables. A multivariate interest rate spread model was formulated to test the significance of each of the independent variables as determinants of banks' spread. The monthly average data of the variables were regressed against the percentage of interest rate spread per month as the dependent variable. The study covered the period 1993:1 to 2002:12 when the banks' interest rate spread was the highest in Kenya. Secondary data was obtained from various published sources and analyzed by use of multiple regression modeling. The Pcgive Statistical Package was used. The results of the study indicate that the Treasury Bill Rate, Operating Cost to Total Income Ratio, Unremunerated Required Reserves, Default Risk and Herfindahl-Hirschman Index are key

variables determining banks' interest rate spread in Kenya. An increase in Operational Expenses to Total Income Ratio leads to an increase in the banks' interest rate spread. Increase in Unremunerated Required Reserves has similar effect in banks' interest rate spread. Similarly, increases in the Default Risk, measured by the Non-Performing loans to Total Loans Ratio, lead to increase in banks' interest rate spread. The Herfindahl - Hirschman index, measures the level of competition in the banking sector. According to the study, an increase (decrease) in the Herfindahl - Hirschman index results in an increase (decrease) in the interest rate spread. The results also show that the Treasury bill rate and the inflation rate variables, which were insignificant in the long run, were however significant in the short run but with different signs. Ngugi (2004) analyzed the interest spread in Kenya from 1970 to 1999 and found out that interest rate spreads increased because of yet- to-be gained efficiency and high intermediation costs. Increase in spread in the post-liberalization period was attributed to the failure to meet the pre-requisites for successful financial reforms, the lag in adopting indirect monetary policy tools, and reforming the legal system and banks' efforts to maintain threatened profit margins from increasing credit risk as measured by non-performing loans to total advances.

Boldbaatar (2006) carried out a study to examine commercial banks' interest rate spreads between lending and deposit rates. The study intended to examine factors that affect interest rate spread in SEACEN countries banks. The study sampled 40 banks from 6 different countries covering the period from 4th quarter of 1998 until 4th quarter of 2004. Data was obtained from financial statements which were distributed to member central bank. The study revealed that banks' spreads are influenced by bank specifics, market forces and the regulatory environment. The findings of the study indicate that the factors that increase the spread in the selected SEACEN countries include market concentration and credit risks. However, bigger banks tend to operate with lower spreads due to better managerial efficiency. Reserve requirements are also costly for customers but statutory reserve remuneration appears to mitigate this burden



effectively, at least in some countries. Consolidation through mergers and acquisitions can give banks the market power to operate with higher spreads, contributing to long term stability and profitability of banks.

Nawaz, Hudon & Basharat (2008) provides first empirical evidence of the role of efficiency in microfinance in the determination of interest rate charged to the clients. Using the data of 291 MFIs in 67 countries worldwide, the results confirm that after controlling for loan size and gender, social efficiency has insignificant impact on interest rate which depicts the fact that as outreach increases, it causes the lending interest to rise. On the other hand, financial efficiency of MFIs has significant positive relation with interest rate even after controlling for outreach, gender and ROA.

Aboagyeet *al.*,(2008) studies the response of net interest margin of banks to changes in factors that are bank-specific, banking industry specific and Ghanaian economy macroeconomic factors. It finds that an increase in the following factors increases the net interest margin of banks: bank market power (or concentration), bank size, staff costs, administrative costs, extent to which a bank is risk averse and inflation. On the other hand, an increase in excess reserves of banks, central bank lending rate and management efficiency decreases the net interest margin of banks.

Matheri (2009) undertook an econometric analysis of macroeconomic and industry specific factors that influence behavior of ex-post interest rate spread of thirty commercial banks in Kenya. The variables in the model namely exchange rate risk, treasury bill rate, statutory reserve requirements, public sector share of credit, liquidity ratio, operating inefficiency, market power, credit risks and quality of loans are not exhaustive of the market and macro-economic determinants of interest rate spreads.

Simiyu (2009) did a study on the effect of financial liberalization on the X-efficiency of commercial banks in Kenya. The study hypothesized that there exists a positive relationship between liberalization and X-efficiency of commercial banks in Kenya. The study used secondary data that was obtained from the audited financial statements of the commercial banks as well as the Banks' Supervision Department of the Central Bank of Kenya (CBK). The sample period was 1986 to 2007. The analysis was based on stochastic cost frontier analysis approach. The key findings of the study are as follows: First, after financial liberalization, commercial banks had put in place cost intensive measures to enhance their outputs (profits) through strategic developments, branch expansion, growth of capital base, and measures to encounter competitive rivalry. Secondly, the three periods' cross-sectional estimates of X-efficiency for big banks were lower than for small banks, suggesting that big banks as a group were more efficient than small banks. Thirdly, the findings based on the Pearson's correlation coefficient measure of persistence indicated that a significant linear relationship existed between X-efficiency and Financial Liberalization. Finally, the findings indicated that the average cost efficiency estimates were significantly different between the post-financial liberalization period and the pre- and during liberalization. In conclusion, financial liberalization in Kenya led to a decline in cost efficiency across the sampled banks.

Garr and Coleman (2013) did a study on macroeconomic and industry determinants of interest rate spread-empirical evidence. This paper examined bank-specific, industry-specific and macroeconomic factors that influence interest rate spreads (IRS) in commercial banks in Ghana using unbalanced panel data set from 33 commercial banks covering the 21-year period 1990 to 2010. The study employed annual time series data from 1990 to 2010. Results suggest that interest rate spread in Ghana is significantly influenced by bank-specific and macroeconomic variables. These are bank ownership, Management inefficiency, Gross Domestic Product Per Capita (GDPPC) and Government Securities which all have positive relationship with IRS.

Government borrowing on the other hand also influences IRS significantly but has a negative effect.

Were and Wambua (2013) carried study to establish determinants of interest rate spread of Kenya commercial banks. Study intended to investigate the determinants of interest rate spreads in Kenya's banking sector. Study collected data from all 44 commercial banks. The empirical results showed that bank-specific factors play a significant role in the determination of interest rate spreads. These include bank size based on bank assets, operational efficiency, credit risk as measured by non-performing loans to total loans ratio, liquidity risk, return on average assets and operating costs. The impact of macroeconomic factors such as real economic growth and inflation is not significant. Similarly, the impact of policy rate as an indicator of monetary policy is found to be positive but weak. On average, big banks have higher spreads compared to small banks.

Mimi (2013) conducted a study on the relationship between interest rate spread and its determinants in commercial banks in Kenya. This was a descriptive study which was applied to a population of 43 commercial banks. Secondary data was collected from commercial banks' audited annual financial reports on bank size, credit risk, operating costs, liquidity risk and return on assets. The data was analyzed using multiple linear regression analysis. The study found that bank size had a negative effect on interest rate spread, though insignificant. Correlation analysis shows that there was negative overall linear relationship between bank size and interest rate spread. The study concluded that bank-specific factors (credit risk, liquidity risk, return on assets and operating costs) significantly influenced interest rate spread. The interest rate spread was sensitive to GDP and inflationary pressures. It is recommended that CBK should apply stringent regulations on interest rates charged by banks to make them more receptive to monetary policies. Information asymmetry to be reduced to lower banking

risk, thus result in lower spread. The study recommends that further studies be done on the effect of interest rate spread on loan delinquency and performance of commercial banks.

## **2.5 Summary of Literature Review**

The concept of operational efficiency derives its basis in the neo-classical theory of the firm and assumes profit maximizing behavior. Efficiency, as a key factor of competitiveness, nowadays receives a multidimensional interest justified by the coexistence of well-defined capacities and skills making up a neither entangled and inter-related set which we cannot minimize nor neglect the value of one over the other.

The chapter reviewed literature on the relationship between the operational efficiency of commercial banks and the interest rate spread. The literature indicates that there are conflicting views offered by different studies and there is less on Kenyan perspective. For instance, studies on bank efficiency by Ataullah et al (2004) on India and Pakistan banks, Gilbert & Wilson (1998) on Korean banks and Hermes & Nhung (2010) on four Latin America and six Asian banks and Kumbhakar & Lozano-Vivas (2004) on Spanish savings banks, and Garr Coleman (2013) in Ghanaian banks and Kimutai (2003) on US banks have documented some positive impact of bank efficiency on interest rate spread. On the other hand, studies by Wheelock and Wilson (1999) on U.S banks, Sturm & Williams (2004) on Australian banks, Ariff & Can (2008) on Chinese bank and Oduori (2012) on Kenyan banks have reported insignificant and negative effect of operational efficiency on interest rate spread. Most of these studies are done in other countries whose strategic approach and financial footing is different from that of Kenya. Most of them also focus on both the microeconomic and macroeconomic variables affecting interest rate spread. There is therefore a literature gap on the relationship between operational efficiency of commercial banks and interest rate spread in developing countries.

This study therefore seeks to fill this gap by focusing on the relationship between operational efficiency and interest rate spread among commercial banks in Kenya.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter includes the various stages that were followed to complete the study. The chapter therefore comprised of the following subsections: research design, target population, data collection procedures and data analysis.

#### **3.2 Research Design**

Research design is the scheme, outline or plan that was used to generate answers to research problems (Orodho, 2003). This study adopted the descriptive research design based on the key areas of interest. According to Mugenda and Mugenda (2003), descriptive research design will help the researcher to clearly identify and describe true characteristics of a research problem without manipulation of research variables. According to Polit and Beck (2003), in a descriptive study, researchers observe, count, delineate, and classify. They further describe descriptive research studies as studies that have, as their main objective, the accurate portrayal of the characteristics of persons, situations, or groups, and/or the frequency with which certain phenomena occur.

#### **3.3 Target Population**

Target population is the specific population about which information is desired (Ngechu, 2004). The population of interest in this study comprised of the 43 commercial banks operating in Kenya as at December 2014. The study took a census approach since the population is not large to necessitate sampling.

#### **3.4 Data Collection**

In this study emphasis was given to secondary data which will be obtained from the financial results filed at Central Bank of Kenya, Central Bureau of Statistics and Annual Banking

Survey reports. The data included the actual financial statements data covering the period between 2009 and 2014.

### **3.5 Data Analysis and Presentation**

The study used both descriptive and inferential statistics in analyzing the data. Analysis was done with the help of Statistical package for social sciences (SPSS version 21). First, data collected was cleaned, sorted and collated. Descriptive statistics such as mean score, frequencies and percentages for each variable was calculated and tabulated using frequency distribution tables and graphs.

#### **3.5.1 Research Analytical Model**

In order to test the relationship between the variables the inferential tests including the regression analysis was used. Regression analysis was therefore used to determine the relationship between operational efficiency and interest rate spread. The size of the bank was taken as the control variable. According to Zarruk (1989) size affects the operational efficiency of banks. In this study size of the banks was defined by the Log of Total asset.

The regression equation was:

$$\text{IRS} = \beta_0 + \beta_1 \text{OE} + \beta_2 \text{Size} + \beta_3 \text{Inf} + \beta_4 \text{DR} + \beta_5 \text{TBR} + e$$

**Where,**

**IRS** is interest rate spread – The dependent variable

**$\beta_0$**  is a Constant (coefficient of y- intercept),

**$\beta_1, \beta_2, \beta_3, \beta_4$  and  $\beta_5$**  are Coefficients of determinations

Independent variables-

**OE** is Operational Efficiency

**Size** is the size of the bank (log of total asset)

**Inf** is the Inflation rate

**DR** is Discount Rates

**TBR** is Treasury bill Rates

“e” is the stochastic disturbance error term.

### **3.5.2 Test of Significance**

The coefficient of determination ( $R^2$ ) was used to measure the extent to which the variation in interest rate spread is explained by the variations in operational efficiency. F-statistic was also computed at 95% confidence level to test whether there is any significant relationship between interest rate spread and operational efficiency. This analysis will be done using SPSS software and the findings presented in form of a research report.

### **3.5.3 Measuring the Interest Rate Spread**

In this study interest rate spread was captured by combining the accounting and optimal firm behavior models. The accounting value of net interest margin uses the income statement of commercial banks, defining the bank interest rate margin as the difference between the banks' interest income and interest expenses, which is expressed as a percentage of average earning assets (Barajas, Steiner and Salazar, 1996). The firm maximization behaviour, on the other hand, allows derivation of profit maximization rule for interest rate and captures features of market structure. Depending on the market structure and risk management, the banking firm is assumed to maximize either the expected utility of profits or the expected profits. Interest rate spread will be measured using the following narrow definition:

$SPN2 = (\text{interest plus commission received/loans}) - (\text{interest plus commission paid/deposits})$ .

### **3.5.4 Measuring of operational efficiency**

Operational efficiency = operating costs/total operating income



## **CHAPTER FOUR**

### **DATA ANALYSIS, RESULTS AND DISCUSSION**

#### **4.1 Introduction**

This chapter presents the information processed from the data collected during the study on the effect of operational efficiency on interest rate spread among commercial banks in Kenya. The sample composed of all the 43 commercial banks operating in Kenya as at December 2014.

#### **4.2 Descriptive statistics**

Descriptive statistics are the measures that define the general nature of the data under study. They define the nature of response from primary data and/or secondary data. Descriptive statistics for this study were: mean, standard deviation, minimum and maximum. Descriptive data analysis was performed on the interest rate spread, operational efficiency, inflation rate, size of the bank, discount rates, and Treasury bill rates. The descriptive statistics results are tabulated below

#### **4.2 Descriptive statistics of the Population**

This summarizes the population characteristics between operational efficiency and interest rate spread. The results of tests on the differences in means of all variables were considered i.e. Interest rates spread, operational efficiency, Inflation rate, Bank size, Treasury bills rate and Discount Rates. Their means, medians, minimum, maximum, skewness, standard deviation and kurtosis were considered. The findings are indicated in table 4.1 below

**Table 4. 1: Descriptive Statistics.**

	<b>Interest spread rates</b>	<b>Operational efficiency</b>	<b>Inflation rate</b>	<b>Bank size</b>	<b>Treasury bills rate</b>	<b>Discount Rates</b>
<b>Mean</b>	.0945	.7537	0.9098	.1564	.07321	.12356
<b>Median</b>	.0873	.6736	.1491	.1372	.07326	.12146
<b>Maximum</b>	.2088	2.2718	.1972	.4078	.23401	0.1910
<b>Minimum</b>	.03213	.2509	.0016	.0796	.0409	0.0366
<b>Std. Deviation</b>	.0354	.3811	.0384	.0699	.2051	.1732
<b>Skewness</b>	1.171	2.271	1.785	1.761	.994	4.139
<b>Kurtosis</b>	1.694	7.107	3.502	3.635	1.910	22.454
<b>Observations</b>	215	215	215	215	215	215

**Source: Research Findings**

The results in table 4.1 showed the tests in differences in means of all variables, i.e. interest rates spread showed the an average percentage mean of 9.45 with a standard deviation of 0.354, operational efficiency showed a mean of 75.37 with a standard deviation of 0.381, Inflation rate showed a mean of 3.88 with a standard deviation of 0.038, Bank size showed a mean of 15.64 with a standard deviation of 0.069, treasury bills rate showed a mean of 7.321 with a standard deviation of 0.2051 and discount Rates showed a mean of 12.4 with a standard deviation of .1732. The positive values implies that all variables under the model are significant

in determining the interest spread among commercial banks in Kenya. The kurtosis values indicate that the variables are not normally distributed.

### 4.3 Inferential Statistics

#### 4.3.1 Correlation Analysis

To quantify the strength of the relationship between the variables, the study used Karl Pearson's coefficient of correlation. The Pearson product-moment correlation coefficient (or Pearson correlation coefficient) is a measure of the strength of a linear association between two variables and is denoted by  $r$ . The Pearson correlation coefficient,  $r$ , can take a range of values from +1 to -1. A value of 0 indicates that there is no association between the two variables. A value greater than 0 indicates a positive association, that is, as the value of one variable increases so does the value of the other variable. A value less than 0 indicate a negative association. The findings are presented as follows;

**Table 4. 2: Correlation Analysis**

	Interest Rate Spread	Operational Efficiency	Inflation rate	Size of the bank	Discount Rates	Treasury bill Rates
Interest Rate Spread	1					
Operational Efficiency	.601**	1				
Inflation rate	.163**	.124	1			
Size of the bank	.030**	.361**	.001	1		
Discount Rates	.146**	.661	.321	.621	1	
Treasury bill Rates	.234**	.361	.436	.736	.414	1

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

Results in table 4.2 above reveal that the correlation between interest rate spread and operational efficiency is positive and significant ( $R=0.601$ ,  $p$  value= $0.005$ ). This implies that an increase in operational efficiency is associated with an increase in interest rate spread and a decrease in operational efficiency is associated with a decline in interest rate spread. Findings reveal that the correlation between interest rate spread and inflation rate is positive and significant ( $R=0.163$ ,  $p$  value= $.0012$ ). This implies that an increase in inflation rate is associated with an increase in interest rate spread and a decrease in inflation rate is associated with a decline in interest rate spread. In addition, the study reveals that the correlation between interest rate spread and size of the bank is positive and significant ( $R=0.030$ ,  $p$  value= $.0091$ ). This implies that an increase in size of the bank is associated with an increase in interest rate spread and a decrease in size of the bank is associated with a decline in interest rate spread. Further, the study reveals that the correlation between interest rate spread and discount rates is positive and significant ( $R=0.146$ ,  $p$  value= $.0012$ ). This implies that an increase in discount rates is associated with an increase in interest rate spread and a decrease in discount rates is associated with a decline in interest rate spread. Finally the study establishes that the correlation between interest rate spread and Treasury bill rates is positive and significant ( $R=0.234$ ,  $p$  value= $0.0041$ ). This implies that an increase in Treasury bill rates is associated with an increase in interest rate spread and a decrease in Treasury bill rates is associated with a decline in interest rate spread.

The study further applied general Linear Model to determine the effect of operational efficiency on interest rate spread among commercial banks in Kenya. This included regression analysis, the Model, Analysis of Variance and coefficient of determination.

In addition, the researcher conducted a multiple regression analysis so as to test the relationship between operational efficiency and interest rate spread.

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (interest rate spread) that is explained by all the five independent variables i.e. (operational efficiency, inflation rate, size of the bank, discount rates, and treasury bill rates).

#### 4.3.2 Regression Analysis

The study conducted a cross-sectional multiple regressions on the effect of operational efficiency on interest rate spread among commercial banks in Kenya over a period of five years (2010-2014). Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (Interest Rate Spread) that is explained by all the five independent variables (operational efficiency, inflation rate, size of the bank, discount rates and treasury bill rates).

**Table 4. 3: Results of multiple regression between Interest Rate Spread, and predictor variables**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.822	0.807	0.791	0.116	1.985

Variations in five independent variables that were studied, explain 80.7% on the variation on interest rate spreads ( $R^2=0.807$ ). Autocorrelation as measured by Durbin Watson Statistic was 1.985 which is between 0 and 2. This shows a positive autocorrelation between the variables.

**Table 4. 4: ANOVA of the Regression**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.534	5	1.267	8.635	.000 <sup>a</sup>
	Residual	9.307	37	2.327		
	Total	11.841	42			

The significance value is 0.000 which is less than 0.05 thus the model is statistically significant in predicting how (operational efficiency, inflation rate, size of the bank, discount rates, and Treasury bill rates) affect interest rate spreads. The F critical at 5% level of significance was 2.25. Since F calculated is greater than the F critical (value = 8.635), this shows that the overall model was significant.

**Table 4. 5: Coefficient of Correlation**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.103	0.2235		5.132	0.000
	Operational Efficiency	0.852	0.1032	0.1032	6.569	.001
	Inflation rate	0.654	0.3425	0.1425	4.117	.004
	size of the bank	0.231	0.2178	0.1178	3.968	.002
	Discount Rates Rates	0.489	0.1243	0.1234	4.018	.001
	Treasury bill Rates	0.578	0.1146	0.1342	3.647	.003

**Source: Author (2015)**

Multiple regression analysis was conducted as to determine the relationship between the interest rate spread and the five variables.

$$(Y= 1.103+ 0.852OE+ 0.231Size + 0.654 Inf + 0.489 DR + 0.578TBR)$$

According to the regression equation established, taking all factors into account (operational efficiency, inflation rate, size of the bank, discount rates, and treasury bill rates) constant at zero, interest rate spread will be 1.103. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in operational efficiency will lead to a 0.852 increase in interest rate spread.

#### **4.3.3 Multicollinearity Test**

A situation in which there is a high degree of association between independent variables is said to be a problem of multicollinearity. Multicollinearity can also be solved by deleting one of the highly correlated variables. Heteroscedasticity means that previous error terms are influencing other error terms and this violates the statistical assumption that the error terms have a constant variance.

**Table 4. 6: Summary of Collinearity Statistics**

<b>Model</b>		<b>Collinearity Statistics</b>	
		<b>Tolerance</b>	<b>VIF</b>
1	Operational Efficiency	.937	1.068
	Inflation rate	.873	1.145
	Size of the bank	.796	1.218
	Discount Rates	.864	1.157
	Treasury bill Rates	.910	1.099

The Variance inflation factor (VIF) was checked in all the analysis and it ranged from above 1 to 4 which is not a cause of concern according to Myers (1990) who indicated that a VIF greater than 10 is a cause of concern. The basic assumption is that the error terms for different observations are uncorrelated (lack of autocorrelation).

#### **4.3.4 Normality test**

Normality of the variables was examined using the skewness and kurtosis. According to Kline (2011) the univariate normality of variables can be assumed if the skewness statistic is within the interval (-3.0, 3.0) and the kurtosis statistic lying in the interval (-10.0, 10.0).



**Table 4. 7: Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Operational Efficiency	2.203	42	.017	1.914	42	.005
Inflation rate	3.045	42	.032	1.632	42	.032
Size of the bank	2.943	42	.041	1.231	42	.021
Discount Rates	2.153	42	0.03	1.532	42	.019
Treasury bill Rates	2.270	42	.004	1.839	42	.012

From the finding on the Kolmogorov-Smirnov and Shapiro-Wilk test on normality, the study found that significance in both test were less than 0.05 which leads to the rejection of the null hypothesis that that data on operational efficiency, inflation rate, size of the bank, discount rates and treasury bill rates were not normally distributed this is an indication that data on the variables were normally distributed.

From the regression analysis, operational efficiency positively and significantly influenced the interest rate spread among commercial banks in Kenya (B= 0.852, t= 6.569, p=.001). These findings are in line with Ndung'u and Ngugi (2000) who note that 'it has been observed that large spreads occur in developing countries due to high operating costs, financial taxation or repression and lack of a competitive financial/banking sector among other factors'.

A unit increase in inflation rate will lead to a 0.654 increase in interest rate spread. Inflation rate positively and significantly influenced the interest rate spread among commercial banks in Kenya (B= 0.654, t= 4.117, p=.004). These findings are similar to Oduori (2012) findings in a

study on the determinants of interest rate spreads amongst commercial banks in Kenya who indicated that over the last five years, the Central Bank Rate and the Credit Loss Ratio have been the most significant determinants of interest rate spreads amongst commercial banks in Kenya. The Treasury Bill Rate and Market Structure have also contributed to banking sector spreads. The results however also clearly indicate that many of the factors commonly believed to be critical determinants of interest rate spreads may not in fact have been relevant to the size of the banking sector spreads over the last 5 years.

A unit increase in size of the bank will lead to a 0.231 increase in interest rate spread. Size of the bank positively and significantly influenced the interest rate spread among commercial banks in Kenya ( $B= 0.231$ ,  $t= 3.968$ ,  $p=.002$ ). Internal organization and management, including government ownership and control and the regulatory framework, define market structure. For example, a repressive financial system is characterized by credit ceilings that impose uneven credit-rationing criteria and reduce efficiency in resource allocation. In addition, a repressed financial system has interest rate ceilings that create a disincentive for resource mobilization as investors are poorly rewarded, while banks have no incentive to compete for deposits as extra deposits represent idle cash reserves (Chirwa and Mlachila, 2004).

A unit increase in discount rates will lead to a 0.489 increase in interest rate spread. Discount rates of the bank positively and significantly influenced the interest rate spread among commercial banks in Kenya ( $B= 0.489$ ,  $t= 4.018$ ,  $p=.001$ ). Similarly, Tennant and Folawewo (2007) findings is that whether or not the discount rate is still being used by the government as a means of controlling the money supply, it is undoubtedly an important factor in determining the size of the banking sector interest rate spreads. Governments and central banks should therefore carefully consider the level at which they set their discount rates as it has significant feedback impacts on economic variables through the interest rate spreads.

A unit increase in Treasury bill rates will lead to a 0.578 increase in interest rate spread. Treasury bill rates positively and significantly influenced the interest rate spread among commercial banks in Kenya ( $B= 0.578$ ,  $t= 3.647$ ,  $p=.003$ ). The findings are in line with Kimutai (2003) who sought to identify the factors that contribute to high interest spreads in Kenya and also to quantify the impact of these factors on interest rate spreads. Monthly data on the change in overall consumer price index (inflation), nominal treasury bill rate, inter-bank rate, the ratio of operating costs to total income, unremunerated required reserves of banks, default risk (measured by the non-performing loans to total loans ratio) and the Herfindahl - Hirschman index (HHI) for banks were used as explanatory or independent variables.

The study reveals that operational efficiency contribute most to the interest rate spread followed by inflation rate. At 5% level of significance and 95% level of confidence, operational efficiency, inflation rate, size of the bank, discount rates, and treasury bill rates were all significant in interest rate spread.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter provides a summary, conclusion and recommendations of the main findings on the effect of operational efficiency on interest rate spread among commercial banks in Kenya

#### 5.2 Summary of Findings

From the above regression model, the study found out that operational efficiency, inflation rate, size of the bank, discount rates, and Treasury bill rates influenced interest rate spread. All of the variables influenced it positively. The study found out that the intercept was 1.103 for all years. In particular, the study established that the coefficient for operational efficiency was 0.852, meaning that operational efficiency positively and significantly influenced the interest rate spread among commercial banks in Kenya. This is in line with Berger, Hunter and Timme (1993) who noted that if banks are efficient, and then we might expect improved profitability, greater amounts of funds intermediated, better prices and service quality for consumers, and greater safety and soundness if some of the efficiency savings are applied towards improving capital buffers that absorb risk. Njuguna and Ngugi (2000) argue that the larger the spread between loan and deposit rates, the more likely the necessary condition for intermediation to occur can be met. In addition, Bawumia, Belnye and Ofori (2005) also indicate that high operating cost, which is mainly due to labour costs, and banks' determination to maintain high profit margins are the two bank specific factors which contribute significantly to wider interest spreads. Campion et al (2010) also pinned down that perhaps the most important is the improved operational efficiency, a key driver of lower rates comes primarily from five sources: competition, reinvestment of profits, learning by doing, pressure from donors and investors on Microfinance Institutions to be socially responsible, and the absence of interest rate caps.

Sarpong, Winful and Ntiamoah (2011) further, maintain that variations in overhead and operating costs are reflected in variations in bank interest margins as banks pass their operating costs on to depositors and lenders.

The study also deduced inflation rate positively and significantly influenced the interest rate spread among commercial banks in Kenya. This is in line with Hakan et al, (2004) who analyzed the effect of different types of inflation uncertainty on a set of interest rate spreads for the UK economy. According to this study, where three types of inflation uncertainty i.e., structural uncertainty, impulse uncertainty, and steady-state inflation uncertainty are defined and derived using a time varying parameter model, the findings were that both structural and steady-state inflation uncertainties increase interest rate spreads, while empirical evidence for the impulse uncertainty is not conclusive.

The study also established that size of the bank positively and significantly influenced the interest rate spread among commercial banks in Kenya. Boldbaatar (2006) carried out a study to examine commercial banks' interest rate spreads between lending and deposit rates and found that bigger banks tend to operate with lower spreads due to better managerial efficiency. However, Mimi (2013) conducted a study on the relationship between interest rate spread and its determinants in commercial banks in Kenya and found that bank size had a negative effect on interest rate spread, though insignificant. Correlation analysis shows that there was negative overall linear relationship between bank size and interest rate spread. The study concluded that bank-specific factors (credit risk, liquidity risk, return on assets and operating costs) significantly influenced interest rate spread.

The study also deduced that discount rates positively and significantly influence the interest rate spread among commercial banks in Kenya. Tennant and Folawewo (2007) findings is that whether or not the discount rate is still being used by the government as a means of controlling

the money supply, it is undoubtedly an important factor in determining the size of the banking sector interest rate spreads. Governments and central banks should therefore carefully consider the level at which they set their discount rates as it has significant feedback impacts on economic variables through the interest rate spreads.

The study also found out that Treasury bill rates positively and significantly influence interest rate spread among commercial banks in Kenya. This agrees with Ngugi (2004) who established that Treasury Bill Rate reduces the interest margin as it serves as a diversifying asset for the banks. On the other hand Boldbaatar (2006) carried out a study to examine commercial banks' interest rate spreads between lending and deposit rates and indicated that the factors that increase the spread in the selected SEACEN countries include market concentration and credit risks. Other studies have however found Treasury bill rates to be an insignificant determinant of interest rate spreads (Tennant and Folawewo, 2007) or only significant in the short-run (Kimutai, 2003).

### **5.3 Conclusions**

This study examined the effect of operational efficiency on interest rate spread among commercial banks in Kenya. The five independent variables that were studied (operational efficiency, inflation rate, size of the bank, discount rates, and treasury bill rates) explain a substantial 80.7% of interest rate spread among commercial banks in Kenya as represented by adjusted  $R^2$  (0.807). This is in line with Berger, Hunter and Timme (1993) who noted that if banks are efficient, and then we might expect improved profitability, greater amounts of funds intermediated, better prices and service quality for consumers, and greater safety and soundness if some of the efficiency savings are applied towards improving capital buffers that absorb risk. Njuguna and Ngugi (2000) argue that the larger the spread between loan and deposit rates, the more likely the necessary condition for intermediation to occur can be met.

The study also concludes that inflation rate positively and significantly influenced the interest rate spread among commercial banks in Kenya. This is in line with Hakan et al, (2004) who analyzed the effect of different types of inflation uncertainty on a set of interest rate spreads for the UK economy. According to this study, where three types of inflation uncertainty i.e., structural uncertainty, impulse uncertainty, and steady-state inflation uncertainty are defined and derived using a time varying parameter model, the findings were that both structural and steady-state inflation uncertainties increase interest rate spreads, while empirical evidence for the impulse uncertainty is not conclusive.

The study further concludes that size of the bank positively and significantly influenced the interest rate spread among commercial banks in Kenya. This correlates with Boldbaatar (2006) who carried out a study to examine commercial banks' interest rate spreads between lending and deposit rates and found that bigger banks tend to operate with lower spreads due to better managerial efficiency.

The study also concludes that discount rates positively and significantly influence the interest rate spread among commercial banks in Kenya. Tennant and Folawewo (2007) findings is that whether or not the discount rate is still being used by the government as a means of controlling the money supply, it is undoubtedly an important factor in determining the size of the banking sector interest rate spreads. Governments and central banks should therefore carefully consider the level at which they set their discount rates as it has significant feedback impacts on economic variables through the interest rate spreads.

The study further concludes that Treasury bill rates positively and significantly influence interest rate spread among commercial banks in Kenya. This agrees with Ngugi (2004) who established that Treasury Bill Rate reduces the interest margin as it serves as a diversifying asset for the banks. However, r studies have found Treasury bill rates to be an insignificant

determinant of interest rate spreads (Tennant and Folawewo, 2007) or only significant in the short-run (Kimutai, 2003).

The study finally concludes that size of the bank positively and significantly influenced the interest rate spread among commercial banks in Kenya. In addition, the study concludes that discount rates positively and significantly influence the interest rate spread among commercial banks in Kenya. Finally the study concludes that treasury bill rates positively and significantly influence interest rate spread among commercial banks in Kenya.

#### **5.4 Limitation of the Study**

The main purpose of this study was to investigate or establish the effect of operational efficiency on interest rate spread among commercial banks in Kenya, Central bank and commercial banks considered some information sensitive and confidential and thus the researcher had to convince them that the main purpose of information is academic research only and would not be used for any other intentions.

A second limitation of this study is that the findings are applicable to Kenyan banks and within the period of study. It is not established whether the results are applicable outside Kenya or not. Further, interest rate spread is a long term issue; the study has only given findings applicable at the time of study. As to whether the findings are applicable after the study was conducted the study has not expressly given that indication.

The third limitation of this study is that interest rates spread keeps on changing from period to period depending on prevailing economic situations in the country and demand from the central bank hence the findings may not reflect the true effect of operational efficiency on interest rate spread among commercial banks in Kenya for a period considered.



## **5.5 Recommendations**

The following recommendations are made based on the study findings

### **5.5.1 Policy Recommendations**

The central bank of Kenya as the main regulator of all commercial banks should regulate the interest rates by setting the maximum interest rates to be charged by commercial banks on loans and earned on deposits. The firms should consider operational cost efficiency analysis as an important factor in their profitability and risk analysis and management.

The central banks should apply stringent regulations on interest rates charged by banks so as to regulate their interest rate spread. Although competition in the banking sector has increased over time, it still needs to be further enhanced and supported by policies that encourage and foster competition in the financial sector. These should be complemented with measures to promote the growth and image of small and medium –sized banks in a bid to enhance their ability to penetrate the market so as to break market dominance by a few banks. These could include public education about the stability and soundness of small and medium banks and the industry as whole. Such efforts can be undertaken jointly between the regulator, the industry and individual banks.

### **5.5.2 Suggestions for Further Research**

The study suggests that further studies should be conducted in similar study for longer period of 10 years. A similar study should also be carried out too on the effect of operational efficiency on interest rate spread incorporating other variables such as the prevailing macroeconomic in a country as opposed to the current study which took only six variables into account.

A study can also be done in more than one country to make better the findings and provide

more room for generalization. This is because the findings of this study are focused on the Kenyan banks alone. A study with a wider population will be more informing and will give more generalized results.

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## APPENDICES

### **Appendix I: Commercial Banks Operating in Kenya as at 31st December 2014**

- 1 Kenya Commercial Bank Ltd
- 2 Barclays Bank of Kenya Ltd
- 3 Standard Chartered Bank Ltd
- 4 Co-operative Bank of Kenya Ltd
- 5 CFC Stanbic Bank Ltd
- 6 Equity Bank Ltd
- 7 Citibank, N.A.
- 8 National Bank of Kenya Ltd
- 9 Commercial Bank of Africa Limited
- 10 NIC Bank Limited
- 11 Diamond Trust Bank Kenya Limited
- 12 I & M Bank
- 13 Prime Bank Ltd
- 14 Bank of Baroda Ltd
- 15 Imperial Bank Ltd
- 16 Bank of Africa Ltd
- 17 Bank of India
- 18 EABS/ Ecobank Ltd
- 19 Family Bank Ltd
- 20 Chase Bank Ltd
- 21 Fina/ Guaranty Bank Ltd
- 22 K-Rep Bank Ltd
- 23 African Banking Corporation Ltd

- 24 Habib AG Zurich
- 25 Development Bank of Kenya Ltd
- 26 Giro Commercial Bank Ltd
- 27 Guardian Bank Ltd
- 28 Southern Credit Banking Corp. Ltd
- 29 Gulf African Bank Ltd
- 30 Consolidated Bank of Kenya Ltd
- 31 Habib Bank Ltd
- 32 Victoria Commercial Bank Ltd
- 33 Equatorial Commercial Bank Ltd
- 34 Fidelity Commercial Bank Ltd
- 35 Credit Bank Ltd
- 36 Transnational Bank Ltd
- 37 Middle East Bank Ltd
- 38 First Community Bank Ltd
- 39 Paramount-Universal Bank Ltd
- 40 Oriental Commercial Bank Ltd
- 41 Dubai Bank Ltd
- 42 City Finance/Jamii Bora Bank Ltd
- 43 UBA Kenya Limited

**Source:** Directory of Commercial Banks, Financial institutions, Building Societies, Mortgages Finance companies and foreign Exchange Bureau, Central Bank of Kenya, December 2014

## Appendix II: Decomposition of Interest Rate Spread in Kenya

Bank	2010	2011	2012	2013	2014
Barclays Bank	14.69%	13.23%	14.21%	12.43%	12.19%
Kenya Commercial Bank	13.84%	12.26%	16.03%	15.45%	16.55%
Standard Chartered Bank	8.60%	8.86%	10.53%	9.80%	10.77%
National Bank	8.84%	10.36%	12.50%	9.00%	10.83%
Cooperative Bank of Kenya	13.40%	5.78%	12.88%	11.71%	11.45%
Equity Bank	13.12%	13.05%	17.13%	14.15%	16.16%
Commercial Bank of Africa	7.62%	7.29%	8.72%	6.50%	7.05%
CFC Stanbic Bank	6.36%	9.12%	9.50%	8.61%	10.18%
NIC Bank	7.66%	6.99%	6.92%	7.13%	6.76%
I&M Bank	3.57%	10.66%	7.04%	7.51%	9.25%
Diamond Trust Bank	8.39%	8.93%	9.02%	8.28%	8.60%
ECO Bank	8.22%	9.17%	7.65%	6.19%	5.91%
Prime Bank	5.86%	7.01%	6.68%	6.42%	6.83%
Family Bank	14.33%	12.73%	18.15%	14.35%	16.26%
Credit Bank	11.84%	9.66%	14.46%	9.97%	11.28%
Consolidated Bank of Kenya	9.74%	9.45%	11.07%	10.01%	10.68%
Bank of Africa(BOA)	6.45%	6.11%	7.39%	6.04%	6.51%
Dubai Bank	11.35%	9.90%	14.23%	6.06%	7.50%
First Community Bank	11.63%	10.19%	10.30%	11.07%	10.41%
Equatorial Commercial Bank	6.00%	6.69%	11.08%	10.42%	12.96%
Trans-National Bank	12.62%	10.58%	11.86%	10.71%	10.33%
UBA Bank	1.65%	8.48%	15.24%	8.60%	15.40%

Chase Bank	9.74%	10.79%	11.08%	14.22%	14.89%
Imperial Bank	16.21%	17.01%	18.16%	14.80%	15.78%
ABC Bank	10.71%	8.65%	8.60%	9.12%	8.07%
Gulf African Bank	9.28%	9.16%	10.87%	10.71%	11.51%
Oriental Commercial Bank	4.13%	5.17%	7.67%	8.75%	10.52%
Jamii Bora Bank	12.24%	10.71%	7.79%	8.06%	5.84%
CITI Bank	5.96%	5.70%	9.93%	6.18%	8.17%
Bank of Baroda	7.36%	7.39%	9.09%	8.74%	9.61%
Bank of India(BOI)	7.22%	5.81%	2.16%	5.14%	2.61%
Paramount Bank	8.93%	9.20%	8.55%	8.72%	8.53%
Victoria Commercial Bank	8.98%	9.81%	9.96%	5.96%	6.45%
Habib Bank AG Zurich	8.08%	7.81%	10.53%	0.79%	2.02%
Middle East Bank	4.01%	5.04%	6.16%	4.73%	5.81%
Fidelity Bank	5.35%	5.74%	9.27%	9.92%	11.88%
K-Rep Bank	17.79%	16.82%	19.06%	15.07%	15.71%
Giro Bank	6.91%	7.96%	12.51%	8.21%	11.01%
Guardian Bank	5.60%	6.15%	6.82%	6.64%	7.25%
GT Bank	9.99%	9.79%	9.15%	9.30%	8.88%
Development Bank of Kenya	5.35%	2.66%	2.77%	3.36%	2.07%

### Appendix III: Operation Efficiency

Bank	2010	2011	2012	2013	2014
Barclays Bank	0.71	0.84	1.91	1.81	2.41
Kenya Commercial Bank	1.47	1.63	1.59	1.67	1.73
Standard Chartered Bank	2.36	2.20	2.22	2.28	2.21
National Bank	1.61	1.46	1.18	1.27	1.06
Cooperative Bank of Kenya	1.56	1.51	1.68	1.60	1.66
Equity Bank	1.68	1.79	1.88	1.84	1.94
Commercial Bank of Africa	1.74	1.68	1.91	1.77	1.86
CFC Stanbic Bank	1.32	1.41	1.51	1.80	1.90
NIC Bank	1.98	2.18	2.17	1.91	2.01
I&M Bank	2.83	2.89	1.93	3.45	3.00
Diamond Trust Bank	0.47	2.09	1.47	1.54	2.04
ECO Bank	1.11	1.07	0.36	0.57	0.20
Prime Bank	1.74	1.90	1.89	2.25	2.33
Family Bank	1.19	1.16	1.22	1.40	1.42
Credit Bank	1.08	1.11	1.18	1.13	1.18
Consolidated Bank of Kenya	1.26	1.20	0.97	0.91	0.77
Bank of Africa(BOA)	1.32	1.29	1.29	1.47	1.46
Dubai Bank	1.01	1.07	3.65	1.04	2.36
First Community Bank	0.75	1.15	1.34	1.22	1.52
Equatorial Commercial Bank	1.01	1.11	0.49	1.24	0.98
Trans-National Bank	1.50	1.54	1.42	1.40	1.36

UBA Bank	0.68	0.61	0.27	0.47	0.27
Chase Bank	1.44	1.06	2.45	1.57	2.08
Imperial Bank	1.82	1.92	1.77	1.74	1.72
ABC Bank	1.73	1.70	1.60	1.50	1.44
Gulf African Bank	1.06	1.17	1.35	1.37	1.52
Oriental Commercial Bank	2.45	1.74	1.47	1.58	1.09
Jamii Bora Bank	0.70	0.93	1.18	1.18	1.42
CITI Bank	2.55	3.38	4.19	2.92	3.74
Bank of Baroda	4.00	3.14	3.08	14.64	14.18
Bank of India(BOI)	6.54	4.12	2.69	4.41	2.49
Paramount Bank	2.37	1.03	0.57	1.43	0.53
Victoria Commercial Bank	2.46	2.21	2.56	2.48	2.53
Habib Bank AG Zurich	1.95	1.87	2.22	2.56	2.70
Middle East Bank	1.91	1.38	1.19	1.26	0.90
Fidelity Bank	2.12	1.67	1.19	1.51	1.05
K-Rep Bank	1.10	1.19	1.22	1.41	1.47
Giro Bank	2.74	1.88	1.45	1.88	1.24
Guardian Bank	1.64	1.38	1.54	1.77	1.72
GT Bank	1.12	1.25	0.57	1.38	1.11
Development Bank of Kenya	1.81	1.53	1.37	1.73	1.51
Housing Finance	1.51	1.80	1.68	1.74	1.83
Habib Bank	2.49	2.42	3.04	3.19	3.47

**Source: Research Findings**

**Appendix IV: Inflation rate**

<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
9.1	4.7	18.9	13.5	18.4
5.9	4.1	18.3	12.3	18.5
5.3	3.6	16.7	11.1	16.8
4.1	4.2	15.6	10.2	15.95
2.7	3.9	13.1	8.7	13.9
3.2	4.7	12.2	8	12.5
4.3	4.5	10.1	9.1	12
3.3	14.49	7.7	11.1	13.3
2.6	16.6	6.1	9.8	11.55
3.1	15.5	5.4	10	11.15
2.9	17.3	4.14	11	11.62
2.7	19.7	3.3	11.1	11.4

**Source: Kenya National Bureau of Statistics**



## Appendix V: Total assets

TOTAL ASSETS	2010	2011	2012	2013	2014
Kenya Commercial (KCB)	172,690,915	181,362,909	189,960,007	227,952,008	236,586,554
Equity Bank Limited	223,024,556	185,045,537	245,327,012	294,392,414	305,543,642
Co-op Bank	142,880,029	136,300,031	157,168,032	188,601,638	195,745,640
Barclays Bank	133,889,997	110,892,925	147,278,997	176,734,796	183,429,296
Standard Chartered Bank Ltd	153,983,533	121,584,510	169,381,886	203,258,264	210,957,441
CFC Stanbic Bank	62,069,592	51,861,444	68,276,551	81,931,861	85,035,341
Commercial Bank of Africa	63,591,642	56,544,849	69,950,806	83,940,967	87,120,549
Diamond Trust Bank Kenya	58,605,823	49,120,844	64,466,405	77,359,686	80,289,977
I & M Bank	60,026,694	20,108,837	66,029,363	79,235,236	82,236,571
Citibank, N.A.	54,776,432	5,643,113	60,254,075	72,304,890	75,043,712
NIC Bank Ltd	62,552,113	107,070,759	68,807,324	82,568,789	85,696,395
National Bank(NBK)	107,138,602	26,066,762	117,852,462	141,422,955	146,779,885
Bank of Africa	29,325,841	63,391,119	32,258,425	38,710,110	40,176,402
Bank of Baroda (K) Ltd	6,215,384	4,031,443	6,836,922	8,204,307	8,515,076
Chase Bank Limited	32,444,424	7,588,811	35,688,866	42,826,640	44,448,861
Prime Bank Limited	4,530,094	16,893,919	4,983,103	5,979,724	6,206,229

Housing finance	10,478,682	7,455,678	11,526,550	13,831,860	14,355,794
Ecobank Kenya Ltd	19,399,089	3,700,905	21,338,998	25,606,797	26,576,752
Family Bank	8,031,214	4,940,509	8,834,335	10,601,202	11,002,763
Imperial Bank Limited	4,761,853	48,410,144	5,238,038	6,285,646	6,523,739
Bank of India	32,331,505	24,133,579	35,564,656	42,677,587	44,294,163
Consolidated Bank of Kenya	14,112,365	20,164,375	15,523,602	18,628,322	19,333,941
Fina Bank Limited	8,208,537	6,048,455	9,029,391	10,835,269	11,245,696
Equitorial Commercial Bank	1,723,233	539,979	1,895,556	2,274,668	2,360,830
Gulf African Bank	10,233,964	7,605,934	11,257,360	13,508,832	14,020,530
African Banking Corporation	26,699,124	18,611,958	29,369,036	35,242,844	36,577,800
Giro Commercial Bank	20,188,379	14,636,347	22,207,217	26,648,660	27,658,079
Development Bank of Kenya	10,649,758	8,920,352	11,714,734	14,057,681	14,590,169
Fidelity Commercial Bank	21,858,603	14,266,683	24,044,463	28,853,356	29,946,286
K-Rep Bank Ltd	4,419,806	3,410,386	4,861,787	5,834,144	6,055,135
Guardian Bank	19,671,456	16,934,028	21,638,602	25,966,322	26,949,895
First community Bank	10,398,805	56,509,079	11,438,686	13,726,423	14,246,364
Habib AG Zurich	10,348,739	4,907,563	11,383,613	13,660,335	14,177,772
Victoria Comm. Bank Ltd	4,558,349	9,868,836	5,014,184	6,017,021	6,244,939

Transnational Bank Limited	26,892,185	3,357,545	29,581,404	35,497,684	36,842,294
Habib Bank Limited	8,127,135	15,344,340	8,939,849	10,727,818	11,134,175
Credit Bank Ltd	4,018,428	8,073,252	4,420,271	5,304,325	5,505,247
Oriental Comm. Bank	7,670,050	3,455,519	8,437,055	10,124,466	10,507,969
Paramount-Universal Bank	5,425,541	7,849,960	5,968,095	7,161,714	7,432,991
Middle East Bank of Kenya	1,874,268	5,124,672	2,061,695	2,474,034	2,567,748
UBA BANK	9,594,061	1,756,038	10,553,467	12,664,161	13,143,864
Dubai Bank Limited	6,380,098	8,523,834	7,018,108	8,421,729	8,740,734
Jamii Bora Bank	3214789	4,896,789	4,451,627	3214790	3214790

**Source: Kenya National Bureau of Statistics**

**Appendix VI: Discount rate**

2010	2011	2012	2013	2014
0.07	0.08	0.076	0.078	0.080
0.075	0.077	0.073	0.075	0.075
0.06	0.079	0.08	0.084	0.091
0.044	0.049	0.051	0.051	0.059
0.07	0.077	0.073	0.078	0.080
0.075	0.081	0.082	0.088	0.084
0.061	0.06	0.056	0.066	0.060
0.081	0.086	0.087	0.072	0.078
0.084	0.085	0.086	0.091	0.092
0.097	0.059	0.081	0.095	0.091
0.077	0.083	0.082	0.086	0.087
0.059	0.069	0.065	0.073	0.075

**Source: Research Findings**

**Appendix VII: Treasury bills rate**

<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
0.058	0.064	0.058	0.066	0.066
0.065	0.076	0.073	0.081	0.085
0.059	0.073	0.065	0.079	0.082
0.076	0.077	0.074	0.093	0.092
0.071	0.089	0.084	0.085	0.0915
0.09	0.097	0.131	0.156	0.1765
0.053	0.055	0.062	0.073	0.0775
0.06	0.067	0.058	0.065	0.064
0.064	0.064	0.067	0.074	0.0755
0.02	0.047	0.033	0.032	0.0385
0.066	0.073	0.08	0.076	0.083
0.082	0.076	0.069	0.076	0.0695

**Source: Research Findings**