THE EFFECT OF LOAN SIZE ON INTEREST RATE SPREAD IN COMMERCIAL BANKS IN KENYA

BY

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DECLARATION

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

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DEDICATION

To my wife, Judy Wanjiru, my mother, Jane Wandia and our future children

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ABBREVIATIONS

AIC	Akaike Information Criterion
CBK	Central Bank of Kenya
CMA	Capital Markets Authority
GDP	Gross Domestic Product
GLS	Generalised Least Squares
IRS	Interest Rate Spread
MFI	Microfinance Institution
OLS	Ordinary Least Squares
SSA	Sub-Saharan Africa
UK	United Kingdom
US	United States

ABSTRACT

The objective of this study was to examine the effect of loan size on the interest rate spread in commercial banks. This study was largely a quantitative research. Given that the purpose of this study was to examine the effect of loan size on the interest rate spread, the appropriate design was causal predictive research design. The study population was drawn from commercial banks currently licensed and trading in Kenya. Since the number of banks is not so large, all the 43 commercial banks were targeted in the study. Secondary data was used in this study. This was collected from annual reports of the 43 commercial banks for the 10 year period between 2004 and 2013. The collected data was organised into SPSS and analysed using descriptive analysis, correlation analysis, and regression analysis.

The study found that the model accounted for 87.1% of the variance in interest rate spread of the commercial banks R^2= .871). The *F*-statistic of 1.683 was not significant at 5% level of significance, p = .425. This shows that the model was not fit to explain the effect of loan size on the interest rate spread. The results show that loan size, credit risk, operating costs and liquidity have a weak negative effect on the interest rate spread of the banks while bad loans/total loans, collateral/total loans, bank size and performance had weak positive effect on the interest rate spreads of the commercial banks. All the effects were insignificant at 5% significance level. The study therefore concludes that loan size does not influence the interest rate spread of the commercial banks. The study recommends that other factors that influence the interest rates of commercial banks be used in order to ensure that commercial banks set optimal interest rate spreads and thus improve their performance.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Commercial banks play a fundamental role in the economy by undertaking intermediation functions. Banking business involves receiving funds from the public by accepting demand, time and saving deposits or borrowing from the public or other banks, and using such funds in whole or in part for granting loans, advances and credit facilities and for investing funds by other means (Chirwa, 2001).

This process of accepting deposits and lending takes place at a cost in the form of interest to the depositor as well as to the borrower. The interest paid to the depositor and the interest charged on the borrower creates a spread called interest margin on the banks because ideally the banks pay lower interest to the depositors and charge higher interest to the borrowers. In this sense, net interest margin is the difference between interest earned and interest expended by a bank divided by its total assets.

1.1.1 Interest Rate Spread

An efficient and vibrant commercial banking and financial system are essential ingredients for any market economy to become successful. It is expected to provide lifeblood to the efficient and effective functioning of an economy. Commercial banks mobilize savings by offering various types of deposit products to savers and channel such savings as loans and advances to borrowers and investors. The difference between the rates at which banks lend money to borrowers and the rate they are paying to depositors are generally known as ―interest rate spread‖ (IRS). The efficiency of the banking system is reflected by series of financial indicators and more importantly by IRS and Net Interest Margin (NIM).IRS is an important indicator of

efficiency level of a bank or banking system. It reflects profit maximizing ability of the financial intermediaries (Bandaranayake, 2014).

Over the past few years, interest rate spread of commercial banking system has caught researchers ‘attention throughout the world. As financial intermediaries, banks play a crucial role in the operation of most economies. The efficiency of financial intermediation can affect economic growth. Crucially, financial intermediation affects the net return to savings and the gross return to investment (Demirguc-Kunt, & Huizinga, 1999).

According to the prior researchers, IRS is described in several ways. IRS is a key variable in the financial system and when it is too large, it is generally regarded as a considerable impediment to the expansion and development of financial intermediation, as it discourages potential savers with low returns on deposits and limits financing for potential borrowers, thereby reducing feasible investment opportunities and therefore the growth potential of the economy (Barajas, Steiner, and Salaza, 1999). Robinson (2002) highlights that loan rates charged by commercial banks can be separated into two major components. One is the interest rate paid to depositors and the other rate is risk premium. That difference between the deposit rate and the loan rate is commonly referred to as the spread. IRS is defined as the difference between average interest rate earned on interest earning assets (loans) and average interest rate paid on deposits (Jayaraman and Sharma, 2003).

The magnitude of the spread will be depending on the determinants which determine it. Jayaraman and Sharma (2003) recognized the reasons for high IRS as lack of adequate competition, scale diseconomies due to small size of markets, high fixed and operating costs, and high transportation costs of funds perceived market risks and the risk profile of the bankers. Khawaja and Din (2007) examine to what extent macro-

economic variables influence the IRS. The central bank influences the yield on treasury bills of a country. That in turn affects the deposit and lending rates.

1.1.2 Loan Size

Loan portfolios are loans that have been made or bought ad are held for repayment. Loan portfolios are the major asset of banks, thrifts, and other lending institutions. The value of a loan portfolio depends not only on the interest rates earned on the loans, but also on the quality or likehood that interest and principal will be paid. The loan portfolio is typically the largest asset and the predominate source of revenue. As such, it is one of the greatest sources of risk to a bank's safety and soundness. The level of interest risk attributed to the bank's lending activities depends on the composition of its loan portfolio and the degree to which the terms of its loans (e.g., maturity, rate structure, and embedded options) expose the bank's revenue stream to changes in rates (Nakayiza, 2013)

Loan size can be measured in terms of loan supply or demand and loan repayment. Loan size has been a subject of interest to scholars who have studied banking. It has been studied either as a dependent variable or as an independent variable. In this study, loan size is studied as an independent variable. In the present study, loan size will be measured as the amount of loans given in a year. The level of interest rates has a direct effect on a consumer's ability to repay a loan. For example, Thordsen and Nathan (1999), assert that when interest rates are low, people are willing to borrow because they find it relatively easy to repay their debt. When interest rates are high, people are reluctant to borrow because repayments on loans cost more. Some consumers may even find it difficult to meet their existing loan repayments, especially if interest rates increase faster than the rise in a consumer's income. If interest rates

rise sharply and stay high for a long period, some consumers will default on their loans.

1.1.3 Relationship between Interest Rates Spread and Loan Sizes

The theoretical relationship between interest rate and supply of loan could be observed through reading articles regarding monetary policy and bank lending under direct credit channel of credit view. Direct credit channel of credit view argue that when Fed sells government securities to the public in exchange for checks drawn on private bank in the economy, the reserve accounts of the bank is actually being debited by the Central Bank. If reserves fall below the Central banks legal reserve requirements, the banking system as a whole must reduce its holdings of deposits. According to the basic equation of accounting, asset must always equal to liability plus equity. Therefore when deposits are reducing the supply of the bank loan must also reduce. This will increase the loan rates which means the cost of borrowing will be higher. Thus it will contract the spending in the economy.

According to Calcagnini et al. (2012a) who studied the link between loans, interest rates, and guarantees found that loan size was negatively related with bank interest rate spread. Calcagnini et al. (2012b) examined the impact of financial crisis on bank loans interest rates and guarantees and revealed that interest rate spread was negatively influenced by loan size. Moore & Craigwell (2013) examined the relationship between interest rates and loan sizes in Barbado and found that interest rate was positively related with size of bank loans.

Further, Yusoff, Rahman, & Alias (2001) examined the relationship between interest and loan supply of Islamic and Conventional banking system in Malaysia and found positive relationship between bank loan growth and interest rates. Akinlo &

Owoyemi (2012) examined the determinants of interest rate spreads in Nigeria and found a positive relationship between interest rate spread and loan size. On the other hand, Steffen (2008) examined how lending relationships affect loan rate smoothing in UK and found a negative but insignificant effect of loan size on interest rate spread.

Theoretically therefore, loan sizes should be positively related with interest rates because the interest rates proxy risks associated with higher loans but empirical studies have found mixed results as far as this relationship is concerned. Further, it is not empirically settled on whether there is a unidirectional or bidirectional relationship between interest rates and loan sizes and if unidirectional, from which end the relationship runs.

1.1.4 Commercial Banks in Kenya

The Banking industry in Kenya is governed by the Companies Act, the Banking Act, the Central Bank of Kenya Act, and the various prudential guidelines issued by the Central Bank of Kenya (CBK). The banking sector was liberalised in 1995 and exchange controls lifted. The Central Bank of Kenya, which falls under the Ministry of Finance, is responsible for formulating and implementing monetary policy and fostering the liquidity, solvency and proper functioning of the financial system. Central Bank of Kenya publishes information on Kenya's commercial banks and non-banking financial institutions, interest rates and other publications and guidelines (CBK, 2011)

Banks represent a significant and influential sector of business worldwide that plays a crucial role in the global economy. Commercial banks are financial intermediaries that serve as financial resource mobilization points in the global economy. They channel funds needed by business and household sectors from surplus spending to

deficit spending units in the economy. A well-developed efficient banking sector is an important prerequisite for saving and investment decisions needed for rapid economic growth. A well-functioning banking sector provides a system by which a country's most profitable and efficient projects are systematically and continuously funded. The role of commercial banks in Kenya is paramount because they execute monetary policy and provide means for facilitating payment for goods and services in the domestic and international trade.

Commercial banks are custodians of depositor's funds and operate by receiving cash deposits from the general public and loaning them out to the needy at statutorily allowed interest rates. Loans are based on the credit policy of the bank that is tightly coupled with the central bank interest rate policy. These in effect determine the level of financial risk in a particular bank (CBK, 2010).

From the perspective of the banks, interest rate spread (IRS) shows the additional cost of borrowing that the banks take on to perform intermediation activities between borrowers and fund lenders. The IRS is also a premium for the risk that the banks undertake; it compensates for loan defaults and for risk related to cost of funding. As such, IRS as a measure of bank efficiency and determinant of intermediation cost and profitability of the banks has drawn increasing attention of researchers and policymakers in recent years in Kenya.

1.2 Research Problem

Commercial banks are important financial sector players in terms of holding deposits for clients and providing loans to businesses and individuals. These credits go a long way in providing the necessary impetus to grow businesses and therefore the economy. Traditional finance theory argues that as the size of a loan expands, the

interest rate on that loan rises to accommodate the increased risk associated with the loan. However, some studies have proved this theory wrong.

The banking industry in Kenya is dominated by few large banks that have most of the deposits and also loan accounts. Despite efforts by the Central Bank of Kenya to drive the cost of borrowing down by maintaining the base lending rate at 5% of the last few years, the lending rates are still very high. This could affect the loan sizes in the banking industry. Since there is no empirical study that has examined this relationship, the present study delves into answering this specific question of how bank loan size and interest rates are related.

Studies in this area have provided mixed results. For instance, while other have found a negative relationship (e.g. Moore & Craigwell, 2000; Calcagnini et al. 2012a, Calcagnini et al. 2012b; Bharath et al. 2011; Cotler & Almazan, 2013; Annim, 2009) others have found positive relationships (e.g. Yusoff, Rahman & Alias, 2001; Akinlo & Owoyemi, 2012) while others have found no significant relationship (e.g. Steffen, 2008). Further, Yusoff et al. (2001) argued that the relationship ran from loan size to interest rate and not the other way round plunging into insignificance the efforts to improve loan sizes using changes in interest rates. No study in Kenya has specifically examined this issue but a number exists on interest rate determination (Ndung'u & Ngugi, 2000; Ngugi, 2001; Moore &Craigwell, 2000; Were & Wambua, 2013). With these inconsistencies, the present study sought to examine the relationship between interest rates and bank loan sizes. The study sought to answer the following research question: what is the relationship between interest rate spread and loan sizes of commercial banks in Kenya?

1.3 Research Objective

The objective of this study was to examine the effect of loan size on the interest rate spread in commercial banks.

1.4 Value of the Study

This study will be of significance to the banking sector. All banks could use the knowledge derived from this study to better understand the impact of interest rate on loan sizes. In addition management and directors of banks could use results of the study to guide them in coming up with the firm's credit policy.

Government and financial policy makers will benefit from this study as they will be able to gain insight on factor influencing lending rate and formulate policies that will enable commercial bank determine effective lending rates. The CBK could use the results of this study to establish the interest rate policies in use by the commercial banks and this would help them in formulating regulatory policies for commercial banks.

Academicians will benefit from the findings of this study as it will add to the body of existing knowledge in finance. The results will establish how loan sizes relate with interest rates and therefore similar or related studied in the future could use this study as a reference material.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature review. Theoretical literature is first presented followed by a review on determinants of interest rate other than loan sizes. Then, an empirical review on the relationship between interest rates and loan sizes is presented. Finally, the chapter summary and research gap is provided.

2.2 Theoretical Literature

This section reviews theories of interest rate. The specific theories reviewed are the real model of interest rate, monetary loanable funds model, liquidity preference theory, Bohm-Bawerk's theory of interest, and Fisher's theory of interest.

2.2.1 Real Model of Interest Rate

This theory was authored by Inayat (1993). In the classical economic theory, saving and investment out of a full employment level of income are regarded as a function of the interest rate alone and interest is the primary force of an economic system. In the real model of interest rate, its determinants are the real forces of investment and saving. The demand and supply of new bonds are functions of planned saving and planned investment alone. There are two specific features of the real theory interest: the supply of bonds being related to firm's desire to invest; and the demand for and supply of new bonds rather than the existing stock of bonds. The first feature means that a fall in interest rates will lead to an increase in the supply of bonds. The second feature provides a supply and demand function and the equilibrium interest rate is determined by the equality of planned saving and planned investment (Inayat, 1993).

This model however ignores two important factors. First, being a partial equipment result it ignores the effect of other markets, on the saving and investment. Secondly, it does not include money as an asset and is based on the assumption that the only assets that consumers can hold are bonds, and similarly the only assets that firms can hold are physical capital.

2.2.2 Monetary Loanable-Funds Model

Early writers as Thornton (1802), the ones from Swedish school such as Wicksell (1936) and Ohlin (1937), of the English school such as Robertson (1937) considered the role of monetary factors and incorporated the demand for and supply of money in the theory of interest. They were the early proponents of this theory.

The model is formulated in terms of the flow demand for and supply of loanable funds, i.e., new bonds. The flow demand for bonds constitutes planned saving plus increase in the stock of money over time. The demand for loanable funds, or flow supply of bonds, is subject to demand for investment in capital goods plus demand for loans from ones wishing to build up stock of money balances. The equilibrium interest is where investment and saving are equal (Inayat, 1993).

The theory of often questioned by the fact as to why the whole use in the stock of money goes into the purchase of stock. It is however contended that even if part of stock of money goes into consumption, the equilibrium equation stays valid as increase in consumption involved an equal fall in savings.

2.2.3 Liquidity Preference Theory

This theory was proposed by Keynes (1936). The liquidity preference theory stems from the Keynesian analysis of the determinant the interest rate in money market. This assertion and the contention that the loanable fund theory is expressed in terms

of flow and liquidity preference theory in terms of stock forms the basis of the two substantial differences between the theories. Liquidity theory postulates that the interest rate changes, if there is excess demand or supply in the money market irrespective of the situation in the bond market (Inayat, 1993).

Keynes assumed that the excess demand for money always equals the excess demand for bonds, therefore, envisaging an equilibrium in the money and bond market. Another major assumption in the model refers to supplies of money and of bonds as exogenous. The liquidity preference theory is formulated in terms of the demand for money as a desired stock of money and the supply of money being the existing stock of money.

2.2.4 BohmBawerk's Theory of Interest

Bohm-Bawerk (1959) is the chief exponent of time preference theory which is generally known as Austrian theory of capital and interest. The classification of both land and labour as original factors of production with their supply fixed and capital as produced factor which is supply a function of economic decision and dependent on land and labour is fundamental to Bohm-Bawerk's theory of interest (Inayat, 1993).

Bohm-Bawerk fives three reasons for the under valuation of future goods. First, in the context of equi-marginal principle the rational individual shall so distribute his expected future income among different years so as to ensure that the marginal unit of currency received in any year makes the same contribution to total utility as any other. The expected flow of income shall be converted into consumption expenditure in a manner so as to equalise the weighted marginal utility of consumption over all future periods (Inayat, 1993).

The second reason why people, on average, prefer present to future i.e. having positive time preference relates to the psychological factor, a tendency towards myopia which is attributed to (a) deficiency of imagination (b) limited will power and (c) the shortness and uncertainly of life (Inayat, 1993).

The third reason for interest pertains to the fact that s present goods are practically more useful and employable, they carry a higher value and are regarded superior to future goods. The third reason therefore creates an excess demand for production loans in the sense of the technical superiority of present over future goods (Inayat, 1993).

It can therefore be inferred from the above that the first two reasons operate to create an aggregate excess demand for consumption loans i.e. different circumstances of want and provision in the present and future, underestimation of the future, and the third reason creates excess demand for production loans on the grounds of the technical superiority of present over future goods.

2.2.5 Fisher's Theory of Interest

Fisher (193) proposed this theory. The theory, by employing the concept of opportunity line and willingness line, reaches on the result of discount factor of which is analogous to Bohm-Bawerk's three famous causes of interest discussed above. It is, in his theory, the interaction of willingness and opportunity which determines the rate of interest (Inayat, 1993).

Fisher's real rate of interest framework is essential for the inflation-targeting framework. It provides a rationale for the idea that monetary policy should be concerned mainly (if not only) with managing inflation expectations in order to keep real interest rates at a stable level that promotes saving and investment. Some post-

Keynesians, like Smithin (2003) or Cottrell (1994), have also promoted the use of this concept, even if the former claimed that it only represents a definition and does not have anything to do with Fisher. Many authors have challenged the notion of real rate at the empirical level but only a few have done it at the theoretical level. Among those exceptions are authors like Keynes, Hahn, Harrod, Davidson, and Kregel.

2.3 Determinants of Bank Interest Rates

Studies that examine determination of bank interest rate generally use variables that fall in three categories (1) individual bank-specific factors such as operating or administrative costs, non-performing loans, return on asset, structure of the balance sheet, non-interest income or non-core revenues, bank size, liquidity ratio of a bank, among others; (2) factors specific to the banking industry such as the degree of competition as could, for instance, be indicated by market concentration, regulatory requirements such as minimum core capital requirements, statutory reserve requirements or regulated minimum deposit rates; and,(3) macroeconomic indicators which include growth rate of the real Gross Domestic Product (GDP) growth rate and inflation rate. Some studies focus on one category of factors while others consider two or all the three categories of factors in estimating the interest rate spread. A brief review of some of the previous empirical studies on interest rate spread is given below.

2.3.1 Loans Size

The interest rate on loans depends positively on real GDP and inflation. Better economic conditions increase the number of projects becoming profitable in terms of expected net present value and hence increase the demand for credit (Kashyap et al., 1993).As stressed by Melitz and Pardue (1973) only boosts in permanent income have

a positive influence on loan demand, while the effect due to the transitory part could also be associated with a self-financing effect that reduces the proportion of bank debt (Friedman and Kuttner, 1993). An increase in the money market rate raises the opportunity cost of other forms of financing (i.e. bonds), making lending more attractive. This mechanism also boosts loan demand and increases the interest rate on loans (Gambacorta, 2008).

2.3.2 Bank Size

Bank size is measured as the log of total bank's assets. Ideally one would expect bigger banks to be associated with lower interest rate spreads, arguably because of large economies of scale and ability to invest in technology that would enhance efficiency (Were & Wambua, 2013). However, to the extent that bank size connotes control of the market in the deposit and loan markets, a positive relationship between interest rate spreads and bank size should not be surprising.

2.3.3 Credit Risk

Non-performing loans to total loans ratio (NPLR) is used as an indicator of credit risk or quality of loans. An increase in provision for loan losses implies a higher cost of bad debt write offs (Were & Wambua, 2013). Given the risk-averse behaviour, banks facing higher credit risk are likely to pass the risk premium to the borrowers, leading to higher spreads. Hence the higher the risk, the higher the pricing of loans and advances to compensate for likely loss.

2.3.4 Bank profitability – ROA

Bank profitability is usually measured by the return on assets (ROA). This is computed as net income divided by total assets. This is generally considered as a good indicator to evaluate the profitability of the assets of a firm in comparison to other

firms in the same industry (Were & Wambua, 2013). A positive relationship with interest rate spreads is hypothesized.

2.3.5 Operating Costs

This is usually computed as ratio of operating costs to total net operating income. Banks incur costs of financial intermediation such as screening loan applicants to assess the risk profile of borrowers and monitor the projects for which loans are advanced. An increase in operating costs is expected to have positive influence on interest rate spreads (Were & Wambua, 2013). High operating costs are likely to include costs due to inefficiency leading to higher spreads and hence this variable is commonly used as an indicator of operational inefficiency. A higher cost of financial intermediation will drive up interest rates on loans while depressing interest rates on deposits.

2.3.6 Liquidity Risk

Liquidity risk is usually computed as the ratio of bank's liquid assets to total assets. The degree to which banks are exposed to liquidity risk varies across banks. A bank with higher liquidity faces lower liquidity risk hence is likely to be associated with lower spreads duet a lower liquidity premium charged on loans (Were & Wambua, 2013). Banks with high risk tend to borrow emergency funds at high costs and thus charge liquidity premium leading to higher spreads (Ahokpossi 2013).

2.4 Empirical Review

2.4.1 International Studies

Yusoff, Rahman, & Alias (2001) examined the relationship between interest and loan supply of Islamic and Conventional banking system in Malaysia. Using monthly bank data from May 1999 to August 2001 and a 3-month Klibor as a proxy for loan rates,

the study employed Granger causality to test the direction of relationship and identified lags using the Akaike Information Criterion (AIC). The Granger causality showed that the direction of relationship moved from interest rate to loan supply and not the other way round. The study confirmed that Islamic and Conventional loan growth of merchant banks were significantly positively related to the growth of overnight Klibor but Islamic loan growth of merchant bank was more sensitive to the changes in the growth of overnight Klibor. The study concluded that effect of direct channel of credit view was vague since the Granger causality test showed that changes in loan rates causes changes in loan supply.

Afanasieff et al (2002) applies the two-step approach of Ho and Saunders (1981) to study the interest rate spread in Brazil by estimating an unbalanced panel data model of 142 commercial banks using monthly data from February 1997 to November 2000. In the first step, it estimated a panel model with time dummy coefficients which are the then used in the second step as the dependent variable on which a measure of interest rate risk and selected macroeconomic variables are used as regressors. Unlike most studies that define the interest rate margin based on interest income and interest expense, Afanasieff et al (2002) defines the spread on the basis of lending and deposit rates as posted by banks. They find that the spread is higher the larger a bank is, the larger the operating costs, bank leverage, ratio of service revenues to operational revenues and ratio of non-interest bearing deposits to total operating assets. However, the spread is found to be negatively related to the ratio of interest-bearing funds to earning assets and foreign-ownership of banks.

Brock and Franken (2003) studies interest rate spread in Chile, showing that that the influence of industry concentration, business cycle variables, and monetary policy

variables on interest rate spreads differs markedly depending on whether the spreads are computed from balance sheet data or from disaggregated loan and deposit data.

Gambacorta (2004) studies factors explaining cross-sectional differences in bank interest rates of Italian banks by considering both micro and macroeconomic factors. The variables considered include: (i) loan and deposit demand (ii) operating cost, credit risk and interest rate volatility (iii) impact of monetary policy through changes in policy rates and reserve requirements and (iv) the structure of the industry. Results showed that interest rates on short term lending of liquid and well capitalised banks react less to monetary policy shocks. In addition, banks that predominantly lend for long term do not change their interest rates more frequently as those whose lending is largely for short term. Bank size was found to be irrelevant in influencing interest rate margins.

According to Gambacorta (2004), changes in monetary policy can affect deposit and lending rates through the interest rate, bank lending and bank capital channels. For instance, a monetary tightening that raises policy rate and short term interest rates makes it more costly for banks to get funds and they pass these costs to borrowers through higher lending rates. The bank lending channel works through moral hazard and adverse selection. Following monetary tightening that leads to higher interest rates, banks tend to attract more risky customers and to compensate for the higher risk they increase lending rates.

Bharath et al. (2006) studied whether size matters in the relationship between lending relationships and loan contract terms in US. The OLS regression results showed that loan amount had a negative effect on cost of borrowing. This leads to the conclusion that cost of borrowing is high for smaller loans and vice versa which is inconsistent with traditional finance theory.

Beck and Hesse (2006) uses bank-level dataset on the Ugandan banking system to examine the factors behind the consistently high interest rate spreads and margins. While foreign banks have lower interest rate spreads, there is no robust and economically significant relationship between interest spread and privatization, foreign bank entry, market structure and banking efficiency. Similarly, macroeconomic variables explain little of the over-time variation in bank spreads. Bank-level characteristics, on the other hand, such as bank size, operating costs, and composition of loan portfolio, explain a large proportion of cross-bank, cross-time variation in spreads and margins. However, time-invariant bank-level fixed effects explain the largest part of bank variation in spreads and margins. Further, the study finds evidence that banks targeting the low end of the market incurred higher costs and therefore had higher margins.

Grenade (2007) estimates the determinants of commercial banks interest rate spreads in the Eastern Caribbean Currency Union using annual panel data of commercial banks. The empirical model includes regulatory variables (statutory minimum savings deposit rate) as well as market power, operating costs as a ratio of earning assets, ratio of provisions for loan losses to total earning assets as a measure of credit risk, liquidity risk proxied by the ratio of liquid assets to total assets and real GDP as an indicator of economic activity. Market power is proxied by the Herfindahl-Hirschman index (HHI) computed using the market shares of loans and advances in the banking industry. The spread is found to increase with an increase in market power, the regulated savings deposit rate, real GDP growth, reserve requirements, provision for loan losses and operating costs.

Aboagye, et 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.

Steffen (2008) examined how lending relationships affect loan rate smoothing in UK for the period 1996 – 2005. Using panel data regression techniques on the data, the study found a negative but insignificant effect of loan size on interest rate spread thus leading to the conclusion that loan size does not significantly affect bank interest rates.

Annim (2009) examined sensitivity of loan size to lending rates using microfinance sector data in Ghana. Data was based on a survey of client and non-client households. The sample size was 2,691 units consisting of 1,589 clients and 1102 non-clients households. Using OLS and quantile regression estimates, the study finds a negative effect of interest rate on amount of current loan.

Siddiqui (2012) estimates the interest rate spread in Pakistan based on individual bank specific factors using annual panel data of 22 banks. The variables include market share measured as a bank's deposits as a percentage of total deposits of the banking sector, liquidity risk variable, administrative expenses as a percentage of total assets, nonperforming loans as a percentage of net advances, net interest income as a percent of total income and return on assets after payment of tax as a percent of average assets. The spread is found to be significantly affected by administrative costs, non-performing loans and return on assets in all the regressions (pooled, fixed and random effects regressions).

Mannasoo (2012) investigates the role of the recent global financial crisis on interest spreads in Estonia. The approach follows works of Ho and Saunders (1981) in which the spread is decomposed into a pure spread and the remaining component that is explained by market structure, regulation and idiosyncratic bank factors. The pure spread is explained by the degree of bank risk aversion and the market structure of the banking sector. The volatility of money market interest rates is found to have a long-run impact on the spread. Other factors that drive the interest margins are the regulatory variables, efficiency of banks and bank-portfolio effects. Credit risk was found to play a minimal role while higher bank liquidity was associated with lower interest margin.

Akinlo & Owoyemi (2012) examined the determinants of interest rate spreads in Nigeria using a panel of 12 commercial banks for the period 1986-2007. The pooled and fixed effects regression results showed that bank loan size had a positive effect on interest rate spread. Thus as loan sizes rise, the interest rate spread also rise.

Calcagnini et al. (2012a) sought to examine the link between loans, interest rates and guarantees in Italian banks. The study used 60 large Italian banks, 300,000 firms and 200,000 producer households which received loans of a certain amount. Using random effects panel data analysis technique, the study found that loan size was negatively related to interest rate spread (measured as interest rate – overnight rate). Larger loans therefore tended to results in lower interest rate spread and vice versa.

Calcagnini et al (2012b) analysed the role of guarantees on loan interest rate before and during the recent financial crisis in Italian firm financing. The data for 2006 – 2009 was used from the Bank Supervisory Reports. Loan size had a negative effect on bank loan interest suggesting that higher loan sizes were associated with lower bank loan interest.

Cotler & Almazan (2013) studied the determinants of lending interest rates of microfinance institutions (MFIs). Using data from 1,299 MFIs in 84 countries and employing a GLS regression, the study found that average loan size was negatively related with lending interest rates.

In a study to determine the determinants of interest rate transmission, Saborowski & Weber (2013) examined whether financial dollarization (proportion of foreign loans to total loans) affects interest rate pass-through. The results showed that financial dollarization has a significant and sizable influence on pass-through which suggests that the loan amounts held by foreign firms influence local interest rates.

Nampewo (2013) studies the determinants of the interest rate spread of the banking sector in Uganda using time series data for the period 1995 – 2010.The study applies the Engle and Granger two-step procedure to test for cointegration between the bank rate, treasury bill rate, exchange rate volatilities, the ratio of money supply to gross domestic product (M2/GDP) and the proportion of non-performing loans to total private sector credit. Results show that the interest rate spread in Uganda is positively affected by the bank rate, the Treasury bill rate and non-performing loans. On the other hand, M2/GDP ratio and real GDP have a negative influence on the spread. However the analysis is undertaken at macro level hence concealing micro and bank-specific characteristics.

2.4.2 Studies from Kenya

In Kenya, few studies exist that examine the interest spread determination. Beck et al (2010) examine developments in Kenya's financial sector with a specific focus on stability, efficiency and outreach, and use interest rate spreads as a proxy for the efficiency of financial intermediation. They base their analysis on export constructed

spreads and decompose the spreads into different components based on a set of factors such as overhead costs, loan loss provisions and taxes.

Among the most cited studies on factors explaining interest rate spread in Kenya are Ndung'u and Ngugi(2000) and Ngugi (2001). Ndung'u and Ngugi (2000) theoretically derived factors likely to explain the interest rate spread and empirically estimatedan interest rate spread equation using monthly timeseries data for the period April 1993 to June 1999,while Ngugi (2001) extends the monthly time seriesdata to December 1999. The factors considered bythe former are deposits, loans, treasury bill rate andinterbank rate. They find that the spread are positivelyrelated with deposits but negatively related to loans.In addition to the factors above, Ngugi (2000) incorporates excess liquidity and non-performing loans ratio as explanatory variables and finds that arise in non-performing loans ratio leads to a rise in spreads while excess liquidity is negatively related with spreads. Both studies are undertaken at the macro level, mainly focusing on the macro industry-level variables. Nonetheless, they both ignore macroeconomic indicators such as GDP and inflation.

Moore &Craigwell (2000) used firm-level data of Barbadian banking industry to examine the relationship between interest rates and loan sizes. Six banks were studied for the period 1986 to 1998. Using fixed effects panel data framework, the study found a negative relationship between interest rates and loan sizes. The study concluded that interest rates differences were as a result of smaller loans among other factors. This was contrary to traditional finance theory which argues that as loan sizes rise, interest rates also rise to accommodate the increase in associated risk of the loan.

A study by Were & Wambua (2013) goes beyond these factors by considering not only macroeconomic variables but also bank-specific variables using panel data for the commercial banks. Additionally, the study covers a more recent period ranging

from 2002 to 2011 during which there have been significant changes both in the policy and macroeconomic environment. The study finds that bank-specific factors play a significant role in the determination of interest rate spreads. These include bank size based on bank assets, 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 had higher spreads compared to small banks.

2.5 Summary of Literature Review

The theoretical review shows that a number of theories explain interest rates determination. These theories have not been tested in the context of commercial banks in Kenya and it may therefore be interesting to examine which of the theories best explain interest rate determination for commercial banks in Kenya.

From the empirical review above, it can be observed that while other studied have found negative relationship between interest rate and loan size, others have found positive effects while others have found no significant relationships. Further, one study was clear that the direction of the relationship runs from loan sizes to interest rate and no the other way round as has been assumed by most scholars. Thus, the results as to the relationship are inconsistent hence need for further research. Secondly, no study of this nature has been done in Kenya hence the need for the present study. Thirdly, it will be important to estimate the direction of relationship for Kenyan banking industry hence the need for the present study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology adopted in this study. Specifically, the chapter discusses the research design, population of the study, study sample, data collection procedures, and data analysis process.

3.2 Research Design

This study was largely a quantitative research. Given that the purpose of this study was to examine the relationship between interest rates and loan sizes, the appropriate design was causal predictive research design. According to Cooper & Schindler (2014), a causal-predictive study attempts to predict an effect on one variable by manipulating another variable while holding all other variables constant.

3.3 Population and Sample

The study population was drawn from all the 43 commercial banks (see appendix 1 for the list) licensed and trading in Kenya as at 1st June 2014(Central Bank of Kenya, 2014). The 43 commercial banks therefore formed the population of the study. Since the number of banks is not so large, all the 43 commercial banks were targeted in the study.

3.4 Data Collection

Secondary data was used in this study. This was collected from the Central Bank of Kenya's Banking Supervision reports from all the banks for the 11 year period between 2003 and 2013 (see appendix 2 for the data). This data was collected from CBK's website which reports annually on the performance of the banking sector.

3.5 Data Analysis

The collected data was organised using MS Excel Spreadsheets and analysed in SPSS version 22 using both descriptive, correlation and regression analysis. First, descriptive analysis was performed to examine the data in terms of mean, standard deviation, and normality. This was summarised in tables and charts where necessary.

To examine the relationship between interest rates and loan sizes, the following model was adopted:

$$Interest\ Rate\ Spread = \alpha + \beta_1\ Loan\ Size + \beta_2 Bad\ Loans/Loans + \beta_3\ Collateral/Loans + \beta_4\ Bank\ Size + \beta_5\ Credit\ Risk + \beta_6 Operating\ Costs + \beta_7\ Liquidity\ Risk + \beta_8 ROA + \varepsilon$$

The dependent variable was interest rate spread. The independent variable was loan size while the rest of the variables are control variables. The relationship between interest rate spread and loan size was controlled for the effects of firm characteristics as well as other bank specific factors. These variables were operationalised as follows:

Table 3.1: Measurement of Variables

Variable	Measure
Interest rate spread	The difference between interest charged on loans and that charged on deposits
Loan size	Amount of loans given in a year
Bad Loans/Loans	Ratio between bad loans and total loan size in a year
Collateral/Loans	Ratio of collateralized loans and total loans in a year
Bank size	Log of total bank assets
Credit risk	Ratio of non-performing loans to total loans
Operating costs	Log of operating
Liquidity risk	Ratio of bank liquid assets to total assets
Return on Assets	Net income divided by average total assets

A correlation analysis was carried out to test the serial correlations among the independent variables. A multiple regression analysis was then being carried out.

ANOVA and F-test showed the fitness of the model used in the study. The coefficients showed how each of the variables influenced loan sizes. The results of significance were interpreted at 5% level of significance. Both p-values and t-tests were interpreted.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the data analysis results and the discussion of findings. The results are shown in terms of the descriptive analysis, correlation analysis and regression analysis.

4.2 Descriptive Statistics

Table 4.1 shows the summary descriptive results for all the variables used in the study. The table shows the number of observations (N), the mean, and the standard deviation.

Table 4.1: Summary Descriptive Statistics

	N	Min	Max	Mean	SD
Interest rate spread	11	7.80	12.40	9.29	1.32
Loan size	11	874,511.00	1,564,635	1,097,423.40	203,422.54
Bad loans/Total loans	11	0.00	0.00	0.00	0.00
Collateral/Total loans	11	0.35	0.80	0.61	0.15
Bank size	11	14.03	14.81	14.34	0.23
Credit risk	11	4.40	23.10	12.18	7.64
Operating costs	11	7.64	10.01	8.95	17.42
Liquidity	11	32	47.00	39.63	4.88
Performance	11	0.01	0.03	0.02	0.01

Source: Research Data (2014)

The results presented in Table 4.1 show that interest rate spread ranged from 7.8 to 12.4 with a mean of 9.2 and a standard deviation of 1.32. Loan size ranged from 874511 to1564635 with a mean of 1097423 and a standard deviation of 203422. The ratio of bad loans to total loans recorded a mean of 0.000036 and a standard deviation of 0.0000165. The ratio of collateral to total loans ranged from 0.35 to 0.8 with a

mean of 0.6087 and a standard deviation of 0.15079. Bank size ranged from 14.03 to 14.81 with a mean of .6087 and a standard deviation of .15079. Credit risk ranged from 4.4 to 23.1 with a mean of 14.34 and a standard deviation of 0.22. Operating costs ranged from 7.64 to 10.01 with a mean of 8.95and a standard deviation 17.42. Liquidity ranged from 32 to 47 with a mean of 39.62 and a standard deviation of 4.88. Performance ranged from 0.01 to 0.03 with a mean of 0.2 and a standard deviation of 0.01.

4.3 Correlation Analysis

Table 4.2 presents the results of the correlation analysis which was done to examine any serial correlations among the independent variables which, when entered into the model for regression analysis, would lead to spurious results.

Table 4.2: Correlation Matrix

		1	2	3	4	5	6	7	8
1.	Loan size	1							
2.	Bad loans/total loans	-.025	1						
3.	Colateral/Total loans	.560	.083	1					
4.	Bank size	.839**	.146	.387	1				
5.	Credit risk	-.544	-.553	-.358	-.804**	1			
6.	Operating costs	.614*	.317	.282	.920**	-.917**	1		
7.	Liquidity	-.040	.427	-.109	.211	-.389	.347	1	
8.	Performance	.543	.280	.193	.849**	-.898**	.970**	.291	1

***Correlation is significant at the 0.01 level (2-tailed).*
**Correlation is significant at the 0.05 level (2-tailed).*
Source: Research Data (2014)

The results presented in Table 4.2 show that bank size and loan size are highly correlated. This also included operating costs and bank size, performance and bank size as well as performance and operating costs. The rest of the correlations were low. These variables were however left in the model due to their importance to the current study.

4.4 Regression Analysis

Table 4.3 shows the regression model summary results. The results show the values of R, R^2, adjusted R^2, and the standard error of estimate.

Table 4.3: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.933	0.871	.35	1.06

Source: Research Data (2014)

The results in Table 4.3 show that the independent variables had a high correlation with the interest rate spread (R = 0.933). The model accounted for 87.1% of the variance in interest rate spread of the commercial banksR^2= .871).

The results in Table 4.4 present the ANOVA from the regression analysis showing the significance of F-statistic.

Table 4.4: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	15.175	8	1.897	1.683	.425
Residual	2.254	2	1.127		
Total	**17.429**	**10**			

Source: Research Data (2014)

Table 4.4 shows that the *F*-statistic of 1.683 was not significant at 5% level of significance, p = .425. This shows that the model was not fit to explain the relationship between interest rate spread and bank size.

Table 4.5 shows the results of the regression coefficients. The significance is shown in terms of t-values and the p-values.

Table 4.5: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	-99.695	137.081		-.727	.543
Loan size	-1.775E-6	.000	-.273	-.282	.805
Bad loans/total loans	32,760.753	37,978.517	.410	.863	.479
Colateral/Total loans	1.063	3.640	.121	.292	.798
Bank size	13.815	12.393	2.376	1.115	.381
Credit risk	-.001	.186	-.005	-.005	.997
Operating costs	-10.805	5.171	-6.280	-2.089	.172
Liquidity	-.070	.090	-.260	-.783	.515
Performance	504.771	230.658	4.007	2.188	.160

Source: Research Data (2014)

The results presented in Table 4.5 show that loan size had a negative effect on interest rate spread ((β = -0.000001775, p = 0.805) and this effect was insignificant at 5% level. The results also show that bad loans/total loans had a positive effect on interest rate spread (β = 32760.753, p = 0.479) and this effect was insignificant at 5% level. The results also show that collateral/total loans had a positive effect on interest rate spread (β = 1.063, p = 0.798) and this effect was insignificant at 5% level. The results also show that bank size had a positive effect on interest rate spread (β = 13.815, p = 0.381) and this effect was insignificant at 5% level. The results also show that credit risk had a negative effect on interest rate spread (β = -.001, p = 0.997) and this effect was insignificant at 5% level. The results also show that operating costs had a negative effect on interest rate spread (β = -10.805, p = 0.172) and this effect was insignificant at 5% level. The results also show that liquidity had a negative effect on interest rate spread (β = -.070, p = 0.515) and this effect was insignificant at 5% level. Finally, the results show that performance had a positive effect on interest rate spread

(β = 504.771, p = 0.160) and this effect was insignificant at 5% level. The model thus becomes:

Interest Rate Spread = -99.695–-0.000001775Loan Size + 32,760 Bad Loans/Loans + 1.063 Collateral/Loans + 13.815Bank Size –0.001Credit Risk –10.805Operating Costs –0.07Liquidity Risk + 507.771ROA

4.5 Summary and Interpretation of Findings

The study examined the effect of loan size on interest rate spreads. Loan size was measured as the amount of loans given in a year. The study found that loan size had a weak negative effect on interest rate spread (β = -0.000001775, p = 0.805. This means that interest rate spread is not influenced by the loan size of the bank.

The results show that loan size, credit risk, operating costs and liquidity have a weak negative effect on the interest rate spread of the banks. The results also show that bad loans/total loans, collateral/total loans, bank size and performance had weak positive effect on the interest rate spreads of the commercial banks. These effects were insignificant at 5% significance level. These results therefore show that loan size does not influence the interest rate spread of the commercial banks.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The objective of this study was to examine the effect of loan size on the interest rate spread in commercial banks. This chapter presents the summary of findings, conclusion, recommendations, and suggestions for further research.

5.2 Summary and Interpretation of Findings

The study sought to establish the effect of loan size on the interest rate spread in commercial banks in Kenya. Interest rate spread was measured as the difference between interest charged on loans and that charged on deposits. The regression results show that the model accounted for 87.1% of the variance in interest rate spread of the commercial banks (R^2= .871). The ANOVA results show that the *F*-statistic of 1.683 was not significant at 5% level of significance, p = .425, thus the model was not fit to explain the effect of loan size on the interest rate spread.

The study examined the effect of loan size on interest rate spreads. Loan size was measured as the amount of loans given in a year. The study found that loan size had a weak negative effect on interest rate spread (β = -0.000001775, p = 0.805. This means that interest rate spread is not influenced by the loan size of the bank.

The study examined the effect of bad loan/ total loans on interest rate spreads. Bad loans/total loans was measured as the ratio between bad loans and total loan size in a year. The study found that bad loans/total loans had a weak positive effect on interest rate spread (β = 32760.753, p = 0.479). This means that interest rate spread is not influenced by the ratio of bad loan/ total loans of the bank.

The study examined the effect of collateral/ total loans on interest rate spreads. Collateral/total loans was measured as the ratio of collateralized loans and total loans in a year. The study found that collateral/total loans had a weak positive effect on interest rate spread (β = 1.063, p = 0.798). This means that interest rate spread is not influenced by the ratio of collateral/ total loans of the bank.

The study examined the effect of bank size on interest rate spreads. Bank size was measured as the log of bank assets. The study found that bank assets had a weak positive effect on interest rate spread (β = 13.815, p = 0.381). This means that interest rate spread is not influenced by the bank size.

The study examined the effect of credit risk on interest rate spreads. Credit risk is measured as the ratio of non-performing loans to total loans. The study found that credit risk had a weak negative effect on interest rate spread (β = -.001, p = 0.997. This means that interest rate spread is not influenced by the credit risk of the bank.

The study examined the effect of operating costs on interest rate spreads. Operating costs are measured as the log of operating costs. The study found that operating costs had a weak negative effect on interest rate spread (β = -10.805, p = 0.172). This means that interest rate spread is not influenced by the operating costs of the bank.

The study examined the effect of liquidity on interest rate spreads. Liquidity risk is measured as ratio of bank liquid assets to total assets The study found that liquidity risk had a weak negative effect on interest rate spread (β = -.070, p = 0.515). This means that interest rate spread is not influenced by the liquidity risk of the bank.

The study examined the effect of performance on interest rate spreads. Performance is measured in terms of ROA (ratio of net income to average total assets). The study found that performance had a weak positive effect on interest rate spread (β =

504.771, p = 0.160). This means that interest rate spread is not influenced by the performance of the bank.

5.3 Conclusions of the Study

The study found that loan size had a negative but insignificant effect on interest rate spread. This leads to the conclusion that the interest rate spreads of commercial banks in Kenya are not influenced by the loan size of the bank. This is consistent with some of the past studies on interest rate spreads.

The study found that bad loans/total loans had a positive but insignificant effect on interest rate spread. Consistent with some past literature on the factors that influence interest rate spreads, the study concludes that interest rate spreads of commercial banks in Kenya are not influenced by the ratio of bad loans to total loans of the bank.

The study found that collateral/total loans had a positive but insignificant effect on interest rate spread. The study therefore concludes that interest rate spreads of commercial banks in Kenya are not influenced by the ratio of collateral to total loans of the bank. This is consistent with the results of some of the past studies on interest rate spreads.

The study found that bank assets had a positive but insignificant effect on interest rate spread. The study therefore concludes that interest rate spreads of commercial banks in Kenya are not influenced by the bank assets. This is consistent with the results of some of the past studies on interest rate spreads.

The study found that credit risk had a negative but insignificant effect on interest rate spread. Consistent with some past literature on the factors that influence interest rate spreads, the study concludes that interest rate spreads of commercial banks in Kenya are not influenced by the credit risk of the bank.

The study found that operating costs had a negative but insignificant effect on interest rate spread. Consistent with some past literature on the factors that influence interest rate spreads, the study concludes that interest rate spreads of commercial banks in Kenya are not influenced by the operating costs of the bank.

The study found that liquidity risk had a negative but insignificant effect on interest rate spread. The study therefore concludes that interest rate spreads of commercial banks in Kenya are not influenced by the liquidity risk of the bank. This is consistent with the results of some of the past studies on interest rate spreads.

The study found that performance had a positive but insignificant effect on interest rate spread. Consistent with some past literature on the factors that influence interest rate spreads, the study concludes that interest rate spreads of commercial banks in Kenya are not influenced by the performance of the bank.

5.4 Limitations of the Study

The study relied on secondary data from the annual banking supervision reports. While this is a reliable source of data, it is quantitative in nature and therefore it was not possible to fully interrogate the factors that influence the interest rate spreads of commercial banks as may have been the case if interviews were conducted. To improve this, it will be important to used mixed methods in data collection.

The study used data from the banking supervision reports of the Central Bank of Kenya. These reports are summaries of the banking sector performance on various indicators. While this was easier to collect and therefore more useful for the study, it provided only the time series data on an industry level and not individual bank level. Thus, the use of such data may limit the way the results are applied to the firms as they are industry specific and not firm specific.

The study covered 11 year period beginning 2003 to 2013. While this period is fairly long, it is not long enough to show the long run effect of loan sizes on interest rate spread in Kenya. This may therefore limit the applicability of the model to infer interest rate spreads in Kenya.

Most of the variables examined in this study as control variables were firm specific. Most of the macroeconomic factors were not addressed. Thus, the study may be limited in its application as the factors were not exhaustive in explaining interest rate spread.

5.5 Recommendations of the Study

5.5.1 Recommendations for Policy and Practice

The independent variables used in the study did not significantly influence the interest rate spreads of the commercial banks. The study therefore recommends that other factors that influence the interest rates of commercial banks be used in order to ensure that commercial banks set optimal interest rate spreads and thus improve their performance.

The study also recommends that the Government, through the Central Bank of Kenya should be instrumental in developing policies and regulations to guide commercial banks in setting up of optimal interest rate spreads in order to promote loan uptake as well as improve performance of these commercial banks. Increased loan uptake will lead to growth in the economy of the country.

5.5.2 Suggestions for Further Research

The study suggests that a comprehensive study is carried out to evaluate various other factors that may influence interest rate spreads as well as through the use of primary data. Further, this can be done by using mixed methods

There is also need for more studies to examine the factors that influence the interest rate spreads of commercial banks. This will be important in providing insights into how the setting up of interest rate spreads by commercial banks can be improved.

Future studies can use an improved model with more industry-specific and macro-level control variables in the model as such may improve the accuracy of the model and therefore lead to better and robust results.

Studies also need to be done on this subject using panel regression techniques. These will provide more robust results than the current study which was based on the time series data. Panel regressions will also be more firm specific.

There is also need for more studies to be done in Kenya to assess the direction of the long run relationship between bank loans and interest rates. This is because the assumption in this study was that the long run relationship was unidirectional running from loan size to interest rates.

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Appendix 1: List of Commercial Banks in Kenya

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

(Source: Central Bank supervision department report – 2014)

Appendix 2: Research Data

Year	IRS	Loan size	Bad loans/Loans	Colateral/Loans	Bank Size	Credit Risk	Operating costs	Liquidity	ROA
2013	10.30	1,564,635.00	0.000035	0.65539	14.8100186	4.90	10.0082	38.60	0.0329
2012	8.20	1,318,570.00	0.000027	0.74733	14.6615226	4.40	9.8395	41.90	0.0322
2011	9.40	1,180,956.00	0.000030	0.63613	14.4434609	4.70	9.6796	37.00	0.0341
2010	9.80	905,002.00	0.000051	0.45526	14.3599048	6.80	9.5748	44.50	0.0334
2009	8.80	1,145,658.00	0.000068	0.79644	14.3528369	8.10	9.0631	39.80	0.0202
2008	8.70	1,025,365.00	0.000040	0.72700	14.3188601	8.80	8.9276	45.10	0.0182
2007	8.20	1,002,454.00	0.000054	0.55101	14.2489008	10.20	8.7709	41.00	0.0167
2006	8.50	874,511.00	0.000018	0.50463	14.2304176	20.80	8.5849	33.00	0.0141
2005	7.80	954,261.00	0.000029	0.35304	14.1699357	20.60	8.3563	47.00	0.0119
2004	10.10	1,125,664.00	0.000012	0.79545	14.1520721	23.10	8.0594	36.00	0.0090
2003	12.40	974,582.00	0.000027	0.47442	14.0318317	21.60	7.6352	32.00	0.0067

Source: Central Bank of Kenya