

**EFFECT OF INTEREST RATE SPREAD ON FINANCIAL  
PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

**BY**

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT  
OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF BUSINESS  
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UNIVERSITY OF NAIROBI.**

**DECEMBER, 2018**

**DECLARATION**

I, the undersigned, declare that this research proposal is my original work and has not been submitted to any other college, institution or university for academic credit.

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Date: .....

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**D61/84124/2015**

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## **ACKNOWLEDGEMENT**

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I owe deep gratitude to my supervisor Dr. Winnie Nyamute, for positive remarks, recommendations as well as inspiration that made the production of this research project achievable .This work was demanding but you were ever at my disposal for advice and guidance.

I would like to convey my earnest thanks to my parents and siblings for their sacrifices, encouragement and tolerance throughout my studies.

## **DEDICATION**

This project is dedicated to my husband Moses, my father James Nyaberi, my mother Bathiswa Kerubo and my siblings.

This project is also dedicated to all my friends.

## **ABSTRACT**

Kenyan Commercial banks have had a period of good returns for the last five years until a law that tried to cap interest rates was passed and assented to in parliament in the year 2016. This has drastically impinged on the Kenyan commercial banks' performance, with many banks laying off workers and closing branches. The CBK through the governor to the CBK has been vocal in trying to ensure that the capping of the interest rates have been removed. This debate has brought out the importance of the interest rate spread to a commercial bank. The margin between the amount the CBK charges the commercial banks (CBR Rate) and the lending rate by the individual bank. The study therefore focused to verify the bearing of interest rate spread on financial performance of commercial banks in Kenya for a five year period between 2013 and 2017. The study used a multiple regression model to analyze secondary data in order to explore the bearing of interest rate spread on Kenyan commercial banks' performance. Descriptive research design was used which determine relationships between variables. The investigation considered every licensed commercial bank in Kenya and of which had complete data for the five year period under study. 35 commercial banks were therefore studied that represented a response rate of 83.3%. Data validity was emphasized in which case the use of normality tests and multicollinearity test was undertaken so as to validate data in undertaking a multiple regression analysis. The Pearson's correlation analysis was undertaken that showed positive correlation between interest rate spread and financial performance. The regression model summary showed a coefficient of determination of 42% and the F test statistics used had F calculated value greater than F critical that led the study to decline the null hypothesis. The significance of the study (p value) was less than alpha of 0.05 which concluded that data was significant. The study therefore found that there existed a positive substantial bearing of interest rate spread on Kenyan commercial banks' performance.

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# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

Interest rates are linked with the rates of interest and the capital structures of commercial banks. The rates of interest manifest by the effect they have on the investors' cost of capital and return to the different savers. Any variation in the interest rates impinges on a firm's obligation or equity decision, overall capital costs and rates of interest thereby triggering decisions impinging on the amount of the desired capital stock, its return, savings availability and the promptness of regulating the real capital stock to the amount that is desired. According to Hualan (2007) interest rate ranks among the major factors that influence bank's financial performance. Indeed they are also regarded as key economic aspects that determine an economy's growth. Corb (2012) averred that rates of interest are monetary tools that the regulatory uses to control inflation and spur economic growth.

Interest rate has been of interest by different scholars and researchers in the economic and financial environment. The classical theory recognizes the interest rates have some bearing on the investment and willingness of the investors to save, hence a major consideration in the varying financial market (Maynard, 2014). The Keynes liquidity theory identifies the interest rate on the economy's money demand as well as supply, thus being a determinant on the level of the liquidity in an economy (Keynes, 1936). The loanable fund theory which is an elaboration of the classical theory in terms of the spread of the investment due to the level of the money's demand and supply in an economy of the loanable funds (Kumar, 2015)

It is recognized a correlation between interest rate spread and financial establishment's financial performance, which shows the short as well as long-run interest rates has an effect on the net margins (NIM) of the commercial banks. It is then prudent for the net interest rates spread through the financial institutions be managed and controlled in order to positively affects the commercial banks' profitability, as for the development of the commercial banks are essential for the growth of the economy. Hence, this investigation targets to determine the influence of the interest rate spread on Kenyan commercial banks' financial performance (Crowley, 2004).

### **1.1.1 Interest Rate Spread**

Brock and Rojas (2000) put forward that interest rate spread (IRS) is the margin between interest revenue and interest payment as a proportion of aggregate earning assets. Spread is determined by the market structure aspects of the banking segment as well as government policy. Risk-averse banks have smaller spreads than risk-neutral ones because risk aversion increases the banks, rate of interest and decreases the total loans given out. Emmanuelle (2003) averred that actual spread is affected by monetary as well as fiscal policies. Spreads are determined together with the interest of the clients aimed at coupled with a good comprehension of competition in the industry. It is noteworthy that within the prevailing financial enterprise setting, competition is contributing to the decline of spread.

Frenkel (2010) stated that Micro finance entities have their aimed at clients where they regard their capacity that is willing to remain transacting with the financial institutions stated. Pricing strategies used by banks negatively affect their performance greatly hence necessitating them to establish competitive spreads on the credit. The Central Bank's credit is anticipated to be paid back at a yield. This is a revenue stream for the government to help it finance its obligations. This makes the interest rate an enterprise tool to the public administration as well as financial institutions .Chirwa (2002) studied commercial banks in Malawi and verify that if interest rate is left unchecked major banks can exploit customers by charging high lending rate and keeping interest rate on deposits low.

Interest rate spreads has a vital economic implication for the progress. Various authors have suggested that a substantial association exists between the bank's intermediation proficiency and growth of the economy. Quaden (2004) assert banking system that are more proficient helps economy through offering high anticipated yields for investors with a financial overflow, and low credit costs for financing in new ventures requiring external funding. Large spread for the banking sector inhibits prospective savers for the reason of the low deposits yields hence limiting loanable funds availability for prospective borrowers. Valverde (2004) argues that a limited amount savings is ultimately available for investments due to the low returns on deposits. Increased inefficiency by banks rises the costs of intermediation which grows the percentage of savings sunk in the intermediation process. The effect of this is reduced savings, investments and economic growth.

### **1.1.2 Financial Performance**

This is the measurement of how efficiently a firm can make use of its available resources to make profit. According to Genay (2014), financial performance is the capacity of a business to accumulate sustainable profit from its clients. Profitability is one of the key indices of the financial performance that refers to the overall amount of cash generated from the operations of the firm after deducting all expenditure and operational costs (Abertazzi & Gambacorta, 2006). Making profit is one of the ways commercial banks can be assured of their sustainability in the financial market.

The commercial banks' financial performance is determined by several aspects whose indicators differ. There are some common indicators that have been used by commercial banks over the years in determining their financial performance in the market like the operating income which is the income from the operating activities, net profit being the income after all the expenses and costs (Bikker, 2010). The operating income is the most common indicator of the Kenya commercial banks' financial performance, since it is determined by the interest rates of assets. It is highest when the overall interest rates are maximum and this applies to fluctuating interest rates, thus explaining why most bank interest rates fluctuate with the total operating income (Kalari & Koo, 2015)

The operating expense is another indicator of the commercial bank financial status and comprises the expenses incurred by a commercial bank in the ongoing operations. The interest rates are a key indicator as they measure the interest payment rates of liabilities especially on deposits. Because interest rate is variable to the total operating expenses it is

a key element of financial performance. The operating income and operating expense are the main indicators of the commercial banks' financial performance. They are directly influenced by the interest rate, other factors being constant. Return on Assets (ROA) can be used to determine the commercial bank profitability relative to the bank size. It involves comparing the net income with the assets. Net Interest Margin (NIM) is used to determine the equity holder's stake while the return on equity (ROE) gives the shareholders the exact amount earned by the commercial bank in return to their equity (Bikker, 2010)

### **1.1.3 Interest Rate Spread and Financial Performance**

This is the highest determinant of the operating income of a bank in a given year. A similar trend is also observed when it comes to the operating expenses, where again the expenses of running the bank are majorly determined by the interest rates spread of the particular financial institution. However, to completely understand how the interest rates spread affect a bank's financial performance, we need to highlight the two key principles of interest rates that affect a bank. First, all banks make a profit from the difference between the lending rates given to the borrowers and the deposit rates given to the customer making deposits into the banks. This always results in a lending spread that falls when the return curve flattens (Genay, 2014). Secondly, greater interest rates spread decrease the present discounted of assets' amount. This is because banks keep fixed returns assets e.g. credits as well as bonds. Furthermore, banks encounter bigger shortfalls when the duration of their assets increases relative to that of the liabilities (King, 2015).

The empirical link between interest rates and Kenyan commercial banks' financial performance has been confirmed in various studies previously undertaken. Sattar and Khan (2014) in their study concluded that interest rates considerably affect the bank's interest income. They further proved that returns of bank is linked to interest rates that shows that the commercial banks' financial performance and the interest rates offered to investors cannot be separated. Another study by Okoye and Onyekachi (2013) supports the link between interest rates spread and bank financial performance and go beyond to conclude that the two are intertwined and hence the significant relationship.

Were and Wambu (2013) stated that if interest rates earned by banks drop, it has a direct impact on bank profits. Low interest rate periods mean more individuals will demand loans and if spread is constant banks will gain from the enhanced interest earnings Interest has implicit bearing on financial performance by affecting the economy, excessive lending rates discourage borrowing thus resulting to less investment. Through multiplier effect savings are diminished which negatively affects banks performance Ngugi (2004). The reverse holds in periods of minimal interest rate. In concluding interest rate spread affects financial performance optimistically and adversely subject to interest rate variation.

#### **1.1.4. Commercial Bank in Kenya**

Commercial bank are financial institutions involved in the creation of money and credit services, they are vital to nations' economies because they are beneficial to lenders savers and contribute to the economic growth and development (Thomas, 2006). All commercial banks in Kenya irrespective of size or location provide basically similar services to their

customers (Saunders & Cornett, 2003). They however differ in the composition of their assets and liabilities. The development of the in Kenyan commercial banks is related to the business connections in East African region whereby in which over the time they have massive growth powered by contemporary operation paradigms leading to improved customer services and growth. (Sashoo, 2012). Presently, 42 commercial banks are operational in Kenya (CBK, 2017).

They are controlled by the Central Bank of Kenya (CBK) under, the Banking Act and the Companies Acts of Kenya that guides the operations of the commercial banks. The CBK defines regulatory framework and policies so as to maintain and achieve economic growth in the country through the banking industry (CBK, 2016). In spite of the regulations by the CBK, the interest rate remains concern in the banking industry, especially after the liberalization of the interest rate ceiling on loans which has resulted to a slowdown in economic growth (Were &Wambu, 2017). There was need to understand how the interest rate was determined before it affected the operations of the banking industry which ultimately will affect the financial performance of banks.

The banking industry has persistently registered exponential growth in profits up to when the interest rates were regulated. It showed a 3.4 % reduction between December 2016 to March 2017 attributable to the banks' reduction of lending (Cytton, 2015). But the profitability of the Kenyan commercial banks have however shown constant or improved financial performance in spite of the recent reforms. (Were &Wambua, 2013)



## **1.2 Research Problem**

Liquidity preference theory states that short term horizons witness by greater volatility in rates of interest as opposed to long-term. In short term, there is greater volatility in interest rates compared to long term. To compensate themselves for the risky interest rates in the short term, investors would demand for a higher premium to hold securities within this period as compared to long term (Keynes, 1936). It indicates the link between the amount of money that people strive to keep and the interest rate.

The loanable funds concept of interest rates alternatively states that loanable funds' demand and supply determines the available disposable income that influences saving and investment (Al-Shubir I & Jamil, 2017). A simultaneous variation in loanable funds' demand and supply would result into an effect that dependent on direction and magnitude of loanable funds' demand and supply. According to the concept, factors with an influence on disposable income also influence interest rate spread.

Globally, Boldbaatar (2006) contended interest rate spread is still contentious whereas several associate it with market or banks inadequacy. The study indicated spread is the fundamental of bank performance and the banks able to maintain spread perform better other factors held constant. Sattar and Khan (2014) established a link between interest rate and banks financial performance being a global investigation in Pakistan there some variation may existence creating the difference in their operational structure. Malik (2015) studied on the consequence s of interest rates on banks profitability. The established a

positive correlation link between interest rates and profitability although the investigation only focused on the ROA, ROE and NIM.

Locally, Ng`etich (2011) said that banks that do well maintain interest spread. A lot of studies concluded that the spread is attributed to inefficiencies in the banking segment. Many argue that huge banks are more proficient relative to undersized as well as emerging ones. It is likely that huge bank bear narrower spread than undersized banks as deduced by Ngugi (2000). This too opposes Omoles (2009) investigation of interest spread that ascertained that undersized banks bear narrower spread relative to huge ones. His contention was for undersized as well as emerging banks to lessen interest cost and offer good rates on deposits. Slight spread is seen to prompt savings and therefore enhance economic performance whereas large spread discourages savings hence less savings and less investments.

In the past three-year interest charged by some banks was as excessive as 25% whereas interest got by savers remained minimal, As lending rate increased, interest on deposits was constant resulting in an extremely large spread over 20% This led to the legislators threatening control interest rates capping. To control spread and protect borrowers, banks contended that Kenya is an open market and those plan would harm them. Numerous investigations have been undertaken on interest spread as well as its bearing on financial performance, numerous concluded that interest rate spread results from inefficiency as verified by Boldbaatar (2006). Ngugi (2011) investigation ascertained that interest rate spread impacts bank financial health, his investigation involved just a few Kenyan banks

not all. Numerous investigations undertaken entailed fewer variables that impinges on banks financial situation. Were et al. (2017) established that interest rate spread impacts financial performance banks although the study was done before the interest rate capping.

Several investigations fail to determine the degree of the bearing of interest rate spread on banks' financial performance more so after interest rate capping in the Kenyan commercial banks. If the effect of interest rate spread to financial performance of banks is determined policy makers will gain an idea of the effect of capping on the spread. Most of the inferences are made when in view of determinants of interest rate spread. This investigation will answer the question: Does interest rate spread affect the financial performance of in Kenyan commercial banks?

### **1.3 Objective of the Study**

This research aims to investigate the bearing of interest rate spread on financial performance of commercial banks in Kenya.

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

The study will aid the in comprehending the effect of interest rate spread on the commercial banks' financial performance. It will help policy makers in Kenyan in planning and forecasting the effect of their procedures to make sure that banks operate profitably. Law makers will be able to establish laws with proper comprehension of the effect of the interest rate spread that will contribute to positive economic progress. The investigation will also be valuable to the academicians by offering a body of knowledge regarding the interest rate spread. The study will provide literature for future researchers on this area.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This part presents the concepts that form the basis of the study. The chapter also looks at the factors affecting commercial banks' financial performance. Empirical reviews are also illustrated. The gaps from the reviewed literature are clearly shown. The conceptual framework showing relationship between variables is also shown.

### **2.2 Theoretical Review**

It looks at theories that form the basis of a study. A theory is a composition of facts and constructs that explain a given phenomenon. This study will be informed by the Loanable funds Concept of Interest and the Liquidity Preference Concept.

#### **2.2.1 Loanable Fund Theory of Interest**

This hypothesis was advanced by Wicksell (1952). The theory is premised on the fact that these markets for loanable funds are highly segmented with greater mobility of funds. The theory further assumes that the level of competition in the market is perfect. Thus, parties (both lenders and borrowers) in the market are price takers. Both income and rates of return are clearly known. Thus, participants are Able to make well informed and rational choices. The theory indicates that calculation of interest rate is based on loanable funds' demand and supply available in any even exchange market. This theory suggests that both investments and savings play an important role in determining long run interest rates. High interest rates reduce savings and thus investment. This ultimately reduces the available money in the economy. The disposable income of consumers is also reduced. When

interests are low, borrowing increases and thus an increase in investment. In summary, the disposable income amount is a determinant of loan interest rates such that variations in this rate affect this income. The calculation of short-term interest conversely is based on the prevailing financial conditions in an economy (Wicksell ,1952).

According to this theory, nominal interest rate is calculated on the basis of associations between loanable funds' demand and supply. Holding a similar supply level, an upsurge in loanable funds' demand would result into a rise in rates of interest. The converse is true. Conversely, the available disposable income is reduced. Conversely, a rise in loanable funds supply would bring about a reduction in interest rate. A simultaneous variation in both loanable funds' demand and supply would result into an effect that dependent on direction and magnitude of both demand and supply of the loanable funds. This hypothesis is pertinent to this investigation as it explains factors resulting into interest rate spread in an economy. According to the theory, factors with an influence on disposable income also influence interest rate spread.

### **2.2.2 Liquidity Preference Theory**

This hypothesis was formulated by Keynes (1936). Liquidity preference according to the theory is the link between the amount of money that people strive to retain and the rate of interest. Consistent with Keynes, individuals retain funds because of three key reasons; transaction, precautionary as well as speculative drives. In transaction drive, individuals retain funds so as to be able to buy goods and services when need arises. In this case, money acts as a medium of exchange. With regard to precautionary motive, the unforeseen emergencies require that people hold money. In terms of speculative motive, people hold

on money so that they are able to invest in profitable projects. The theory is premised on the fact that people store their wealth in form of securities (money or bonds).

### **2.3 Determinants of Financial Performance of Commercial Banks**

This section looks at factors affecting financial performance of commercial banks. The identified factors include size of the bank, inflation and interest rate spread. Each of these factors has been discussed in detail.

#### **2.3.1 Bank Size**

It commonly examined by natural log of assets. Commercial banks are classified in terms tiers based on their relative share and asset base in the industry. Large banks are in position to enjoy economies of scale like trade discounts, reputation and advanced distribution channels. This increases their financial performance. Small banks on the other hand limited abilities to expand and thus their financial performance is affected the already established larger banks (Berger & Black, 2011).

#### **2.3.2 Inflation**

This is as an economy's persistent upsurge in overall prices of commodities and services (products). This rise in price affects the purchasing power of consumers and thus reducing the sales revenue of a company. In the banking sector, inflation is factored in the cost of loans (interest rate). When inflation increases, it becomes costly to borrow and thus reducing interest incomes of banks hence adversely affecting financial performance. Thus, it is expected that inflation will have an inverse relationship with financial performance of commercial banks all other factors kept constant (Sargent, 2013).

### **2.3.3 Interest Rate Spread**

Interest rate is the cost of borrowing funds from lending institutions. Interest rates can either be on deposits or on borrowing (lending). Lending interest rate is the main source of revenue to a bank and often exceeds interest on deposits. The deposit interest is a liability to the bank as it is paid to customers on demand. Thus, all factors kept constant, a rise on interest on lending followed by subsequent drop in interest on deposit would significantly improve financial performance of commercial banks (Indicators, 2014).

### **2.4 Empirical Review**

In Bulgaria, Peshev (2015) investigated factors affecting interest rate spread. The study collected secondary data over a period of 2004 all through to 2014. The study noted that factors affecting interest rate spread are classified into short and long-term. Long term aspects include profit margins, economic activities and market concentrations. Short term factors conversely include rates of unemployment and foreign ownership structure.

Using a case of commercial banks in Pakistan, Ahmed, Rehan, Chhapra and Supro (2018) sought to assess how interest rate and financial performance were interrelated. The study collected secondary data. The collected data covered a seven-year period (2007-2014). Data was collected from twenty commercial banks in Pakistan. These banks were selected on the basis of the relative share in the market and returns. Both correlation and regressions were utilized to examine the collected data. From the findings, interest rates and deposit with other banks are inversely related with commercial banks' profitability. Contrariwise, loans and advances have direct effect on commercial banks' financial performance. However, the investigation was done on the commercial banks in Pakistan which the operating environment might be different in Kenya.

With reference to commercial banks in Oman, Al-Shubiri and Jamil (2017) assessed factors affecting the banking segments' interest rate spread. The study specifically focused on banks listed on Muscat security market. Secondary data covered a period from 2008 all through to 2014. The identified factors were grouped into legal, market, economic and financial factors. All these factors were identified to affect interest rate spread. However, investigation was undertaken on the commercial banks in Oman which the financial operating environment might be different in Kenya.

In Ghana, Mettle (2013) looked at factors affecting interest rate spread among commercial banks. Both explanatory and exploratory approaches were employed in the study. The study relied on secondary data collected using data collection sheets. From the findings, it was revealed that interest rate spread is affected by factors including gross domestic product, rate of exchange, and rate on the treasury bills, profit margins and loss provisions. The study however was limited on determinants of interest rate spread and not how it affected financial performance.

In Zimbabwe, Bonga (2016) empirically examined factors affecting interest rate spread in commercial banks. Panel data methodology was utilized in the investigation. Secondary data was sourced covering the period 2009 to 2015. Data was collected from 5 commercial banks. Random Effects Model was adopted by the study. From the findings, it was documented that macro and industry specific factors are main determinants of interest rate spread amongst commercial banks in Zimbabwe. However, the investigation adopted random effect model on the interest rate spread.



In Rwanda, Rusuhuzwa, Karangwa and Nyalihama (2016) looked at factors affecting interest rate spread among commercial banks. This was an empirical study. The study employed Arellano-Bond dynamic panel data Generalized Method of Moments (GMM) approximation to determine relationship between variables. From the findings, interest rate spread in Rwanda is explained by rates of inflation, operation costs and levels of credit risks. However, the investigation was undertaken on the commercial banks in Rwanda which the financial operating environment might be different in Kenya.

While focusing on both foreign and local banks in Tanzania, Aikoh (2013) investigated factors affecting interest rate spread among commercial banks. The investigation relied on secondary data collected on the period from 2006 to 2012. The collected data was analyzed using regression. From the findings, it was established that the key factors affecting interest rate spread include rates on treasury bills, real interest rates, loss provisions and level of Non-performing loans.

Locally, Mwanzia and Sakwa (2017) analyzed how interest rates spread affected financial performance of listed banks. Key interest rate spread components examined by the investigation included operational costs, liquidity, levels of inflation, market niche of the banks and their conditionalities. The investigation utilized a descriptive research study. A total of eleven listed commercial banks were used as the target population. Data was sources using questionnaires. The findings of the study noted that interest rate spread among commercial banks is explained by industry certain aspects.

Kiplagat (2015) looked at how interest rate spread affected NPLs among Kenyan commercial banks. The investigation utilized a descriptive design. The study involved testing of hypotheses thus correlation design. Secondary data was obtained through data gathering sheets. The collected data was analyzed and the findings suggested that interest rate spread and NPLs are directly and significantly related. This implies that an increase in interest rate spread increases NPLs among commercial banks.

Maina (2015) evaluated factors affecting interest rate spread among Kenyan commercial banks. The study targeted 44 commercial banks. Both primary and secondary data was collected by the researcher. Both stratified and simple random sampling techniques were used in the study. Regression and content analysis were largely performed in analysis of the collected data. From the findings, ownership and market structures besides levels of risk are critical factors affecting interest rate spread among commercial banks. However, the study used sampling design of the commercial banks in Kenya.

Njoroge and Chogii (2017) in a related study evaluated factors resulting into interest rate spread among Kenyan commercial banks. A descriptive design was employed. Commercial banks licensed by CBK embroiled the study population. The research collected secondary data. Analysis was undertaken by way of regression. From the findings, it was established that market structure and interest rate spread had direct and significant relationship. However, the study focused on different control variable of the financial performance of the commercial banks.

Another similar study on factors resulting into interest rate spread among Kenyan commercial banks was done by Njeri, Ombui and Kagiri (2015). The study collected primary and secondary data from relevant sources including CBK reports. In total, 1036 employees in credit departments of the studied banks were targeted. Through stratified random sampling, 103 respondents were selected. The analysis of the collected data indicated that credit risk, level of inflation, liquidity all influence interest rate spread. However, the study focused in other aspects of interest rate spread.

Were and Wambua (2013) similarly assessed key factors affecting interest rate spread among Kenyan commercial banks. The investigation utilized a panel data methodology. The study collected secondary data. Descriptive and regression analysis were employed in processing of data. The analyzed findings suggested that bank specific factors bear significant influence on interest rate spread among commercial banks.

## **2.5 Summary of Literature and Research Gaps**

Table 2.1 summarizes the reviewed studies. The studies are summarized by identifying the author, the topic, the methodologies employed and the key findings. All these aim at pointing out the gaps arising that the current study seeks to fill.

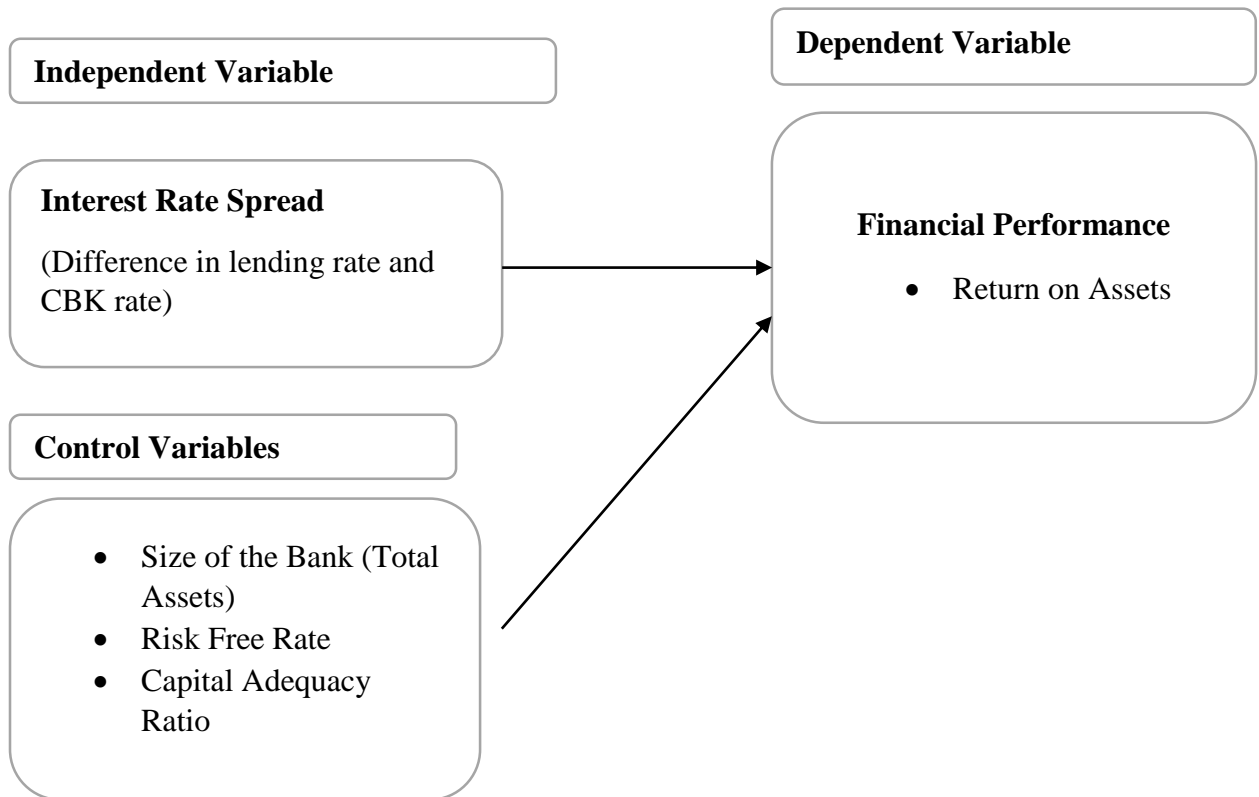
**Table 2.1: Research Gaps**

| <b>Author</b>                            | <b>Study</b>  | <b>Methodology</b>   | <b>Key Findings</b>  | <b>Research Gap</b>   |
|--|---|--|--|---|
| Ahmed, Rehan, Chhapra and Supro (2018)   | How interest rate and financial performance were interrelated             | secondary data; correlation and regressions                                  | Interest rates and deposit with other banks are inversely related with profitability of commercial banks.  | The study was done in Pakistan, limiting its applicability in Kenyan context.                                     |
| Mettle (2013)                            | Factors affecting interest rate spread among commercial banks.            | explanatory and exploratory approaches                                       | Interest rate spread is affected by factors including gross domestic product, rate of exchange, rate on the treasury bills, profit margins and loss provisions | The study only focused on factors affecting interest rate spread and not how this affects financial performance   |
| Rusuhuzwa, Karangwa and Nyalihama (2016) | Factors affecting interest rate spread among commercial banks             | Empirical study  | Interest rate spread in Rwanda is explained by rates of inflation, operation costs and levels of credit risks  | The study specifically examined causes of interest rate spread; nothing on financial performance was covered      |
| Maina (2015)                             | Factors affecting interest rate spread among Kenyan commercial banks.     | primary and secondary data; stratified and simple random sampling techniques | Ownership and market structures besides levels of risk are critical factors affecting interest rate spread among commercial banks                              | The focus was on factors affecting interest rate spread; thus, financial performance ignored                      |
| Njeri, Ombui and Kagiri (2015).          | Factors resulting into interest rate spread among Kenyan commercial banks | stratified random sampling, primary data                                     | Credit risk, level of inflation, liquidity all influence interest rate spread  | The focus was on determinants of interest rate spread; financial performance was ignored                          |
| Kiplagat (2015)                          | How interest rate spread affected NPLs among Kenyan commercial banks.     | descriptive design   | Interest rate spread and NPLs are directly and significantly related   | The investigation examined the link between interest rate spread and NPLs; financial performance was thus ignored |
| Mwanzia and Sakwa (2017)                 | How interest rates spread affected financial performance of listed banks  | descriptive research design  | Interest rate spread among commercial banks is explained by industry specific factors  | The study was limited to only listed commercial banks on NSE and not the entire licensed banks                    |

## 2.6 Conceptual Framework

Figure 2.1 illustrates the research's conceptual framework. It helps in showing relationship between the variables. It points out the research's dependent and independent variables of and the control variable.

**Figure 2.1: Conceptual Framework**



**Source:** Researcher (2018)

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This part presents the design and population of the study. The methods of collecting data as well as analysis are also presented. All these help in achieving the study objectives.

### **3.2 Research Design**

Research design is a framework that leads the researcher during the investigation. A research design goes a long way to determining how data will be collected and analyzed. The investigation will adopt a descriptive study. It is suitable because it will help the researcher to report how interest rate spread has affected financial performance of Kenyan commercial banks.

### **3.3 Population and Sample Size of the Study**

Population is group of items, elements or individuals that have common features. The population in this study will comprise of all commercial banks registered by the CBK There are 43 commercial banks in Kenya that shall be the study population (Appendix I). The researcher will use a census on all these 43 commercial banks and thus no sampling will be done.

### **3.4 Data Collection**

The research will collect secondary data. Data collection sheet will be used to collect data. Secondary data will be collected from financial accounts of respective banks as well as

CBK reports. Information will cover a period of 5 years (2013-2017). This is the most current period where data collection will be easier.

### **3.5 Data Analysis**

It is the process that involves data processing to draw conclusions and deductions. The collected data will be coded in SPSS software. The analysis will be done by way of descriptive as well as inferential statistics. Regression analysis will be employed to verify how interest rate spread has affected commercial banks' financial performance.

#### **3.5.1 Diagnostic Tests**

The study carried out normality, autocorrelation, heteroskedasticity and multicollinearity tests to ensure that the data set does not violate regression assumptions. Normality assessment is done to ascertain whether there is normal distribution of the data set and that is well-modeled by normality of distribution and to determine how probable it is for a random variable fundamental to the data set to have distribution normality. Normality is the likelihood that the data obtained regarding a specific occurrence will have distribution normality over the population sample (Park, 2015). Normality will be tested by Skewness and Kurtosis. Values of between -3 or +3 indicates that the data is normally distributed (Kothari).

Autocorrelation is a data element where the link between the values of similar variables is hinged on associated things. It breaches the statement of instance objectivity that bring about numerous typical models. Autocorrelation mostly is present in those data-sets types where the data, rather than being randomly picked, comes from similar source (Lewis-Beck

& Lewis-Beck, 2015). Autocorrelation will be detected using Durbin Watson Statistics. Values of -2 or +2 suggest that the data set has no autocorrelation.

Heteroscedasticity test is essential in scrutinizing whether a difference exists in residual change of the observation duration to the other observation duration (Godfrey, 2008), and it will be done using Test Glejser where the researcher will regress the total residual amount of the independent variable with the regression equation. If the significance is greater than 0.05, then there is no heteroscedasticity (Busk & Marascuilo, 2015). The researcher will also use Scatter plots to test for Heteroskedasticity. Data points on scatter plots with clearly established patterns will suggest that the data set has heteroskedasticity.

Multicollinearity (collinearity) is an occurrence where a single predictor variable in a multiple regression model could be linearly projected from another with a considerable accuracy level. It is a state where one of the dependent variables in the model is highly related with the independent variable (Pituch & Stevens, 2015). Multicollinearity will be detected using Variance of Inflation Factor (VIF). In essence, VIF values of between 1 and 10 suggest that there is no multicollinearity in the set of information.

### **3.5.2 Analytical Model**

The adopted regression model will take the following form;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where **Y** is = Financial Performance (ROA)

**X<sub>1</sub>** = The interest rate spread (Lending Rate by commercial banks – CBK Rate)

**X<sub>2</sub>** = Risk free rate (Interest rate earned on government bonds and treasury bills)



$X_3$  = Capital adequacy ratio

$X_4$  = Size of the bank assessed by log of total assets

$\beta_0$  = Constant;  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  are Coefficients of the relationship between interest rate spread and Kenyan commercial banks financial performance and  $\epsilon$  = Error Term

### **3.5.3 Test of Significance**

The investigation will use the coefficient of determination R square to examine how change in financial performance of energy and petroleum firms is explained their CSR activities. F test will be performed to examine the overall model's significance in the Analysis of Variance (ANOVA) Table. This will be achieved by comparing the value of F calculated in the ANOVA Table and that F critical from the F Table. T-test will be performed to examine individual implication of the research's predictor variables. The interpretation of p values will be done at 5% significance level.

## **CHAPTER FOUR**

### **RESULTS FINDINGS AND DISCUSSIONS**

#### **4.1 Introduction**

The part tests whether the data meets the conditions set in undertaking a regression analysis by undertaking a diagnostic test. Tests for normality, multicollinearity and autocorrelation are undertaken. The study then carries out a descriptive statistics of the data collected. Pearson's correlation is calculated and F test statistic used to test whether there exists a substantial bearing of interest rate spread on Kenyan commercial banks' financial performance.

#### **4.2 Response Rate**

The study was able to obtain data from 35 commercial banks for the years 2013 to 2017. Some of the commercial banks did not have data for all the five years period indicated and were therefore left out in the study. This represented 83.3% response rate. As stated Mugenda and Mugenda (2003) a 50% response rate is considered good, while 60% or more is considered satisfactory. Hence 83.3% response rate became adequate for the assessment and drawing conclusions from the data therein.

#### **4.3 Data Validity.**

Diagnostics test were undertaken on data in order to determine whether the data obtained was adequate or valid in undertaking a regression analysis. Normality test was undertaken by the use of Kurtosis and skewness. A value of more than 3 for either kurtosis or skewness

suggests that data is not normal and needs transformation for the data to be compatible for a regression test.

### 4.3.1 Normality Test

**Table 4.1: Normality Test**

|                          | Skewness  |            | Kurtosis  |            |
|--------------------------|-----------|------------|-----------|------------|
|                          | Statistic | Std. Error | Statistic | Std. Error |
| Y = ROA                  | -.948     | .184       | 1.477     | .365       |
| X1= Interest Rate Spread | -.060     | .184       | -.806     | .365       |
| X2= Risk Free Rate       | -.155     | .184       | -1.646    | .365       |
| X3 = Capital Adequacy    | 1.371     | .184       | 2.812     | .365       |
| X4 = Size                | .181      | .184       | -1.230    | .365       |
| Valid N (listwise)       |           |            |           |            |

Normality test is done by the use of Skewness and kurtosis as shown in table 4.1, if the value of skewness and kurtosis for any variable goes beyond 3, then the data distribution from which the variable is obtained is considered not normal. In our case all our variables for both skewness and kurtosis are less than 3, and therefore they are considered to be normally distributed.

### 4.3.2: Multi - Collinearity Test

Multicollinearity test on the other hand is determined by the use VIF factor. If the factor is more than 10, then data is considered to be collinear but if the factors for each variable then there is no multicollinearity.

**Table 4.2: Multi-Collinearity Test**

| Model                      | Collinearity Statistics |       |
|----------------------------|-------------------------|-------|
|                            | Tolerance               | VIF   |
| (Constant)                 |                         |       |
| 1 X1= Interest Rate Spread | .866                    | 1.155 |
| X2= Risk Free Rate         | .857                    | 1.167 |
| X3 = Capital Adequacy      | .869                    | 1.151 |
| X4 = Size                  | .874                    | 1.144 |

Source: Author, 2018.

The VIF factors for all the variables are below 10 and therefore, there is absence of multi collinearity in our data variables.

#### 4.4 Descriptive Statistics

Data collected for each variable is described accordingly in form of minimum, maximum, mean as well as standard deviation.

**Table 4.3: Descriptive Statistics**

|                          | N         | Minimum   | Maximum   | Mean      | Std. Deviation |
|--------------------------|-----------|-----------|-----------|-----------|----------------|
|                          | Statistic | Statistic | Statistic | Statistic | Statistic      |
| Y = ROA                  | 175       | -8.0000   | 7.7000    | 2.327143  | 2.7510980      |
| X1= Interest Rate Spread | 175       | 3.0000    | 19.2500   | 9.902714  | 4.1239858      |
| X2= Risk Free Rate       | 175       | 8.2100    | 10.9200   | 9.614000  | 1.0617655      |
| X3 = Capital Adequacy    | 175       | 5.1000    | 59.0000   | 22.554857 | 8.4158558      |
| X4 = Size                | 175       | 8.2188    | 13.2279   | 10.672350 | 1.2964504      |
| Valid N (listwise)       | 175       |           |           |           |                |

Source: Author, 2018

Financial performance was measured by the use of returns on assets. It describes how the commercial banks were able to generate profits from the use of total assets. The average ROA for all the companies was 2.33%, having a standard deviation of 2.75%. The standard deviation is not big enough to show huge disparities for all the commercial banks financial performance. The outliers were a maximum of 7.7% and the minimum was -8%. It therefore shows that as much as we had top performers and those who performed poorly. There was no huge differences between the top performers and the poor performers.

The interest rate spread was evaluated by the difference between the rate of lending for each commercial bank and the CBR rate which is the rate in which commercial banks are able to access credit from the central bank. The average was 9.9% and standard deviation was 4.13%. This shows that the interest rate spread was significant as some commercial banks issued loans at punitive interest rates. The outliers were a maximum of 19.25% and the minimum was 3%.

Risk free rate was determined by the interest charged by government 91 days T bills. It showed the minimum cost of capital that would be required by the commercial banks if they didn't issue loans to the public. The average was 9.61% with a standard deviation of 1.06%. This shows that there existed no huge changes in the government T bills for the entire study period. The outliers were a maximum of 10.92% and the minimum was 8.21%. Capital adequacy was also determined by the core capital over the maximum insured assets for each commercial banks. It shows the assets that have not been secured by the owners' capital. This limit is governed by the CBK. The mean for capital adequacy was 22.55% with a standard deviation of 8.4%. This showed that there were huge disparities among the

commercial banks for capital adequacy. The maximum had 59% and the minimum recorded a capital adequacy of 5.1%.

Size on the other hand was measured by the log of total assets. In this case the total assets that a commercial bank controls dictates whether the company is big or small. The average was at 10.67 with a minimal standard deviation of 1.3. The outliers were 13.22 and 8.22

#### 4.5: Correlation Analysis

**Table 4.4: Correlation Analysis**

|                                     | <i>Y = ROA</i> | <i>X1= Interest<br/>Rate Spread</i> | <i>X2= Risk Free<br/>Rate</i> | <i>X3 = Capital<br/>Adequacy</i> | <i>X4 = Size</i> |
|-------------------------------------|----------------|-------------------------------------|-------------------------------|----------------------------------|------------------|
| <i>Y = ROA</i>                      | 1              |                                     |                               |                                  |                  |
| <i>X1= Interest<br/>Rate Spread</i> | 0.150663203    | 1                                   |                               |                                  |                  |
| <i>X2= Risk Free<br/>Rate</i>       | -0.144698656   | -0.355080704                        | 1                             |                                  |                  |
| <i>X3 = Capital<br/>Adequacy</i>    | -0.069567148   | -0.05116787                         | -0.096106569                  | 1                                |                  |
| <i>X4 = Size</i>                    | 0.596588205    | 0.030042936                         | 0.089992609                   | -0.352729609                     | 1                |

Source: Author, 2018

The table shows a correlation analysis for variables against each other. Variables may either be positively correlated against one another or negatively correlated. Negative correlation mean that increasing a single variable bring about decline in the other variable.

Positive correlations means that increasing a single variable bring about an upsurge in another variable. Pearson's correlation may also be zero showing that when one variable is increased or decreased it has no effect on the other variable. Variables that have values that are near zero are said to have weak correlations, while values closer to one shows strong correlations.

In table 4.4, we consider the correlation of the study variables. Interest rate spread has positive correlation against the dependent variable though the correlation is weak. This means that when the commercial banks increased their interest rate spread, their financial performance increased. Similarly the size of the commercial banks is positively correlated and it is a strong correlation.

The capital adequacy and the risk free rate had negative correlation against financial performance. This could be explained by the fact that increasing the risk free rate, meant that the commercial banks would be enticed to undertake this riskless investment since it has good enough returns instead of taking the risky high returns for the normal lending. This therefore means that the performance of the commercial banks decreases.

#### **4.6 Regression Analysis**

A regression analysis was undertaken to verify the bearing of interest rate spread on Kenyan commercial banks' financial performance.

#### 4.6.1 Regression Summary

The regression summary shows the coefficient of determination (r squared) that shows the extent to which the model predicts changes in the dependent variable.

**Table 4.5: Model Summary**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | .648 <sup>a</sup> | .420     | .406              | 2.1199532                  |

Source: Author, 2018

The coefficient of determination according to table 4.5 shows 42% which is the extent to which the model predicts the dependent variable.

#### 4.6.2 One Way ANOVA

One way Anova table was utilized to undertake F test statistic where it determines whether to discard or retain the null hypothesis accordingly. It also helps in determining whether there is significance effect or not. The null hypothesis of this study is that there exists no bearing of interest spread on Kenyan commercial banks' financial performance. This test is undertaken by comparing the F critical value from the F calculated value in the table 4.6. If the calculated value exceeds the F critical value, then we discard the null hypothesis and declare that there is effect of interest rate spread.



**Table 4.6: ANOVA<sup>a</sup>**

| Model |            | Sum of Squares | df  | Mean Square | F      | Sig.              |
|-------|------------|----------------|-----|-------------|--------|-------------------|
| 1     | Regression | 552.912        | 4   | 138.228     | 30.757 | .000 <sup>b</sup> |
|       | Residual   | 764.014        | 170 | 4.494       |        |                   |
|       | Total      | 1316.926       | 174 |             |        |                   |

Source: Author, 2018.

The Critical F value at alpha of 0.05 and 4 and 170 degrees of freedom is given by 2.3. This shows that the calculated value of F as per table 4.6 is 30.757 which exceeds F critical. We therefore discard the null hypothesis and declare that there is a bearing of interest rate spread on financial performance. We also compare p value from the table is 0.000 with the alpha value of 0.05. The alpha value is greater than p value which points out that the effect is statistically substantial at 5% confidence level.

#### 4.6.3 Regression Coefficients

The regression coefficients helps us to determine the resulting linear model that could be used to predict Y. The coefficient determination for the model was 40% which was a fair model in predicting the Y variable.

**Table 4.7: Coefficients<sup>a</sup>**

| Model | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.   |      |
|-------|-----------------------------|------------|---------------------------|-------|--------|------|
|       | B                           | Std. Error | Beta                      |       |        |      |
| 1     | (Constant)                  | -10.408    | 2.373                     |       | -4.386 | .000 |
|       | X1= Interest Rate Spread    | .057       | .042                      | .085  | 1.350  | .179 |
|       | X2= Risk Free Rate          | -.402      | .164                      | -.155 | -2.459 | .015 |
|       | X3 = Capital Adequacy       | .047       | .020                      | .143  | 2.286  | .024 |
|       | X4 = Size                   | 1.404      | .133                      | .662  | 10.588 | .000 |

Source: Author, 2018

The resulting predicting linear model is given by  $Y = -10.408 + 0.057X_1 - 0.402 X_2 + 0.047 X_3 + 1.404 X_4 + 2.373$

#### **4.7 Interpretation of findings and discussion of results**

The main finding of the investigation was that there was a clear-cut and statistically substantial bearing of interest rate spread on Kenyan commercial banks' financial performance. This means that the increase in financial performance from the increase in interest rate spread is statistically substantial at 5% level of confidence. This could be explained as, increasing the interest rate spread by the commercial banks increase the margin with which they charge their loans. They obtain credit from the Central Bank at a certain rate (CBR rate) and they charge to clients at the lending rate in which case the difference in these two interest rates provides the interest rate spread.

The other outcomes of the investigation was that there was a negative link between the risk free rate and the financial performance. This means that the risk free rate when increased makes the commercial banks increase their investments in the government treasury bills which have lower returns but equally low if not zero risks. It therefore follows that the increase in the risk free rate entices commercial banks to increase investment in these T bills and bonds from the government which reduces their earnings and therefore low financial performance.

This study is consistence with past empirical studies. Peshev (2015) in Bulgaria found similar results to this study, Al-Shubiri and Jamil (2017) found a positive significant relationship in Oman. On the contrary Ahmed et al (2018) found out that the banks in Pakistan had inverse relationship of interest rates and deposits. In Ghana, Mettle (2013) found the interest rate spread affected financial performance negatively.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATION**

#### **5.1 Introduction**

This part summarises the results and findings of the study, makes inferences from this outcomes and generates commendations from the conclusions. It similarly underlines the study limitations and makes propositions for further investigation.

#### **5.2 Summary of Result Findings**

The investigation intended to look at the bearing of interest rate spread on financial performance of commercial banks in Kenya. The interest rate spread was found by looking at the lending rate of the commercial bank less the CBR rate. With the capping of the interest rates in 2016, this has meant that the interest rates spread has reduced significantly, thereby reducing financial performance among the commercial banks. The issue has elicited interests among the top commercial banks, the CBK as well as the parliament as they seek to review these laws.

The study found that the bearing of interest spread on Kenyan commercial banks' financial performance was positive and statistically significant. The correlation analysis was positive though it was a weak correlation. However, the study overruled the null hypothesis and the alpha value was exceeding the p value which showed that the effect was significant at 95% degrees of freedom.

Data was first assessed for normality, presence of collinearity and autocorrelations. The variables passed these tests and as such a linear regression analysis could be undertaken on the data collected. The correlation analysis that was conducted showed that the interest rate spread was absolutely linked and the size of the commercial bank which meant that increasing the bank size resulted to increasing the financial performance of the commercial bank. The risk free rate on the other hand had negative correlation which meant that increasing the risk free rate enticed commercial banks to invest in the treasury bills and therefore didn't consider lending out normal loans which were risky but had better returns.

### **5.3 Conclusions**

The investigation made various conclusions from the outcomes. The study made the basic significant conclusion that interest rate spread led to increase in commercial banks' financial performance. This was expounded as, increase in interest rates spread led to increase in the margin that the banks receive which means that it would improve the financial performance of the commercial bank.

We also make a conclusion that growth in the size of the commercial banks leads to upsurge in financial performance. This could be expounded as, commercial banks are grouped according to tiers which are based on size of the bank. Tier one banks is made up of high end commercial banks that means that they enjoy from economies of scale. This means that they can make savings owing to economies of scale as well as huge discounts that comes with getting services in bulk. Big commercial banks also earn the trust of customers since it is perceived that they may not go under with ease as compared to small banks.

The other conclusion made by the study is that risk free interest rate negatively affects financial performance of the commercial banks. This is explicated by the fact that if the risk free rate is increased by the government, commercial banks would prefer investing in the riskless treasury bills than issuing normal loans at higher returns but high risks. The management therefore finds it cumbersome to make the decision of issuing more normal loans instead of taking advantage of the increased risk free rate and invest in the riskless investment.

#### **5.4 Recommendations**

The study draws its recommendations from the conclusions made by the study. One of the recommendation is that the management of the commercial banks should actively monitor and set appropriate lending rate for the loans they issue. This is because the lending rate affects the interest rate spread which eventually leads to an increase in commercial banks' financial performance.

The investigation also recommends commercial banks' management to ensure that they make minimal investment in government treasury bills, as investment in such bills reduces the commercial banks' financial performance. The commercial banks' management should ensure that they undertake an analysis of their total risk profile so as to ensure that they take the investments that provide increased returns but at manageable risks.

The government should also reduce their borrowing from the local market. This is because the government increases the risk free interest rates, when they need to borrow from the public. This means that the commercial banks rushes to lend to the government and ignores

the general public, which might mean a counter-productive measure as the output in form of GDP by the citizens reduces if the public is unable to access loans from the commercial banks to undertake their investments.

### **5.5 Limitations of the Study**

There are several shortcomings met in undertaking this investigation. First of all the study relied on secondary data that was obtained from secondary sources. These sources are websites from CBK and individual bank's websites. The data collected may be prone to errors of omissions, round off errors among others. Primary data collection methods may have less of such errors as it would be easier to authenticate the truthfulness of data collected or observed.

The study only used three control variables. Perhaps if the study applied more control variables, the results would have been different from the results observed. The variables employed were interest rate spread, capital adequacy and size of the commercial banks.

Data was also collected for the years 2013 to 2017. This period did not have much turbulences in form of economic growth or calamities affecting the country. The study period therefore might have limited us to make the conclusions in this study. A different study period may give different results.

## **5.6 Suggestions for Further Research**

The investigation makes various suggestions that would be useful to future researchers and also in improving the findings and information on lending rate as well as loan performance for commercial banks. For instance the investigation would suggest that a similar study should be undertaken for longer period of time such as the last twenty years. The results of that study would be matched with this investigation's outcomes.

Another suggestion is that the researcher might consider collecting both secondary data and primary data in form of making observations or questionnaires that would ascertain the information collected through secondary sources. The results for that study would also be compared to the results in this study. Future researcher should also make budgetary provisions that would allow for unexpected costs, such as the costs for obtaining crucial data and information. It would help in ensuring that the right information is obtained in good time to allow for analysis of data collected and making conclusions and recommendations.

A similar study would also be undertaken in another third world country and the outcomes matched with this investigation's outcomes. A study in a middle income generating country should also be undertaken and results compared to results in this study.

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## APPENDICES

### Appendix I: List of Banks Licensed By CBK

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

Source: (Central Bank of Kenya, 2018)

## Appendix II: Data Collection Sheet

| <b>Year</b> | <b>Interest on lending</b> | <b>CBK Rate</b> | <b>Interest Rate earned on government bonds (Risk free rate)</b> | <b>Capital Adequacy Ratio</b> | <b>Asset Base</b> | <b>Net Profit</b> |
|-------------|----------------------------|-----------------|--|-------------------------------|-------------------|-------------------|
| 2017        |                            |                 |  |                               |                   |                   |
| 2016        |                            |                 |  |                               |                   |                   |
| 2015        |                            |                 |  |                               |                   |                   |
| 2014        |                            |                 |  |                               |                   |                   |
| 2013        |                            |                 |  |                               |                   |                   |

### Appendix III: Data Collected

| Y =<br>ROA | X1=<br>Interest<br>Rate<br>Spread | X2= Risk<br>Free<br>Rate | X3 =<br>Capital<br>Adequacy | X4 = Size |
|------------|-----------------------------------|--------------------------|-----------------------------|-----------|
| 5.5        | 12.25                             | 8.21                     | 22.5                        | 12.68637  |
| 7.7        | 14.25                             | 8.21                     | 23.6                        | 12.38084  |
| 4.7        | 13.25                             | 8.21                     | 21.1                        | 12.34093  |
| 5.8        | 9.25                              | 8.21                     | 17.3                        | 12.24052  |
| 6          | 13.25                             | 8.21                     | 20.8                        | 12.30376  |
| 4.1        | 10.25                             | 8.21                     | 21                          | 12.04782  |
| 4.9        | 11.25                             | 8.21                     | 21                          | 11.64515  |
| 5.5        | 10.25                             | 8.21                     | 19                          | 11.6111   |
| 4.6        | 9.25                              | 8.21                     | 14.8                        | 11.63441  |
| 7          | 10.25                             | 8.21                     | 35.4                        | 11.17385  |
| 3.6        | 13.25                             | 8.21                     | 13.5                        | 11.73512  |
| 4          | 13.25                             | 8.21                     | 18.9                        | 10.68054  |
| 4.8        | 9.25                              | 8.21                     | 21.6                        | 10.85942  |
| 1.9        | 12.25                             | 8.21                     | 24.1                        | 11.43489  |
| -3.3       | 10.25                             | 8.21                     | 30.6                        | 10.51616  |
| 3.8        | 9.25                              | 8.21                     | 18.4                        | 10.80894  |
| 2          | 10.25                             | 8.21                     | 12.7                        | 10.87205  |
| 4.1        | 10.25                             | 8.21                     | 41.5                        | 10.3327   |
| 1.6        | 9.25                              | 8.21                     | 33.8                        | 10.15183  |
| 2.7        | 9.25                              | 8.21                     | 18.1                        | 9.683713  |
| 4.2        | 19.25                             | 8.21                     | 21.4                        | 9.487896  |
| 4.3        | 6.25                              | 8.21                     | 19.8                        | 9.521055  |
| 4.3        | 12.25                             | 8.21                     | 33.2                        | 9.306468  |
| 1.3        | 19.25                             | 8.21                     | 25.8                        | 8.855093  |
| 2.9        | 9.25                              | 8.21                     | 15.1                        | 9.885273  |
| 2.5        | 16.25                             | 8.21                     | 30.4                        | 8.854665  |
| 3          | 9.75                              | 8.21                     | 18                          | 9.459931  |
| 2.3        | 11.25                             | 8.21                     | 31.4                        | 9.175542  |
| 1.8        | 8.75                              | 8.21                     | 23.6                        | 9.653808  |
| 1.8        | 15.25                             | 8.21                     | 14.8                        | 9.333     |
| 1.2        | 12.25                             | 8.21                     | 41.9                        | 8.990815  |
| 1          | 16.25                             | 8.21                     | 26.6                        | 8.896862  |
| 1.4        | 7.25                              | 8.21                     | 36.3                        | 8.659734  |
| -7.5       | 11.25                             | 8.21                     | 46.9                        | 8.218787  |
| -0.8       | 11.25                             | 8.21                     | 10.8                        | 9.727883  |

|       |        |       |      |          |
|-------|--------|-------|------|----------|
| 5.93  | 12.5   | 8.58  | 21   | 12.83992 |
| 7.26  | 14.5   | 8.58  | 17.7 | 12.53219 |
| 4.43  | 13.5   | 8.58  | 21.6 | 12.5521  |
| 5.44  | 9.5    | 8.58  | 18.7 | 12.32848 |
| 6.42  | 13     | 8.58  | 19.8 | 12.31329 |
| 4.31  | 11.5   | 8.58  | 22   | 12.05145 |
| 4.47  | 11.5   | 8.58  | 18.9 | 11.85776 |
| 5.64  | 10.5   | 8.58  | 18.9 | 11.82992 |
| 4.44  | 8.5    | 8.58  | 20.9 | 11.82837 |
| 5.22  | 13.5   | 8.58  | 27.3 | 11.28223 |
| 2.57  | 14.5   | 8.58  | 17.9 | 12.07715 |
| 4.24  | 14.5   | 8.58  | 20.3 | 11.03187 |
| 4.35  | 9      | 8.58  | 24.2 | 11.034   |
| 1.9   | 12.5   | 8.58  | 13.9 | 11.71884 |
| -1.09 | 10.5   | 8.58  | 19.8 | 10.73498 |
| 4.18  | 10     | 8.58  | 16.8 | 10.9136  |
| 0.33  | 9      | 8.58  | 15.9 | 11.0383  |
| 3.74  | 10.5   | 8.58  | 39.4 | 10.44494 |
| 2.08  | 11.5   | 8.58  | 25.9 | 10.40402 |
| 3.11  | 9.5    | 8.58  | 13.5 | 9.891111 |
| 4.61  | 19     | 8.58  | 20.6 | 9.667702 |
| 3.68  | 5      | 8.58  | 19.2 | 9.75522  |
| 5.29  | 9.5    | 8.58  | 37.2 | 9.404838 |
| 0.73  | 15.5   | 8.58  | 26.1 | 9.481741 |
| 1.49  | 8.5    | 8.58  | 17.2 | 9.972967 |
| 1.07  | 15.5   | 8.58  | 25.6 | 8.969287 |
| 2.59  | 10     | 8.58  | 16.6 | 9.586789 |
| 1.86  | 14     | 8.58  | 21.7 | 9.234057 |
| 1.88  | 9      | 8.58  | 29.6 | 9.738259 |
| 0.67  | 15     | 8.58  | 11.5 | 9.634169 |
| 1.32  | 12.5   | 8.58  | 25.5 | 9.249753 |
| -1.02 | 17.5   | 8.58  | 18.8 | 9.089866 |
| 1.28  | 7      | 8.58  | 33.7 | 8.688959 |
| -6.97 | 9.5    | 8.58  | 58.6 | 8.467162 |
| -1.82 | 12.5   | 8.58  | 11   | 9.620926 |
| 5.01  | 10.875 | 10.92 | 15.4 | 13.05567 |
| 6.56  | 13.875 | 10.92 | 16.2 | 12.7406  |
| 4.14  | 11.375 | 10.92 | 21.3 | 12.73538 |
| 5.01  | 7.375  | 10.92 | 18.4 | 12.39319 |
| 3.83  | 14.875 | 10.92 | 21.2 | 12.36364 |
| 3.56  | 12.375 | 10.92 | 18.7 | 12.19894 |

|       |        |       |      |          |
|-------|--------|-------|------|----------|
| 3.69  | 11.875 | 10.92 | 17.7 | 12.15976 |
| 5.66  | 9.875  | 10.92 | 19.2 | 11.90393 |
| 3.99  | 9.875  | 10.92 | 20.5 | 11.96248 |
| 6.33  | 15.875 | 10.92 | 28.3 | 11.38676 |
| 3.14  | 13.375 | 10.92 | 17.9 | 12.19846 |
| 3.55  | 13.875 | 10.92 | 18.9 | 11.30455 |
| 3.65  | 9.875  | 10.92 | 27.1 | 11.12988 |
| -1.34 | 12.875 | 10.92 | 14   | 11.73843 |
| 0.18  | 12.375 | 10.92 | 25   | 10.86718 |
| 3.99  | 9.875  | 10.92 | 17.3 | 11.08216 |
| -2.07 | 7.375  | 10.92 | 16.4 | 11.14591 |
| 1.86  | 8.875  | 10.92 | 42.3 | 10.6493  |
| 1.86  | 11.875 | 10.92 | 27.7 | 10.28787 |
| 4.42  | 10.875 | 10.92 | 15.8 | 10.11513 |
| 2.72  | 17.875 | 10.92 | 24.7 | 9.85781  |
| 3.38  | 4.875  | 10.92 | 19.3 | 9.904487 |
| 3.53  | 7.375  | 10.92 | 26.9 | 9.577757 |
| 0.22  | 12.875 | 10.92 | 16.3 | 9.728062 |
| 1.61  | 6.375  | 10.92 | 16.5 | 10.00143 |
| 0.49  | 13.875 | 10.92 | 34.2 | 9.047351 |
| 2.25  | 13.375 | 10.92 | 17.6 | 9.589393 |
| 2.39  | 11.375 | 10.92 | 21.5 | 9.262268 |
| 1.05  | 8.375  | 10.92 | 27.3 | 9.73761  |
| 0.07  | 11.875 | 10.92 | 15.3 | 9.589667 |
| 1.6   | 11.875 | 10.92 | 24.1 | 9.261604 |
| -1.74 | 17.875 | 10.92 | 15.7 | 9.238636 |
| 0.75  | 5.375  | 10.92 | 33.1 | 8.644354 |
| -3.91 | 7.875  | 10.92 | 23.8 | 8.95944  |
| 0.35  | 10.375 | 10.92 | 9.4  | 9.55648  |
| 5.64  | 11.5   | 9.85  | 19.9 | 13.13187 |
| 6     | 13     | 9.85  | 15.5 | 12.84727 |
| 5.15  | 14.1   | 9.85  | 22.8 | 12.76568 |
| 4.02  | 7.5    | 9.85  | 17.9 | 12.4665  |
| 5.1   | 15.5   | 9.85  | 20.9 | 12.43031 |
| 3.37  | 13     | 9.85  | 18.5 | 12.23025 |
| 3.64  | 13.5   | 9.85  | 18.5 | 12.40543 |
| 5.27  | 12.5   | 9.85  | 18.1 | 12.00833 |
| 3.66  | 12     | 9.85  | 21.6 | 11.99441 |
| 5.84  | 15.5   | 9.85  | 26.4 | 11.54562 |
| 3.6   | 13.5   | 9.85  | 18.4 | 12.25904 |
| 0.91  | 15.5   | 9.85  | 20.8 | 11.1481  |



|       |      |       |      |          |
|-------|------|-------|------|----------|
| 4.67  | 9.5  | 9.85  | 30.5 | 11.32547 |
| 0.14  | 12.5 | 9.85  | 11.9 | 11.65368 |
| -6.13 | 12.5 | 9.85  | 19.4 | 10.76054 |
| 3.57  | 12.5 | 9.85  | 22.2 | 11.08733 |
| -0.03 | 7.5  | 9.85  | 16.2 | 10.93304 |
| 4.57  | 8.5  | 9.85  | 45.7 | 10.77509 |
| 2.23  | 12.5 | 9.85  | 27.1 | 10.29617 |
| 2.78  | 10.5 | 9.85  | 18.7 | 10.20935 |
| 0.3   | 16   | 9.85  | 23.2 | 9.946308 |
| 3.55  | 5.5  | 9.85  | 25.5 | 10.01695 |
| 3.65  | 7    | 9.85  | 32.3 | 9.742908 |
| -3.12 | 11.5 | 9.85  | 20.1 | 9.662943 |
| 0.99  | 6    | 9.85  | 16   | 10.0178  |
| 0.36  | 14.5 | 9.85  | 38.7 | 9.202308 |
| 2.05  | 11   | 9.85  | 19.6 | 9.595943 |
| 1.53  | 8    | 9.85  | 20.8 | 9.255792 |
| 0.58  | 6.5  | 9.85  | 25.1 | 9.706134 |
| -0.28 | 13   | 9.85  | 14   | 9.613269 |
| 1.11  | 11.5 | 9.85  | 27.4 | 9.151333 |
| 1.3   | 17.5 | 9.85  | 22.8 | 9.409355 |
| -1.93 | 4.5  | 9.85  | 31.6 | 8.562931 |
| 0.89  | 7    | 9.85  | 38.7 | 8.6307   |
| -1.99 | 10   | 9.85  | 7.9  | 9.540938 |
| 4.94  | 4    | 10.51 | 16.1 | 13.22786 |
| 5.68  | 4    | 10.51 | 16.5 | 12.9151  |
| 4.31  | 4    | 10.51 | 22.7 | 12.85535 |
| 3.68  | 4    | 10.51 | 18   | 12.51239 |
| 3.34  | 4    | 10.51 | 18.5 | 12.56068 |
| 2.34  | 4    | 10.51 | 17.6 | 12.38592 |
| 3.05  | 4    | 10.51 | 19   | 12.50648 |
| 4.09  | 4    | 10.51 | 18.6 | 12.12244 |
| 2.94  | 4    | 10.51 | 19.9 | 12.1695  |
| 6.49  | 4    | 10.51 | 25.6 | 11.49509 |
| 3.13  | 4    | 10.51 | 17.3 | 12.34377 |
| -1.99 | 4    | 10.51 | 19.9 | 11.1426  |
| 5.26  | 4    | 10.51 | 32.3 | 11.47348 |
| 0.67  | 4    | 10.51 | 5.4  | 11.60771 |
| -2.68 | 4    | 10.51 | 16   | 10.88661 |
| 2.59  | 4    | 10.51 | 22.5 | 11.24424 |
| 0.06  | 4    | 10.51 | 15.8 | 10.90027 |
| 4.72  | 4    | 10.51 | 54   | 10.94431 |

|       |     |       |      |          |
|-------|-----|-------|------|----------|
| 0.87  | 4   | 10.51 | 26.9 | 10.22659 |
| 0.81  | 4   | 10.51 | 15.8 | 10.35188 |
| -3.28 | 4   | 10.51 | 16.5 | 9.867964 |
| 3.27  | 4   | 10.51 | 22.7 | 10.16527 |
| 2.19  | 4   | 10.51 | 27.1 | 9.836707 |
| -5.93 | 4   | 10.51 | 19.3 | 9.461177 |
| 0.82  | 3   | 10.51 | 15.1 | 10.11876 |
| 1.1   | 4   | 10.51 | 33.9 | 9.266437 |
| 1.44  | 3   | 10.51 | 20.2 | 9.667955 |
| 0.52  | 3   | 10.51 | 30.2 | 9.239414 |
| 0.35  | 3   | 10.51 | 23.6 | 9.700147 |
| 1.25  | 4   | 10.51 | 15.3 | 9.761924 |
| 1.01  | 4   | 10.51 | 27.4 | 9.163354 |
| 1.24  | 3   | 10.51 | 15.9 | 9.579487 |
| -0.81 | 3.5 | 10.51 | 42.6 | 8.541105 |
| 0.21  | 3.5 | 10.51 | 38.8 | 8.780326 |
| -3.26 | 3.5 | 10.51 | 5.1  | 9.50718  |