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**INFLUENCE OF INTEREST RATES DETERMINANTS ON THE
QUALITY OF CREDIT PORTFOLIO OFFERED BY COMMERCIAL
BANKS IN KENYA**

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ADMISSION NO. 58422



**A Research Dissertation Submitted to the Strathmore University Business
School in Partial Fulfilment for the Degree of Master of Science in
Development Finance of Strathmore University**

November, 2020

DECLARATION

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

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ABSTRACT

The quality of credit portfolio influences the ability of commercial banks to lend to its customers in a sustainable manner. While managing the quality of credit portfolio for commercial banks remains a challenge, the issuing of loans and advances is critical to most commercial banks' performance around the globe. Interest rates determinants affect the quality of credit portfolio offered by commercial banks. The main objective of this study is to analyse the influence of interest rates determinants on the quality of credit portfolio offered by commercial banks in Kenya. The study sought to answer the questions on whether interest rates determinants of total savings, cost of savings, operational costs and capital adequacy influence the quality of credit portfolio offered by commercial banks in Kenya. The study was guided by the Loanable fund's theory, Keynes liquidity theory and Classical theory of interest. The positivist research philosophy was used for this study and a causal research design is adopted. Quantitative data was extracted from the financial statements of commercial banks for the period ranging from 2009 to 2018 with the population covering 40 commercial banks. The data was analysed using descriptive and inferential statistics which included mean, standard deviation, regression analysis. The findings of the study indicate that interest rates determinants of total of savings, cost of savings, capital adequacy and operational costs have a significant influence on quality of credit portfolio offered by commercial banks in Kenya. The study found out that among the interest rates determinants, capital adequacy had the greatest effect on the quality of credit portfolio offered by commercial banks in Kenya, followed by total savings then operational costs while cost of savings had the least effect to the quality of credit portfolio offered by commercial banks in Kenya. The study 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. The study recommended banks should increase the amount of core capital since measure of capital adequacy showed that banks with high capital adequacy ratios perform better financially.

Keywords: Credit Portfolio, Interest Rates, Total of Savings, Cost of Savings, Capital Adequacy, Operational Costs, Commercial Banks

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ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
APR	Annual Percentage Rate
CBK	Central Bank of Kenya
DW	Durbin Watson Test
EDF	Empirical Distribution Function
FinTech	Financial Technology
FSD	Financial Sector Deepening
GDP	Gross Domestic Product
KBA	Kenya Bankers Association
KNBS	Kenya National Bureau of Statistics
K-S	Kolmogorov-Smirnova Test
LLP	Loan Loss Provisions
LLR	Loan Loss Reserves
MFI	Micro Finance Institutions
NACOSTI	National Commission for Science and Technology
NPL	Non - Performing Loans
SME	Small Medium Enterprises
SMS	Short Message Services
SSA	Sub Saharan Africa
S-W	Shapiro-Wilk Test
USA	United States of America
VIF	Variance Inflation Factor



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DEFINITION OF TERMS

Total Savings – Total Savings according to Keynesian economics refers to balances left from disposable income after expenditure is incurred. Total savings can be defined as the funds placed by customers with commercial banks in the form of normal savings or fixed deposits. Savings are the main backbone of the private sector credit with its growth levels depended on interest rate, economic growth, inflation, remittance inflows and money in flow (Olokoyo, 2011).

Capital Adequacy - Capital adequacy is the statutory minimum reserves that financial institutions hold to meet the immediate debts and absorb shocks in the business operations (Sentero, 2012). It is used as a reserve of contingent funds which can provision for bad and doubtful debts. Capital adequacy requirements determine the level of capital that a bank can deploy to vehicles that will generate income to an organisation.

Cost of Savings - Cost of savings constitute the interest expense that is paid to a depositor (Dupas, 2017). Cost of savings can also be referred to as interest expense on borrowings. Most financial institutions borrow money at cost to on lend to their customers thereby incurring expenses for such amounts of money.

Operational Costs - Operational costs relate to the expenses that are associated with the operations of a business. They are associated with maintenance and administration of a business on a day to day basis (Simpasa, 2014).

Credit Portfolio - Credit portfolio refers to any collection of credit exposures that is formed as part of financial intermediation activities such as regular Lending products or derivative contracts or as an investment in Credit Risk sensitive securities such as corporate bonds. Credit portfolio of a bank is the main asset in a commercial bank's balance sheet asset and the predominant source of revenue for them (Kenton, 2017).

Quality of Credit Portfolio – Quality of Credit Portfolio is the creditworthiness or risk of default of the portfolio of a financial institution. Financial institutions determine their quality of credit portfolio using several indicators among them non-performing loans, loan loss provisions and loan loss reserves (Bredl, 2018).

Commercial Banks - Commercial banks can be defined as financial institutions which perform the role of accepting deposits from the public and giving loans for investment at a

profit. The main role of commercial banks is to provide general financial services to the public and business, ensuring economic and social stability and sustainable growth of the economy (Collins, 2011).

Interest Rates – Interest rates can be defined as the amount of money a lender charges to a borrower for the use of assets expressed as a percentage of the principal. It can also be defined as the proportion of an amount loaned which a lender charges as cost to the borrower, normally expressed as an annual percentage. It is the rate a bank or other lender charges to borrow its money, or the rate a bank pays its savers for keeping money in an account (Krnck, 2011).



DEDICATIONS

This work is dedicated to both my parents for motivating, inspiring and relentlessly encouraging me to go on and complete the Master of Science in Development Finance degree. They never wavered in encouraging us to work hard.



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CHAPTER ONE: INTRODUCTION

1.1. Background of the Study

The banking sector is one of the main pillars of a country's financial engine and therefore serves as a crucial enabler of both economic and social development (Islam, 2019). It provides financial intermediation by providing mechanisms for transfer and allocation of resources within the market. Kenya's GDP growth is driven by credit growth and therefore increased financial deepening, results to increased economic growth (Rose, 2003). The Kenyan financial system has undergone significant tests by both internal and external shocks such as the post-election violence in 2007, the contagion effects from the global financial crisis of 2010, price volatility in the international commodities and the general decrease in the global growth outlook. Kenyan government through its vision 2030 blueprint aims to reduce the share of population without access to finance from 85% to below 70% (CBK, 2015). Commercial banks and financial institutions are responsible for mobilization of savings, risk diversification, risk pooling and allocation of resource. They mobilize economic resources from surplus economic units to deficit economic units. They act as a bridge or a link between savers or depositors and borrowers of funds for economic use (Bhattarai, 2015).

Credit risk is one of the greatest risks for commercial banks because it contributes to adverse effects on their earnings, profitability, and capital levels through losses attributable to bad and doubtful debts (Skinner, 2018). Consequently, regulatory agencies and financial institutions usually prioritizes the measurement and management of credit risk especially through continuous monitoring of the quality of the credit portfolio in the balance sheet. This is particularly imperative especially in the current recessionary economic environment because commercial banks' loan portfolio quality has been gradually deteriorating. The most widespread indicator used to define quality of credit portfolio is the ratio of non-performing loans (NPL) against the total loans outstanding. According to global best practice, non-performance often implies that a loan is overdue for more than 90 days (Krnck, 2011)

Interest rates is the cost charged by a financier or moneylender to a borrower for use of funds (Mutinda, 2014). Banks are one the financial institutions that have the greatest exposure in the financial markets industry to variations in interest rates. This is because a change in the level of the interest rate in the financial markets is always reflected on banks' lending rate and interests on deposits. High interest rates make borrowing becomes more expensive and therefore dampens consumer demand for loan products (Kamuyu, 2013). Low lending

interest rates are desirable mainly because they usually tend to have a positive effect on new and existing investments, they advance competitiveness of Kenya's businesses and it contributes to growth and development of the country. These positive welfare effects often lead to higher living standards and financial surpluses. On the other hand, developed economies have shown that profits for commercial banks tend to rise as interest rates increase (Kanyuru, 2013).

Loan advances or credits are the dominant assets for banks because they generate interest income over a period of time (Mokaya, 2015). However, this is may not always be the case because some loans do not always perform as required and are characterized as non-performing loans (NPL). Distress in loan repayment maybe caused by the unexpected economic shocks in the life cycle of a loan or through an economic or banking crisis. Kalani (2009) confers that crises do not always happen without a warning. The most ideal warning sign of an impending financial crises is the proxies for vulnerability in the banking and corporate sector. Key evidential indicators used to envisage a banking crisis relate directly to non-performing loans (Kalani, 2009). This is a predictive indicator as it enables commercial banks loan loss reserves which measure the quality of portfolio it holds.

1.1.1. Lending Interest Rates Determinants

Interests rates is the cost charged by a financial institution to a borrower for the use of borrowed money, typically expressed in annual percentage rate (APR) of the principal amount with the rate relying upon several factors like credit risk of the borrower, inflation rate and time value of money among others (Dupas, 2017). Money in monetary value is considered an asset used as a store of value and an accepted medium of exchange. Lenders expect a form of compensation for providing capital to borrowers over a specified time frame. This can be described as interest rate which acts to compensates credit risk. The rate of interest usually covers credit risk exposure that lenders face. Therefore, interest rate is the cost that borrowers pay for the borrowed capital over a specific period of time (Ngele, 2013).

Lending rates that are charged by commercial banks may be affected by several elements. The classical theory of interest rates maintains that interest rates is determined by several factors that includes savings supply which comes mainly from households, demand for investable capital that is derived mainly from the business sector and capital adequacy that is expected to absorb economic shocks that arise during operations (Rose, 2003). Loanable funds theory in contrast contemplates that the rate of interest is the function of four factors

that include investment, savings, the supply of money and the desire to hoard it. Rational expectation theory states that the best estimate for future interest rates is the current spot rate and therefore variations in interest rates is largely because of unexpected change of information provided or fluctuations in economic factors (Irungu, 2012).

Setting of interest rate by banks can be categorized into two broad classifications namely microeconomic factors that consist of bank-specific variables and macroeconomic factors that consist of market specific variables (Kaakunga, 2014). At micro level or the bank specific level, these include variables such as total savings, cost of savings, operating costs, and capital adequacy in relation to bank assets. On the other hand, at the macroeconomic level, variables such as the rate of inflation, exchange rate volatility, borrowings by the public sector from commercial banks (crowding out effect) fiscal deficit, and the pace of economic growth are the key determinants (Bhattarai, 2015).

Interest rate levels are a factor of the supply and demand of credit the supply and demand of credit (Bean, 2017). The main direct factors of interest rate relate more to the liquidity levels for commercial banks in terms of availability of funds, cost of funds, capital levels and operational cost. Research done by Kaakunga (2014) indicates that bank specific variables are more important determinants of interest rates as they relate to the operations of the bank. Hence this study majorly focused on bank specific variables that influence of interest rates determinants on credit portfolio offered by commercial banks in Kenya. These variables include total savings, cost savings, capital adequacy and operational costs. These determine the amount of interest rate that need to be imposed on credit.

Savings are monies placed by clients of banks in the manner of normal savings or fixed deposits (Olokoyo, 2011). Savings are the main pillar for private sector credit with its level of growth depended on inflation, economic growth, interest rate, remittance inflows and money in flow (Olokoyo, 2011). Deposits that constitute customer savings are usually the cheapest source of funds that banks use to lend to their clients. Commercial banks use these funds to enhance the rate of return by maximizing profitability particularly when the demand for loans is at its peak. Therefore, high levels of deposits or savings allow banks provide more loans and increase their revenue resulting in higher interest income. Efficient banking systems is beneficial to the real economy. Offering superior returns to savers and lowering the cost of borrowing to potential borrowers and investors will have substantial impact in an economy (Dupas, 2017).

Capital reserves are mostly used as a contingent fund which can cushion against losses expected from bad and doubtful debts. Capital adequacy is the statutory required minimum reserves that are held by financial institutions to meet the immediate debts and absorbs shocks in the business operations (Sentero, 2012). According to Lotto (2018) capital adequacy not only underpins the financial strength of commercial banks by providing a larger capital mitigation against losses, but it also enhances their operating efficiency by averting moral hazard problems between shareholders and debtholders. Nzioki (2011) opines that the levels of capital, ratio of borrowings as contrasted to customer deposits and credit to deposit ratio signifies the soundness of a bank and that the capital base of a financial institution enables the depositors to form the risk perception about the institution.

According to Dupas (2017) cost of savings constitutes the interest expense that is paid to a depositor. It can also be referred to as interest expense on borrowings. Most financial institutions borrow money at cost to on lend to their customers thereby incurring expenses for such amounts of money. High cost of savings means an increased inherent interest of loans charged to consumers which has an overall effect on the non-performing loans.

Operational costs for banks relate to the expenses that are associated with the operations of a business which include maintenance and administration of a business on a day to day basis. Simpasa (2014) deduced from his study that the rate of lending is to a substantial extent affected by factors relating to the costs of banks. He went on to state that elements of a financial institution's balance sheet show that the rate of lending are to a substantial extent positively affected by factors associated with high cost structures or low income. Efficiency Market Hypothesis EMH indicates that achieving lower cost of production enables financial institutions to offer loans/credits at reasonable and affordable costs. Affordable cost has an overall impact in the reduction in levels of non-performing loans and therefore it impacts on the quality of credit portfolio held by commercial banks.

Thompson (2006) avows that commercial banks can establish their rate of lending rate according to a certain benchmark relative to the current rate of deposit. One key factor influencing lending interest rate is the cost of funding, which is a sum function of the total structure of liabilities and the total costs of raising the different liabilities. Policy makers state that there is an inclination for banks to elevate their rate of lending swiftly more so when the market interest rates are rising, in comparison to the swiftness at which they are set to lower their lending rates when the market rates are declining (Dupas, 2017). This study will focus

on total savings, cost savings, capital adequacy and operational costs as they are the main determinants of interest rates in Kenya.

1.1.2. Quality of Credit Portfolio Offered by Commercial Banks

Credit portfolio refers to an assortment of credit exposures which is designed as a key element of financial intermediation activities such as regular lending operations, contracts relating to derivatives or as an investment in high credit risk sensitive securities that include corporate bonds (Skinner, 2018). Credit portfolio of a bank is the main asset in a bank's balance sheet and the most predominant revenue source for them. It is one of the highest sources of risk to a commercial bank's safety and soundness. Interest rate risk levels accredited to a bank's lending activities is dependent on the structure of its credit portfolio and the degree to which the terms of its loans such as rate structure, maturity term, and other embedded options may expose the core bank's revenue stream against changes in rates (Islam, 2019)

The primary economic activity for most banks involves lending money to borrowers. According to Business Dictionary (2018), credit portfolio can be defined as the entire amount of loans held by a financial institution such as a bank on any given day. Credit portfolios constitute the main assets for commercial banks, Micro Finance Institutions (MFI), and other financial institutions. It is the prime source of revenue for commercial banks in Kenya as it generates interest income. The quality of a good credit portfolio is dependent not only on the interest income generated from the loans, but on the ability of both interest and principal to be recovered in full. Therefore, it is one of the highest sources of risk to a bank's safety and soundness. Interest risk levels credited to a bank's lending activities is dependent on the composition of its credit portfolio and the degree to which the terms of its credit are structured for instance, rate structure, maturity, and embedded options that expose the bank's revenue stream to changes in rates (Mwanzia, 2017). Therefore, credit portfolio refers to financial structures that consist of debt such as home and car loans. Credit can also be used interchangeably to mean loan.

Commercial banks mainly concentrate on the lending activities in their operations because a significant amount of banks revenue is made on loans through the interest income. It ends up contributing significantly to their financial performance (Bhattarai, 2015). Having a healthy loan portfolio is a vital asset for commercial banks as regards to their positive effect on their performance. However, some loans under perform as expected and ultimately result in bad

debts which affect the core earnings of the banks. The bad loans constitute a cost to the commercial banks as it relates to their effect on the asset quality and overall profitability. According to regulations governing the banking sector, banks make provisions for NPL and provide a charge for bad debts which decrease their loan portfolio and income (Pascaline Dupas, 2017).

Loan Loss Provisions (LLP) is the deduction from gross interest income derived from the income statement while loan loss reserves ratio is the annual accumulation of provisions in the statement of financial position. The quality of a credit portfolio is measured by Loan Loss Reserves ratio (LLR). Loan reserves are used to safeguard banks against adverse shocks or losses. According to Metzmakers (2005) loan loss provisions reflect managerial decisions at the specific point in time (measured annually) while loan loss reserves is the build-up of yearly net provisions over a period that reflects actual anticipated loan losses. Therefore, loan loss reserve is directly linked to a banks' quality of credit portfolio and is prone to short-term variations occurring from macroeconomic activities and the creditworthiness of individual counterparties (Metzmakers, 2005).

The Central Bank of Kenya (CBK) has grouped loans into corporate loans which are advanced to large corporate customers, Business loans advanced to small and medium enterprises and individuals and Personal loans which are granted to individuals for personal or household use. According to the credit survey done by the CBK (2018) total credit portfolio increased by 1.84% to Ksh. 2,538.68 billion in September 2018 from Ksh. 2,492.69 billion in June 2018. While the credit survey done by the CBK (2018) notes that the reduction of the Central Bank Rate (CBR) to 9% from 9.5% on July 30, 2018 was instrumental in the lowering of the interest rates in the quarter the overall effect was that it negatively affected their lending by commercial banks to SME.

1.1.3. Interest Rates Determinants and the Quality of Credit Portfolio

The relationship between lending interest rate determinants and the quality of credit portfolio has been difficult to establish. This is because change in the determinants of interest rates is largely dependent on the level of asset and liability rates. Both the assets and liability elements of a banks' balance sheet is affected by market forces in a similar fashion and therefore the net consequence on a banks' profitability can be inferred by drawing the reactions of both assets and liabilities during change in market interest rates. Banks usually are at the risk of facing insolvency because of falling asset values when bank debtors are

unable to repay their obligations due to high interest rates. Boudriga (2009) states that intrinsic risk on commercial banks' lending aims to increase returns by increasing interest rates. The Capital Asset Pricing theory looks at the aspects of systematic risk brought about by market activities that affect loan defaults risk. The theory is, therefore used in calculating the risk of the loans and a suitable interest rate to be levied to lessen the impact of default risk and increase returns (Krnck, 2011).

Studies by Din (2007) state that high levels of market interest rate improve mortgage firm's profitability. He goes on to state that the impact of interest rate spread fluctuations on banks' profitability is revealed to be asymmetric to the outcome originating from the lending rates being higher than those of deposit rates. The stochastic behaviour of market rates is claimed to be a substantial factor in the same breadth. A look at the financial books and annual reports of commercial banks in Kenya show that quality of credit portfolio is extremely affected by variables of interest rates hence necessitating a study into the problem. In the light of the above, the issue of credit portfolio quality has raised some concerns among stakeholders of commercial banks in Kenya. The research therefore seeks to investigate the influence of interest rates determinants on the quality of credit portfolio offered by commercial banks in Kenya specifically in non-performing loans (Metzemakers, 2005).

1.2. Statement of the Problem

While managing the quality of credit portfolio for commercial banks remains a challenge, the provision of loans and credit advances remains critical to the performance of banks' globally. Interest income generated on loans advanced by commercial banks impacts their financial performance and forms an important part of their asset (Bhattarai, 2015). Bad and doubtful loans accumulate debt which impacts banks adversely in their performance, operations as well as the general economy. The quality of credit portfolio influences the ability of commercial banks to lend to its customers in a sustainable manner (Jakait, 2018). Interest rates variables affect the quality of credit portfolio offered by commercial banks. If not at optimal levels, then the quality of credit portfolio is greatly affected. Statistical information from CBK annual bank supervisory report of 2015, 2014 and 2013 show that loan losses which indicate the quality of credit portfolio accounted for 1.5 % of the loan book in 2015 compared to 1.3 % in 2014 and 1.2 % in 2013 (CBK, 2015). The increase was occasioned by challenges in the operating environment and lending interest rates charged to individual clients.

A study by Onuko (2015) on the influence of credit risk management on loan portfolio found out that loan pricing has a positive result on non performing assets. Collins (2011) did an empirical study on the impact of interest rate spread on non-performing assets where he found out that Interest rate spread has an impact to non-performing assets in financial institutions because it raises the cost of loans levied to borrowers

Studies by Jakait (2018) indicate that high lending interest rates attracts risky borrowers and drives out good borrowers because risky borrowers who are eager to borrow at higher interest rates have lower repayment probability. This greatly impacts the quality of credit portfolio held by banks and therefore optimal interest rate occur beyond which additional loans are not available despite excess demand. Therefore, a regressive credit supply curve and equilibrium credit rationing exists because raising the interest rates beyond the optimal levels will lower financial institutions' profits because of the number of risky projects in their portfolio rise (Jakait, 2018).

Bhatarai (2015) did an empirical study on the determinants of lending interest rates for Nepalese banks. He determined that lending interest rates are affected by several forces that including supply of savings coming mainly from households and the cost of the savings. Thompson (2006) states that banks set their lending rate in accordance with a certain benchmark relative to the deposit rate. Lending interest rate may be measured as the cost of funding, which is a function of the aggregate liabilities and the costs of raising the different liabilities. In addition, Onyango (2017) examined the effect of credit risk management on quality of loans portfolios among the commercial banks in Kenya. These studies failed to the link between interest rate determinants and quality of credit portfolio.

While most studies conducted by past researchers focussed more on interest rates, there is a need to establish a relation on how interest rates determinants affect the quality of credit portfolio offered by commercial banks in Kenya. This study seeks to fill the research gap by analysing the influence of interest rate determinants on the quality of credit portfolio of commercial banks in Kenya.

1.3. General Objective

This study aims to investigate how interest rate determinants influence the quality of credit portfolio offered by commercial banks in Kenya.

1.4. Specific Objectives

The specific objectives of this research work are:

- a) To analyse the influence total savings, on the quality of credit portfolio offered by commercial banks in Kenya.
- b) To analyse the influence of the cost savings on the quality of credit portfolio offered by commercial banks in Kenya.
- c) To analyse the influence of capital adequacy on the quality of credit portfolio offered by commercial banks in Kenya.
- d) To analyse the influence of operational costs on the quality of credit portfolio offered by commercial banks in Kenya.

1.5. Research Questions

- a) How do the total savings influence the quality of credit portfolio offered by commercial banks in Kenya?
- b) How does cost of savings influence the quality of credit portfolio offered by commercial banks in Kenya?
- c) How does capital adequacy influence the quality of credit portfolio offered by commercial banks in Kenya?
- d) How do operational costs influence the quality of credit portfolio offered by commercial banks in Kenya?

1.6. Scope of the Study

Two broad categories determine how interest rates are set namely microeconomic factors that consist of bank-specific variables and macroeconomic variables that consist of market specific factors (Kaakunga, 2014). At micro level or the bank specific level, the variables used to determine interest rates include total savings, cost of savings, operating costs, and capital adequacy in relation to bank assets. On the other hand, at the macroeconomic level, factors like inflation, exchange rate volatility, borrowings by the public sector from commercial banks (crowding out effect) fiscal deficit, inflation and the level of economic growth have been found to be the key determinants (Bhattarai, 2015). This study tested the variables relating to bank specific factors that include total savings, cost of savings, operating costs, and capital adequacy levels.

The study covered the 40 commercial banks in Kenya that are licensed by the Central Bank of Kenya. The research evaluated the quality of credit portfolio and how interest rate affects

them. The time period of the data was from the year 2009 to 2018. Excluded from this analysis was the Islamic banks because they do not charge interest rates on their products.

1.7. Significance of the Study

This study would be instrumental in identifying and providing insights in the financial services industry as it would demonstrate how interest rates determinants affect the quality of credit portfolio that is held by the commercial banks in Kenya. Revenue for commercial banks is mainly attributed to interest income from loans. While credit portfolio growth is the main attribute of bank profitability, its quality is of a great concern. This study would provide the necessary knowledge to commercial banks, Micro Finance Institutions, SACCOs and other alternative lending channels like FinTech's on the optimal level of pricing for their loan products by avoiding the risks of overcharging loans and ensure there is efficient and sustainable business practises.

The study shall assist in providing a predictive tool to assist the implementors and policy makers in evaluating likelihood of an optimal level of lending rates while at the same time providing valuable information to investors who are interested in investing on the credit market and commercial banks especially on the critical factors that constitute their success. While Kenya has been a powerhouse for digital innovation, mobile commerce and other alternative forms of lending the findings of this study shall inform the market regulator that constitutes the Central Bank of Kenya (CBK) on the policies to be adopted by financial institutions and therefore expedite the realization of its developmental goals.

For example, the FinAccess Survey conducted by FSD Kenya (2019) indicated that the government prioritises research that is geared towards policy and intervention formulation, identifying gaps and critical factors that affect the vulnerable groups. The findings of this research shall be disseminated to the Director, Research and Policy at the KBA Centre for Research and Financial Markets Policy, which sponsors research, commentary, and dialogue regarding critical policy issues that affect financial markets here in Kenya. Kenya Bankers Association (KBA) as an umbrella body for the financial institutions that are licensed by the CBK and has a current membership of 46 financial institutions. KBA champions industry development and innovation by coordinating members and partnering with stakeholders on strategic initiatives. One aim of this research is to boost financial inclusion efforts and knowledge dissemination for the overall goal of thereby achieving the Sustainable Development Goals (SDGs). The research findings would be shared with the CBK and the

KNBS which are responsible for the production of the annual Financial Sector Report. For researchers and academicians, the outcome of the research would be very vital for reference as it would also provide an area of further study which the future researchers can base their scope of study.



CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

This chapter will delve into the literature that has been previously discussed regarding interest rates and the level of credit portfolio in Kenya. It discusses the underlying theories and gives the research gaps that exists in previous research. Literature was retrieved from a series of secondary sources that is based on interest rates in the commercial banking sector of Kenya. Focus was on the three research questions which have been elaborated in chapter one of this study. The chapter cover the role of government in the commercial bank interest regulations, effects of consumers 'attributes on interest rate movement, and how the banking policies and regulations affect the credit portfolio levels in the commercial banking sector of Kenya.

2.2. Theoretical Review of Literature

2.2.1. The Classical Theory of Interest Rates

Classical Theory also referred to as capital theory of interest, the saving-investment theory of interest or the real theory of interest because it is hinged on the variables of supply and demand forces in the economy. It was developed in 1908 by economists Ricardo, Mill, Marshall, and Pigou where they state that interest can be determined by forces of demand in the market for saving money to be invested in the capital goods and the supply of savings. Demand can be referred to as the demand of borrowing while supply can be referred to as the supply of savings. The theory states that the interest rate is the amount that is paid for saving.

The theory maintains that interest rates is determined by several factors that includes savings supply which comes mainly from households, demand for investable capital that is derived mainly from the business sector and capital adequacy that is expected to absorb economic shocks that arise during operations (Rose, 2003). Interest rates is the rate at the point of equilibrium where demand of borrowing and supply of savings intersect. Higher savings would result to an oversupply of investment leading to interest rates falling while lower savings would increase interest rates until an equilibrium is achieved (Huang, 2015). Therefore, interest rate can automatically regulate economy to equilibrium.

It was greatly criticized by Keynes (1936), who holds that interest rates is not determined by savings and investment but rather by demand for and supply for money. He goes on to state that income, and not rate of interest, is the equilibrium force between saving and investment.

Despite these criticisms, the theory has been used to support other studies by Umuro (2015) whose objective was to determine the existing relationship between interest rates and credit. The theory supports the variables of supply and demand forces in the economy and therefore it is very relevant to this study highlights the factors of total savings and cost of savings. This supports the influence total savings and cost of savings on the quality of credit portfolio offered by commercial banks in Kenya

2.2.2. Keynes Liquidity Theory

It was developed by John Maynard Keynes in 1891 and is founded on the theory of Economic Growth which states that value of money can be used for both transaction motive and as a store of wealth motive. In broad sense he states that liquidity preference is composed of transaction, precautionary and speculative motive, whereby the transaction and precautionary motive are associated to income, whereas the speculative motive, or liquidity preference is linked to interest rate.

Keynes Liquidity theory focuses on the element of market forces for demand and supply of money as the main element to determine interest rates. Cost of borrowed funds is a term that is used interchangeably to refer to interest rates. According to the theory, the market interest rate is reliant on the supply and demand of money. It can be defined as the price at which there is equilibrium to hold capital in the form of money against its supply (Appelt, 2016). Therefore, interest rate is influenced by the monetary authority where interest rate is a price that is equal to the demand for money held by the public against the monetary aggregate.

This theory was greatly criticized by Swedish economist Ohlin (1937) who holds that interest rate is impacted by factors such as the demand and supply of loanable funds where demand is the demand for investment and demand for hoarding money, while supply is planned savings, dishoarding and money held by banks (Huang, 2015).

This theory has limitations in that it does not factor in other factors such as level of income in determining the interest rates. Despite this criticisms and limitations, it has been used to support studies by Huang (2015) on the understanding of the mechanism for determining interest rates and its policy implications. This theory is relevant to this study as it highlights the influence of capital adequacy on the quality of credit portfolio offered by commercial banks in Kenya.

2.2.3. Loanable funds theory

Loanable funds theory originated from economist Knut Wicksell based in Sweden and was later developed by Ohlin (1937). It defines loanable funds as all forms of credit, bonds, and savings available in the market. Therefore, for loanable funds theory, the rate of interest is affected by the demand and supply of loanable funds.

The theory contemplates that the rate of interest is the function of four factors that include investment, savings, the supply of money and the desire to hoard it. Interest rate according to loanable funds theory is connected to the intersection between loanable funds supply and credit demand supply. It therefore concludes that there is an inverse relationship between the supply of loanable funds and the existing interest rates. Other variables like government borrowing, consumer borrowing, foreign and domestic borrowing affect loanable funds whereas supply is derived from foreign lending and domestic savings.

This theory has been criticised by Keynes (1936) who opines that it is based on an unrealistic assumption that there would be full employment. It has also been criticised that savings and income are both independent whereas savings is dependent on income. Despite these criticisms, the theory has been used to support other studies by Umuro (2015) whose objective was to measure the relationship between interest rates and credit. This theory is relevant to this study as it highlights the influence of operational costs on the quality of credit portfolio offered by commercial banks in Kenya.

2.3. Empirical Review of Extant Literature

2.3.1. Total Savings and Quality of Credit Portfolio

Savings according to Keynesian economics refers to balances left from disposable income after expenditure is incurred. The funds are placed by commercial banks clients or customers with them in the form of ordinary savings or fixed deposits. Savings are one of the main pillar of the private sector credit with its growth levels depended on economic growth, inflation, interest rate, remittance inflows and money in flow (Olokoyo, 2011). Findings by Olokoyo's (2011) indicate that liquidity ratio, deposits, and investment portfolios have significant effects on volume of lending by commercial banks.

Krnck (2011) did an empirical research on the determinants of lending rates and interest rate spread on the European country of Greece. The study utilized historical data from banks domiciled in Greece from 2001 to 2009. Panel estimation method was used for data analysis with the results from the study indicating that lending

interest rates is mostly affected by the size of the bank, share of the market and to a slighter extent by the deposit rates and NPL. While the study focused on interest spread on Greece which is a developed economy, it did not delve into how the volumes of deposits and how it affects non-performing loans.

In Barbados, Skinner (2018) researched on the determinants of non-performing loans using data from banks that are based in Barbados. The banking sector is the main form of financial intermediation and the largest conduit for domestic savings mobilisation, source of external capital for firms and the main player in the payment system in Barbados. The empirical findings of the study indicate that loan to deposit ratio is a significant determinant of non-performing loans among other factors like return on equity, return on assets, and capital adequacy ratio.

In Bangladesh, Islam (2019) examined the impact of firms-specific variables and macroeconomic factors on the deposit mobilization of private commercial banks in Bangladesh using panel data regression methodology. In this study, 14 conventional private commercial banks were observed over ten years (2007-2016) period. The results of the study provide evidence that total deposit (as measured by company size) has significant negative impact on the deposit mobilization (as measured by banks deposit growth rate) and broad money supply growth rate has substantial positive effect on the banks deposit growth rate whereas the rest of the selected variables i.e. number of banks branches, deposit interest rate, loan-to-deposit ratio, Gross Domestic Products (GDP) growth rate, inflation rate have no significant impact on the banks deposit growth rate of the private commercial banks in Bangladesh.

Locally here in Kenya, Barus (2017) did an empirical study on the effects of asset quality on the financial performance of savings and credit societies (SACCO). The research utilised an explanatory research design targeting a population of 83 registered deposit taking SACCOs in Kenya since 2011 to 2015. The research determined that asset quality influences the financial performance of SACCOs in Kenya. The limitation of the study was that it focussed on SACCOs in Kenya with most of their loan portfolio being largely secured by guarantees.

Deposits that are provided by customers or commercial banks' clients and the public is typically the cheapest source of funds that the banks have access to. In these funds, banks can enhance the rate of return by maximizing profitability particularly when there is high demand for the loans. Therefore, high deposit levels enable banks offer more loans and increase their

revenue from interest income. An efficient banking system would be of great benefit to the real economy. Provision of higher returns to depositors and reducing the cost of borrowing to potential borrowers and investors will have a positive influence in an economy.

2.3.2. Cost of Savings and Quality of Credit Portfolio

Cost of savings constitutes the interest expense that is paid to a depositor (Pascaline Dupas, 2017). Cost of savings can also be referred to as interest expense on borrowings. Most financial institutions borrow money at cost to on lend to their customers thereby incurring expenses for such amounts of money.

Schnitzel (1986) studied the causality effect existing between deposit rates and the rate of mortgage loan using empirical assessments. The research findings from the study indicates that interest rates for loans are influenced by deposit rates levels in force during the regulated period under the deposit interest rate rule.

In Germany, Mushtaq (2016) did an empirical research on the effect of interest rates on commercial banks deposits using data from both Islamic and non-Islamic nations. The key purpose of the study was to establish if religious considerations has any impact on Muslim choice when saving in commercial banks. The study adopted the panel least square method with a fixed effect model by utilizing 55 non-Islamic and 15 Islamic countries data ranging from the year 2005 to 2013. The findings indicated that in Islamic countries, the level of interest rates does not have any bearing on commercial bank deposits however, money supply and inflation do have positive substantial impact. In the case of non-Islamic countries, both the rate of interest and money supply have a positive substantial effect on a bank deposit however, inflation seems to be insignificant.

In Namibia, Sheefeni (2016) examined the impact of interest rate spread on the non-performing loans. The research utilized the unit root technique, cointegration technique and error correction model technique with evidence from the quarterly figures for the period ranging from 2001 to 2014. The research findings indicated that interest rate spread had a positive and statistical substantial impact on non-performing loans in Namibia. The findings therefore suggest that there is a positive effect of interest rate spread in that a rise in interest rate margins has the potential of increasing the likelihood of defaulting on loans by clients.

Locally here in Kenya, Ng'etich (2011) did an empirical study on the effect of the interest rate spread on the degree of non-performing assets on commercial banks licensed to operate

in Kenya. The research utilized a descriptive design by using questionnaires to gather data from primary sources and secondary data gathered from the annual Bank Supervision Report published by the CBK to augment the primary data discoveries. The findings of the research conclude that the interest rate spread influences non-performing assets in commercial banks because it raises the cost of loans levied to borrowers. Interest rates regulations have a significant effects on non-performing assets in that it determines the spread in banks and helps to lessen the moral hazards that are incidental to non-performing assets. The technique for credit risk management remotely influences the value of a commercial bank's interest rate spread because interest rate is benchmarked against the related non-performing assets and therefore non-performing assets are attributed to high interest rate of loans.

2.3.3. Capital Adequacy and Quality of Credit Portfolio

Capital adequacy is the statutory minimum reserves that financial institutions hold to meet the immediate debts and absorbs shocks in the business operations (Sentero, 2012). It is used as a reserve of contingent funds which can provision for bad and doubtful debts. Capital adequacy requirements determine the level of capital that a bank can deploy to vehicles that will generate income to an organisation. They have an overall impact on the subsequent interest rates that financial institutions charge.

In Croatia, Cihak (2004) did a research on the determinants of interest rates and interest rate spreads from the period between 1999 to 2003. He based the results on panel estimation where he states that there is an inverse relationship between lending rates and interest rate spreads on one hand, size of the bank including its entire asset base, level of liquidity, and foreign ownership. Capital adequacy ultimately impacts lending interest rates differently from interest spreads. Cihak (2004) goes on to state that banks that have a higher level of capital adequacy rate usually have lower rates of lending and even lower rate of deposit and therefore their spreads are even higher than in commercial banks that have lower capital adequacy.

In Tanzania, Lotto (2018) did a study that examined the effect of capital requirements regulation on the operating efficiency of commercial banks in Tanzania. The research employed bank level data starting from 2009 to 2015. The research findings showed a positive and substantial relationship between the ratio of capital levels and the bank operating efficiency. The author concluded that commercial banks that have strict capital regulations are usually more operationally efficient. This connection proposed that capital adequacy

levels not only fortifies financial stability through provision of a greater capital buffer, but it also improves the banks' operating efficiency by averting a moral hazard problem between shareholders and debtholders.

In the Philippines, Rivera (2017) studied the credit risk and capital adequacy for 567 countryside banks that are based in the Philippines and how both variables influence the banks' profitability. The study utilized the Arellano-Bond estimator, with the findings indicating that credit risk has an adverse and statistically substantial relationship with profitability. Nevertheless, the findings from the empirical analysis indicate that capital levels have no substantial impact on the profitability of the rural banks that are based in the Philippines. Consequently, it is essential for the banks to scrutinize extensively if capital infusion would result to high profitability levels than increasing debts.

Locally in Kenya, Nzioki (2011) analysed the effect of capital adequacy on the performance of commercial banks listed at the NSE. Capital adequacy provides buffer against the losses incurred and therefore it guarantees safety and soundness of financial institutions. It is therefore essential to guarantee that the banks have enough capital. The findings indicate that adequacy of capital and the percentage of borrowings when compared to the ratio of deposits to credit signify the soundness and stability of a bank. He goes on to state that, the capital base of a financial institution enables depositors in establishing their risk perception about the bank.

2.3.4. Operational Costs and Quality of Credit Portfolio

Operational costs relate to the expenses that are associated with the functioning of a business. They are associated with maintenance and administration of a business on a day to day basis. Al-Haschimi (2007) examined the factors contributing to banks net interest rate margins for ten Sub-Saharan Africa (SSA) nations using accounting breakdowns and panel regression analysis. The findings of the study were that credit risk and the operating inefficiencies both of which signify market power describe most of the disparity in net interest margins throughout the region and therefore an overall effect in the non-performing loans. Macroeconomic risk generally has partial impact on net interest margins according to the study.

Simpasa (2014) did a study on the factors of bank lending rates in Zambia. The author utilized panel data regression technique by using detailed bank-specific information reflecting a wide variety of income and cost variables for commercial

banks. The findings of the research show that lending rates are to a substantial degree affected by factors relating to banks' costs. The author goes on to state that inflation has substantial effect on the nominal interest rates on an almost one-to-one basis. Besides inflation levels, components of a financial institution's balance sheet show that lending rates are to a substantial effect also positively affected by factors related to higher cost structures or lower income.

According to the efficiency market hypothesis (EMH), attaining lower cost of production enables banks to deliver loans or credits at a fair and reasonable costs. This will result in the expansion of market share because the bank develops competitive advantages as compared to other banks. Privatization in the banking sector raises competition which reduces the operating costs (Muliro, 2014). This is because share of market drops with the increase in competition within the sector.

2.3.5. Credit Portfolio

Credit portfolio refers to an assortment of credit exposures formed as part of financial intermediation actions like the regular lending process, contracts relating to derivatives or as an investment in credit risk sensitive securities including corporate bonds. Credit portfolio of a bank is the main asset in a commercial bank's balance sheet and the most predominant source of revenue for them. It is also one of the highest causes of risk to a bank's safety and soundness. The degree of interest rate risk accredited to the bank's lending operations is dependent on the structure of its loan portfolio and the degree to which the terms of its loans such as maturity term, interest rate structure, and embedded options expose the revenue stream of the bank to variations in the interest rates (Simpasa, 2014).

The Central bank base lending rate can be defined as the interest rate that a nation's central bank will charge to commercial banks for loans (Kenton, 2017). The base lending rate can also be referred to as the base interest rate or the bank rate. Whereas commercial banks can set their own borrowing interest rates, the rates that they levy on loans and provide on deposits or savings are derived from the base lending rate. In Kenya, the base lending rate is set by the Central Bank of Kenya (CBK) as it responsible for maintaining a stable monetary policy environment. If the CBK lowers the base rate, banks would also probably reduce their lending rates translating to an affordable loan rates for borrowers. Having affordable lending rates will have an impact on the level of non-performing loans in the books of commercial banks (Kenton, 2017).

2.3.5.1. Quality of Credit Portfolio

In Kenya, Onuko (2015) studied the impact of credit risk management on the loan portfolio for tier one commercial banks licensed Kenya. The empirical research analysed quality of loan portfolio which was the dependent variable and loan pricing which was the independent variable. A descriptive research design was applied on tier one commercial banks' financial statements for the years 2009 to 2013. The analysis for the data was done using a regression model with the findings indicating that loan pricing has a positive effect on non performing assets.

In Germany, Bredl (2018) investigated the relationship existing between non performing loans and interest rates in the eurozone. The findings of the study specify that there is a positive causal relationship between net non performing loans and lending interest rates. The findings however did not establish whether a relationship existed between gross non performing loans and the lending interest rates in the eurozone.

In Namibia, Sheefeni (2016) studied the impact of interest rates spread on non performing assets in the country. The study used various research techniques of cointegration, unit root technique and error correction model technique on the quarterly data gathered from the period of 2001 to 2014. The findings indicate that interest rate spread show positive and statistically substantial impact on non-performing loans in the country. These findings advocate that an increase in interest rate margins has the potential of increasing the likelihood of defaulting on loans by borrowers. This study was very critical of the Namibian country because of the vastly concentrated assets on mortgage loans which is where they derive most of their profits. The main risk in this scenario is that any act of manipulating profit margins raises the likelihood of defaulting on loans by borrowers.

In Kenya, Collins (2011) did an empirical study on the impact of interest rate spread on the level of non-performing assets. The research utilized a descriptive research design using evidence from all commercial banks licensed to operate in Kenya. The main objective of the research was to determine if there is a relationship between interest rates spreads and non-performing assets in Kenya. The key finding of the research was that interest rate spreads affect the non-performing assets in commercial banks because it raises the cost of loans charged to the clients. The main limitation of this study was that the assets analysed had security/collateral value that was adequate to cover the loan.

In Kenya, Ngugi (2001) did an empirical research on the interest spread in Kenya. The key aim of the research was to explain the factors that determine interest rate spread for Kenya's financial industry. One of the key findings was that credit risk played an important role in determining the level of interest rates with banks that faced high credit risk as non-performing loans increased responded by charging a high-risk premium on the lending rate. Ngugi (2001) went ahead to conclude that high non-performing loans is as a result of poor business environment and distress borrowing, which is accredited to the absence of alternative sources of credit when banks increase their lending rate. While the study attributed the change in interest rates inflationary pressures with the banks looking to maintain healthy profit margins, it did not investigate the overall effect the change in interest rate would have to the overall portfolio of the banks.

2.4. Research Gap

Past research especially from Skinner (2018), assesses variables related to determining factors of non-performing loans. There are studies testing the variables that affect the quality of portfolio held by commercial banks in Kenya relate to interest spread and non-performing loans. While the previous researchers like Sheefeni (2016) focussed interest rates and its expected impact on bank loans in general, most of it did not address the causal relationship that exist between interest rates determinants and the quality of credit portfolio by commercial banks. This will measure the relationship between interest rates determinants and the quality of credit portfolio of commercial banks. This study aims to fill the research gap by analysing how interest rates determinants affect quality of credit portfolio of commercial banks in Kenya. Gaps are illustrated in Table 2.1.

Table 2. 1: Research Gaps

Author	Title	Gaps	Focus of the Current study
Krnck (2011)	An empirical research on the determinants of lending rates and interest rate spread on the European country of Greece	The study focused on Europe and Greece and not so much in the local setting of Kenya	The study would be localised to lending rates affecting commercial banks in Kenya
Barus (2017)	An empirical study on the effects of asset quality on the financial performance of savings and credit societies	The study focused on SACCOs and not Commercial banks	While SACCOs play a huge role in the credit market, commercial banks have more market share and therefore

	(SACCO).		focus would be on the quality of credit portfolio offered by commercial banks in Kenya
Mushtaq (2016)	An empirical research on the effect of interest rates on commercial banks deposits using data from both Islamic and non-Islamic nations	The study did not link interest rate determinants and quality of credit portfolio	This study will link interest rate determinants and how they influence the quality of credit portfolio offered by commercial banks in Kenya
Sheefeni (2016)	Impact of interest rate spread on the non-performing loans.	The study did not link interest rate determinants and quality of credit portfolio	The study will establish a link of how interest rate factors influence the quality of credit portfolio offered by commercial banks in Kenya
Lotto (2018)	Effect of capital requirements regulation on the operating efficiency of commercial banks in Tanzania	The study did not link interest rate determinants and quality of credit portfolio	The study will investigate how capital adequacy as a factor of interest rate determinant influences the quality of credit portfolio offered by commercial banks in Kenya
Nzioki (2011)	Effect of capital adequacy on the performance of commercial banks listed at the NSE	The study did not link interest rate determinants and quality of credit portfolio	The study will investigate how capital adequacy as a factor of interest rate determinant influences the quality of credit portfolio offered by commercial banks in Kenya
Sheefeni (2016)	Interest rates and its expected impact on bank loans	The study did not link interest rate determinants and quality of credit portfolio	The study will investigate the main impact of interest rate determinants on the quality of credit portfolio offered by commercial banks in Kenya

2.5. Conceptual Framework

The conceptual framework is used to define the nature of research variables that would be studied and how they would be measured. A conceptual framework reflects the theoretical and conceptual variables surrounding research interest and forms a comprehensible and consistent foundation that underpins the development and identification of existing variables. The independent variables of the study are summarized into Total Savings, Cost of Savings, Capital Adequacy, Operational Costs while the dependent variable is the Quality of Credit Portfolio. The control variables for the study are bank size, profitability, Market Share, Real GDP growth and inflation rate which are also factors that can affect the quality of credit portfolio for commercial banks. This study will focus on total savings, cost savings, capital adequacy and operational costs as independent variables since they are the main determinants of interest rates in Kenya.

Figure 2.1 illustrates the conceptual framework.

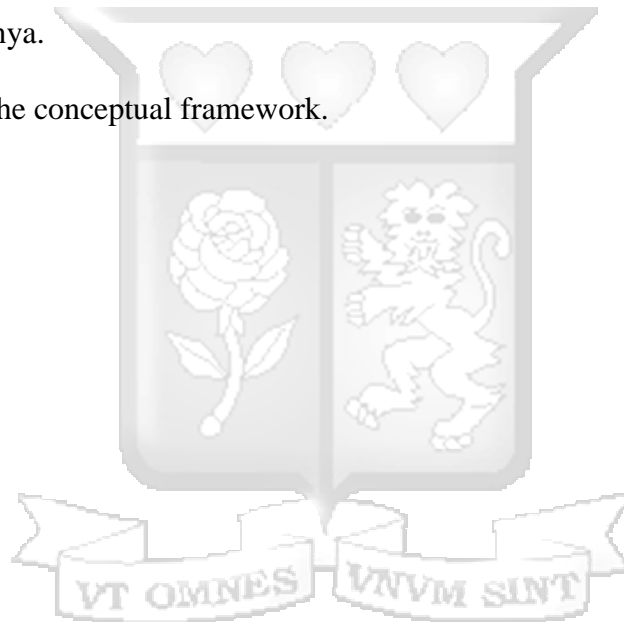
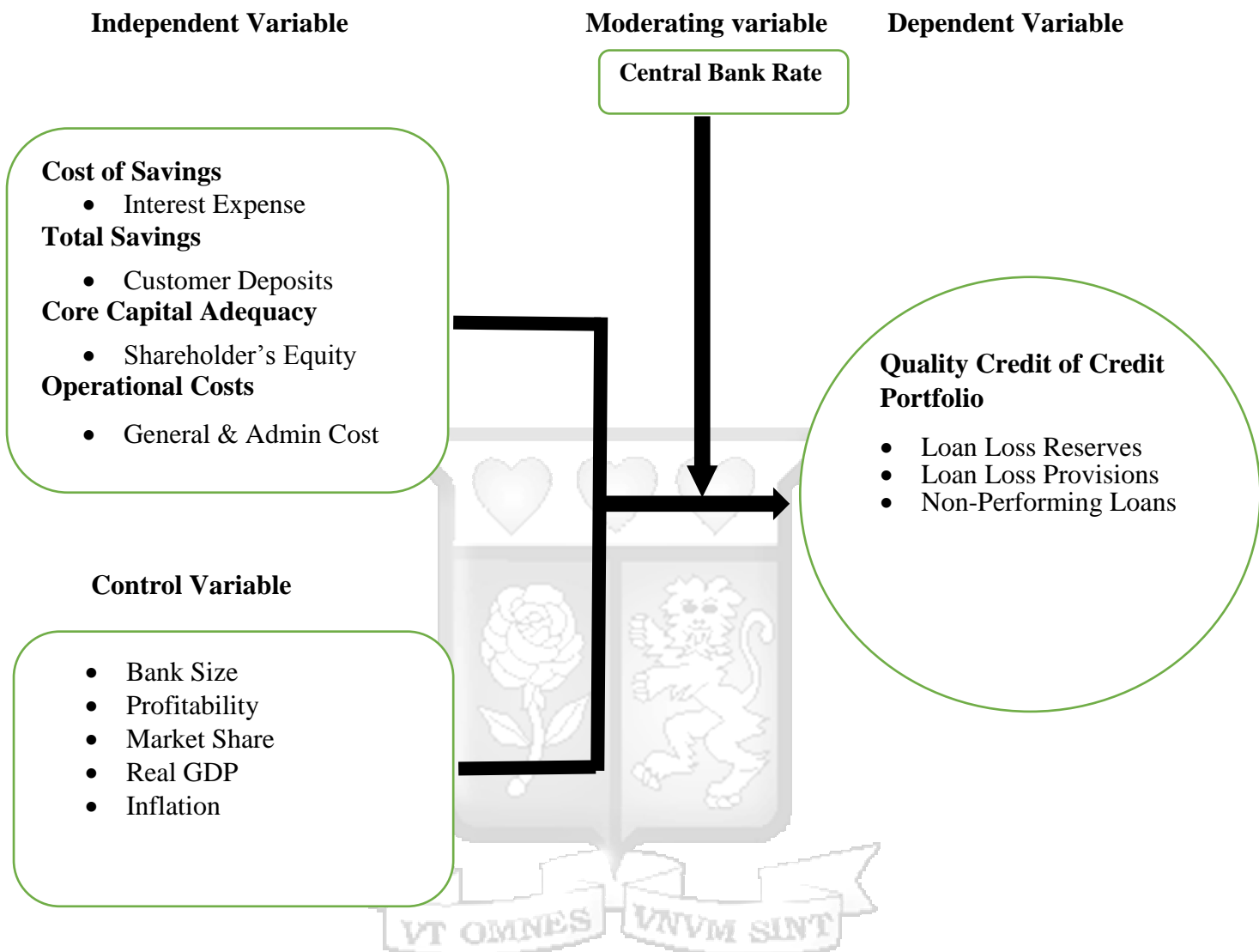


Figure 2. 1: Conceptual Framework



2.6. Operationalization of the Variables

Operational variables or operationalizing definitions denotes how you will define and measure specific variables to be used in the study. Operational meaning of a variable is the statement of the exact dimensions and elements through which a concept will be made measurable (Hussain, 2013).The independent variables of the study are summarized into Total Savings, Cost of Savings, Capital Adequacy, Operational Costs and Quality of Credit Portfolio. Level of Credit portfolio will be the dependent variable in the study. According to Balás (2009), the most common indicator used to Quality of Credit Portfolio is the ratio of non-performing loans (NPL) to total outstanding loans. This study will adopt the same approach in line with the guidelines given by the CBK.

Empirical evidence by Abdul (2018) shows the variables of cost of savings as measured with interest rates, total savings as measured with customer deposits, capital adequacy as measured with shareholders equity and operational costs as used in different contexts have outcomes that are positive.

The CBK, like most other monetary authorities, is assigned with the duty of formulating and implementing monetary policies aimed at attaining and sustaining low levels of inflation as one of its two principal objectives while the other is to sustain a sound market-based financial system. Use of Central Bank Base Lending Rates is the tool used for monetary policy strategy with the major bearing on the overall affordability of credit to consumers. An econometric study done by Mwiroti (2012) to examine the impact of lending rate policies on loan portfolio of commercial banks in Kenya established a strong link of the base lending rates by the CBK as being a moderating variable.

The table below shows the operational variables to be used in the study.

Table 2. 2: Operationalization Variables.

Variable	Measure	Scale	Calculation	Supporting Literature	Supporting Theories
Cost of Savings	Interest Expense	Ratio	$(\text{Total Payoff} - \text{Principal borrowed}) * 100 / \text{Principal}$	Schnitzel (1986) Mushtaq (2016) Sheefeni (2016) Ng'etich (2011)	The Classical Theory of Interest Rates
	Interest Rebates				
Total Savings	Customer Deposits	Ratio	Total Bank Deposits / Total Liabilities	Krnck (2011) Skinner (2018) Nahidul Islam (2019) Barus (2017)	The Classical Theory of Interest Rates
	Deposits by local banks				
	Deposits by Foreign banks				
Core Capital Adequacy	Shareholders' Equity	Ratio	Total Bank Capital / Total Assets	Cihak (2004) Lotto (2018) Rivera (2017) Nzioki (2011)	Keynes Liquidity Theory
	Retained Earnings				
	Revaluation/ Other Reserves				
Operational Costs	Employee Salary & Benefits	Ratio	$(\text{Total Operating Expenses} -$	Al-Haschimi (2007)	Loanable funds theory

	General & Admin Expenses		Depreciation)/Gross Revenue	Simpasa (2014) Muliro (2014)	
Quality of Credit Portfolio	Allowance for Loan Loss Ratio	Ratio	Allowance for Loan Loss/Total Loans	Onuko (2015) Bredl (2018)	Loanable funds theory
	Provision for Loan Loss Ratio	Ratio	Provision for Loan Loss/Total Loans	Sheefeni (2016) Collins (2011)	
	NPLs to Total Loans	Ratio	NPLs/Total Loans		
	NPLs to Total Equity	Ratio	NPLs/Total Equity		



CHAPTER THREE: RESEARCH METHODOLOGY

3.1. Introduction

The chapter examines how the study was conducted to achieve the research objectives. This chapter describes the design of the research and the methodology that was adopted to carry out the study. The section additionally examined the study population, data collection methods and data analysis techniques.

3.2. Research Philosophy

Research philosophy explains the way evidence about a phenomenon should be gathered, analysed, and ultimately used (Saunders, 2016). The philosophical method is based on one's ability to make sound and reasoned arguments. Ancient philosophers established two main types of reasoning to test the validity of their observations and to construct rational arguments, that is phenomenological philosophy or constructivism and positivism philosophy (Cooper & Schindler, 2008). This type of reasoning provides framework for the kind of logical analysis that drives scientific research and discovery (Hoagwood, 2015). There are three broad research philosophies that include pragmatism, positivism, realism and interpretivism. This study adopted Interpretivist approach that supports exploration secondary data.

3.3. Research Design

The research adopted an explanatory research design which is a form of non-experimental study that measures two variables and assesses whether there is a statistical relationship or a correlation amongst them with little or no exertion to control extraneous variables (Mugenda 2013). This study tested the different variables especially whether quality credit portfolio is affected by interest rates determinants. This is to establish the causal relationship existing between interest rates determinants and the quality of credit portfolio offered by commercial banks.

3.4. Population and Sampling

The population target refers to the number of elements to which the investigator wants to simplify the results of the study (Mugenda, 2003). Population of interest for the research covered all the 40 commercial banks (Source: CBK (2018)) in Kenya currently licensed by the CBK excluding the Islamic banks that do not charge interest rates. The commercial banks licensed to operate in Kenya are categorized into three tier levels using a weighted composite

index that consists of the capital and reserves, total net assets, total customer deposits, total sum of deposit accounts and customer loan accounts. A commercial bank with a weighted composite index equal to 5 percent or greater is categorized as a big bank. Medium sized banks have a weighted composite index ranging from 5 percent to 1 percent whereas small banks have a weighted composite index of less than 1 percent (Central Bank of Kenya, 2018). During the financial year that ended on 31st December 2018, there were a sum total of 9 big banks with a collective market share of 70.28%, 10 medium banks with a combined market share of 21.22 percent and a sum total of 21 small banks with a collective market share of 8.50%. This study used all commercial banks that are licensed and regulated by the CBK excluding Charterhouse Bank Limited, which is under statutory management, Imperial Bank and Chase Bank which were in insolvent.

3.5. Data Collection Methods

Data collection process involves the systematic way of gathering and measuring information from a wide variety of sources (Hoagwood, 2015). It can be distinguished into two broad categories that include quantitative and qualitative approaches. Quantitative approaches use numbers and numerical information whilst qualitative data lends itself to description and words. This study used data extracted from the annual banking supervision report that is published annually by the CBK, and the individual banks website and disclosures. Datasets from the variables of study, the data was obtained from various sources mostly including the commercial banks financial statements and the Central Bank of Kenya. Total savings, Capital Adequacy and the Quality of Credit Portfolio was extracted from the commercial banks' balance sheet or Statement of Financial Position while the Operating Costs was derived from the Income Statements of the bank. The Cost of Savings for all the commercial banks was derived from CBK data sets on the interest charged. The secondary data was collected by viewing and exploring the commercial banks financial statements and financial reports in CBK between April to May 2020.

3.6. Data Analysis

Data analysis is a method of scientifically employing statistical or logical procedures to define, explain, evaluate, condense, recap, and illustrate data. It involves cleaning, transforming, and modelling data figures into valuable information which can be summarized used to comprehend relationship that exists between variables (Grant, 2020). The analysis

used for this study included descriptive and inferential statistical procedures, which included mean, standard deviation, and regression analysis.

Descriptive statistics was adopted to describe and illustrate the research variables for interest rates determinants (total of savings, cost of savings, capital adequacy and operational costs) and the quality of credit portfolio offered by commercial banks in Kenya. It was cascaded down to measures of central tendency and measures of variability (spread). Measures of central tendency constitutes the mean, median, and mode whereas measures of variability constitutes standard deviation, variance, minimum and maximum variables, and lastly the kurtosis and skewness. For testing random and fixed effects, the study employed the panel data regression models using the Hausmann Test.

Correlation analysis was utilized in the study to evaluate the strength of relationship that exists between two quantitative variables (Iuliano, 2019). It is the method of evaluating the existing strength of a relationship with the existing statistical data. When there is a high correlation, it shows that either two or more variables are strongly relationship to each other, whereas a weaker correlation shows that the variables are barely related. When looking at the power of the relationship, the range of the correlation coefficient fluctuates between +1 and -1. A value of ± 1 shows a perfect degree of association between two variables. The Pearson correlation coefficient was utilized in this research to evaluate the power and the direction of the existing relationship between the dependent and independent variables.

OLS model is better tool for analysing panel data than panel data regression model since it is better in predicting the influence of interest rates determinants on the quality of credit portfolio in a given period of time. Pooled OLS regression analysis is recommended to use in the research because it can forecast the value of the variables based on the value of two or more other variables. This analysis evaluates the existing relationship between the multiple independent/predictor variables and one dependent/criterion variable. For this research, multiple regression analysis was performed to establish the relationship between interest rates determinants and the quality of credit portfolio offered by commercial banks in Kenya.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \varepsilon$$

Where: -

Y= Quality of Credit Portfolio

β_0 =constant

$\beta_1, \beta_2, \beta_3, \beta_4$ = regression coefficients

X_1 = Total of Savings

X_2 = Cost of Savings

X_3 = Capital Adequacy

X_4 = Operational Costs

X_5 = Bank Size

X_6 = Profitability

X_7 = Market Share

X_8 = Real GDP

X_9 = Central Bank Rate

X_{10} = Inflation Rate

The implication of the individual regression co-efficient was tested at 95% confidence level to determine the variable that has the highest effect on the dependent variable. The study used an analysis of variance (ANOVA) to examine the influence of interest determinants on the quality of credit portfolio offered by commercial banks in Kenya.

3.7. Diagnostic Tests

A diagnostic test comprising of the test for normality, multicollinearity, autocorrelation, and heteroscedasticity was done. Normality test was done to evaluate if the data set is well-modelled through a normal distribution. To test for normality, the research used Kolmogorov-Smirnova K-S and Shapiro-Wilk S-W tests and QQ plots. The K-S test involves an empirical distribution function (EDF) where the theoretical cumulative distribution function of the test distribution is compared with the EDF of the data. The Shapiro-Wilk test is founded on the existing correlation between the data and the equivalent normal scores thereby providing better power than the K-S test even after the Lilliefors correction (Zahediasl, 2012).

For multicollinearity, the study utilized collinearity statistics for High Variance Inflation Factor (VIF) and Low Tolerance to test if the independent variables are effectively correlated to indicate a significant causal correlation. These two statistical tools are ideal because they are reciprocals of each other to mean that either a higher VIF or a lower tolerance is suggestive of multicollinearity (Frost, 2018).

Autocorrelation test was done using the Durbin-Watson (DW) test. The DW tests produces a statistical test that varies from 0 to 4. Values that are closer to 2 which is the middle of the range is indicative of a less autocorrelation, whereas values close to 0 or 4 suggest a higher positive or negative autocorrelation, respectively (Smith, 2020).

Heteroscedasticity test was done to check whether the variance of the dependent variable fluctuates across the statistical data (it tests for the assumption of equal variance). The Levene's test was adopted in the study to evaluate if the samples have equal variances. When there are equal variances across the samples, then it is referred to as homogeneity of variance. To test for heteroscedasticity, the Levene's test was adopted where if the P-value is < 0.05 it is indicative of the presence of a non-uniform variance.

3.8. Research Quality

Research Quality is the scientific process that includes all facets of the study design, methods, the selection of subjects, measurements of outcomes and protection against bias (Ashby, 2003). The research quality can be broadly discussed in two broad themes: Research Reliability and Research Validity

3.8.1. Research Reliability

Research reliability is the level at which the results are consistent and reliable over a period. A more accurate illustration of the total population of the research is usually denoted to as reliability and therefore if the results of the research can be replicated under a methodology that is similar, then the research instrument is deemed to be reliable (Golafshani, 2003). The research used the operating banks regulated by the CBK. The data is reliable as most of it was mined from the industry regulator.

3.8.2. Data Validity

Data validity examines whether the research really measures what it was proposed to measure and how genuine the results of the research are (Golafshani, 2003). The study determined

validity by establishing the ratios and confirming them with the disclosures as reported by the commercial bank. The validity check was done sample check with the bank reported results.

3.9. Ethical Issues in Research

This study followed ethical procedures by ensuring that that the rights of the respondent are observed. In conducting research, there are ethical principles that should be adhered to protect respondents and improve the quality of a study. This study used quantitative data and there are no foreseeable risks to anyone during the study. The study uses data from the CBK, which is publicly available. Institutional Ethical approval was sought from Strathmore University and a research permit was obtained from NACOSTI.



CHAPTER FOUR: PRESENTATIONS OF RESEARCH FINDINGS

4.1 Introduction

This chapter represents the analysis, findings, and interpretations of the research on the influence of interest rates determinants on the quality of credit portfolio offered by commercial banks in Kenya. The research analysis is based on the annual data from the 40 commercial banks for ten-year period from 2009 to 2018. Whereas descriptive and inferential statistics were utilized to interpret the results of the study, tables and graphs were used for presentation of the findings.

4.2 Sample Representation

Sample representation refers to how various targeted items in a study are represented in data analysis. The study targeted all commercial banks in Kenya which were 40. Hence the study adopted a census sampling method. The study sample was 40 commercial banks and it collected data from all the commercial banks. This gave a 100% sample representation.

4.3 Descriptive Statistics

Descriptive statistics is a summary of the data set, which can be either be an illustration of the entire population or a sample (Kentyon, 2019). Descriptive statistics aids to define and comprehend the characteristics of a specific data set by breaking it down to short summaries about the sample and measures of the data. It can be summarized into the measures of central tendency and the measures of variability (spread). Measures of central tendency includes median, mean, and mode, whereas measures of variability comprises of the variance, standard deviation, the minimum and maximum variables, kurtosis, and skewness.

This section sought to describe the research variables and to establish descriptive Statistics for interest rates determinants (total of savings, cost of savings, capital adequacy and operational costs) and the quality of credit portfolio offered by commercial banks in Kenya. The research findings are as illustrated in Table 4.1.

Table 4. 1: Descriptive Statistics

Variable	Obs	Mean	Median	Std. Dev.	Min	Max	Skewness	Kurtosis
Total of savings	40	0.9063	0.9198	0.1207	0.5703	1.2152	-0.539	1.659
Cost of savings	40	0.4870	0.4937	0.1664	0.1468	0.8321	-0.100	-0.381
Capital adequacy	40	0.2312	0.1834	0.1309	0.0785	0.7063	1.752	3.636
Operational costs	40	0.6013	0.5658	0.3021	0.0000	1.3745	0.630	0.745
Quality of credit portfolio	40	0.1077	0.0749	0.0724	0.0002	0.2541	0.494	-1.135
Bank Size	40	13.3587	13.3226	0.7931	12.2500	14.6800	0.171	-1.498
Profitability	40	9.5982	9.7389	1.1157	6.8300	11.3000	-0.466	-0.348
Market Share	40	3.7309	3.7176	0.2670	3.2100	4.3600	0.145	-0.605
Real GDP	40	4.2726	4.2787	0.0561	4.1400	4.4000	-0.252	-0.163
Central Bank Rate	40	2.2406	2.2243	0.1294	1.9500	2.4400	-0.303	0.065
Inflation Rate	40	1.7363	1.6733	0.1983	1.5100	2.1300	0.983	-0.346

4.3.1. Total Savings

The descriptive analysis for total savings of commercial banks in Kenya for the period of the study shows that the mean for ratio of total savings was 0.9063 while its standard deviation was 0.1207. In addition, the maximum ratio for total of savings was 1.2152 and the minimum ratio for total of savings was 0.5703. The median was 0.9198. The mean was skewed to the left as skewness statistic was -0.539 and exhibited positive kurtosis as shown by 1.659. These findings are in concurrence with Krnck (2011) who examined determinants of lending rates and interest rate spread in the European country of Greece using panel estimation methods which indicated that lending rates are typically affected by the size of the bank, market share and to a smaller extent by the deposit rates and non-performing loans.

4.3.2. Cost of Savings

The descriptive analysis for cost of savings of commercial banks in Kenya for the period of the research shows that the mean for ratio of cost of savings was 0.4870 while its standard deviation was 0.1664. In addition, the maximum ratio for total of savings was 0.8321 and the minimum ratio for total of savings was 0.1468. The median was 0.4937. The mean was skewed to the left as skewness statistic was -0.100 and exhibited negative kurtosis as shown

by -0.381. These findings correlate with Schnitzel (1986) who studied the causality effect between deposit rates and mortgage loan rates using empirical tests whereby he argued that loan interest rates have been impacted by deposit interest rates for the time under the regulated deposit interest rate regime.

4.3.3. Capital Adequacy

From the findings, the descriptive analysis for capital adequacy of commercial banks for the period of the study shows that the mean for ration is 0.2312 while its standard deviation is 0.1309. In addition, the maximum ration for capital adequacy was 0.7063 and the minimum ration for total of savings was 0.0765. The median was 0.1834. The mean was skewed to the right as skewness statistic was 1.752 and exhibited positive kurtosis as shown by 3.636. This concurs with Nzioki (2011) who did an analysis of the effect of capital adequacy on the financial performance of commercial banks quoted at the NSE. The author goes on to indicate that that capital adequacy, portion of borrowings when compared to the level of deposits and the ratio of credit to deposit rates signify the soundness of a bank. He goes on to state that, capital base of financial institutions enables depositors and investors to form their risk perception about the organization.

4.3.4. Operational Costs

The findings indicate that the descriptive analysis for mean of ratios for operational costs of commercial banks for the period of the study was 0.6013 and its standard deviation was 0.3021. The minimum ration for operational costs was 0.0000 and its maximum was 1.3745. The median was 0.5658. The mean was skewed to the right as skewness statistic was 0.630 and exhibited positive kurtosis as shown by 0.745. This conforms to Simpasa (2014) who studied the determinants of bank lending rates in Zambia using panel regression techniques and established that lending rates are to a substantial extent affected by variables involving to the cost of running the banks. The author goes on to state that inflation has a substantial effect on the nominal interest rates on an almost one-to-one basis.

4.3.5. Quality of Credit Portfolio

From the findings of the study, the descriptive analysis for mean of ratios for quality of credit portfolio of commercial banks for the period of the study was 0.1077 and its standard deviation was 0.0724. Additionally, the minimum ration for quality of credit portfolio was 0.0002 and the maximum ratio was 0.2541. The median was 0.0749. The mean was skewed to the right as skewness statistic was 0.494 and exhibited negative kurtosis as shown by -

1.135. This concurs with Ngugi (2001) who did an empirical analysis of interest spread in Kenya thereby stating that high non-performing loans is caused by poor business environment and distressed borrowing, which is credited to minimal alternative sources for credit when banks increase their lending rate. While the study attributed the change in interest rates inflationary pressures with the banks looking to maintain healthy profit margins, it did not investigate the overall effect the change in interest rate would have to the overall portfolio of the banks.

4.3.6. Bank Size

From the findings of the study, the descriptive analysis for mean of natural logarithm for total assets that measures bank size of commercial banks for the period of the study was 13.3587 and its standard deviation was 0.7931. Additionally, the minimum value for natural logarithm of total assets that measures bank size was 12.25 and the maximum value was 14.68. The median was 13.3226. The mean was skewed to the right as skewness statistic was 0.171 and exhibited negative kurtosis as shown by -1.498.

4.3.7. Profitability

From the findings of the study, the descriptive analysis for mean of natural logarithm for total profits that measures profitability of commercial banks for the period of the study was 9.5982 and its standard deviation was 1.1157. Additionally, the minimum value for natural logarithm for total profits that measures profitability was 6.830 and the maximum value was 11.30. The median was 9.7389. The mean was skewed to the left as skewness statistic was -0.466 and exhibited negative kurtosis as shown by -0.348.

4.3.8. Market Share

From the findings of the study, the descriptive analysis for mean of market share for the period of the study was 3.7309 and its standard deviation was 0.267. Additionally, the minimum value for market share was 3.21 and the maximum value was 4.36. The median was 3.7176. The mean was skewed to the left as skewness statistic was 0.145 and exhibited negative kurtosis as shown by -0.605.

4.3.9. Real GDP

From the findings of the study, the descriptive analysis for mean of real GDP for the period of the study was 4.2726 and its standard deviation was 0.0561. Additionally, the minimum value for real GDP was 4.14 and the maximum value was 4.40. The median was 4.2787. The

mean was skewed to the left as skewness statistic was -0.252 and exhibited negative kurtosis as shown by -0.163.

4.3.10. Central Bank Rate

From the findings of the study, the descriptive analysis for mean of central bank rate for the period of the study was 2.2406 and its standard deviation was 0.1294. Additionally, the minimum value for central bank rate was 1.95 and the maximum value was 2.44. The median was 2.2243. The mean was skewed to the left as skewness statistic was -0.303 and exhibited positive kurtosis as shown by 0.065.

4.3.11. Inflation Rate

From the findings of the study, the descriptive analysis for mean of central bank rate for the period of the study was 1.7363 and its standard deviation was 0.1983. Additionally, the minimum value for central bank rate was 1.51 and the maximum value was 2.13. The median was 1.6733. The mean was skewed to the right as skewness statistic was 0.983 and exhibited negative kurtosis as shown by -0.346.

4.4 Diagnostic Tests

The study conducted a diagnostic test comprising of the test for normality, multicollinearity, autocorrelation, and heteroscedasticity.

4.4.1. Normality test for the Dependent Variable

A test for normality is used to examine if the data set is well-modelled using a normal distribution and to determine the probability that a variable that is random underlying the data established to be normally dispersed. Normality tests measures a goodness of fit for a normal model in relation to the data and therefore when there is a poor fit, then the data is not well modelled, without making a finding on any underlying variable (Zahediasl, 2012).

This study used Kolmogorov-Smirnova (K-S), Shapiro-Wilk (S-W) statistical tests and QQ plots to determine the normality of the data. The K-S test is an empirical distribution function (EDF) where the theoretical cumulative distribution function of the test distribution is compared with the EDF of the statistical data. The S-W test is based on the existing correlation between the statistical data and the equivalent normal scores and it offers a better power than the K-S test even after the Lilliefors correction. Power is the most common measure for normality test of its ability to distinguish if a sample is from a non-normal distribution (Zahediasl, 2012).

The two tests stated above are used to differentiate the scores for the model in a normally distributed set of scores which have similar mean and standard deviation. A null hypothesis shows that the sample distribution is normal. When the test results are substantial, then the distribution of the data is considered as non-normal.

The findings for the data sets used in the study are indicated in Table 4.2 and Figure 4.1.

Table 4. 2: Normality test for the Dependent Variable

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Quality of Credit Portfolio	.189	40	.001	.910	40	.004
a. Lilliefors Significance Correction						

Thus, Table 4.2 shows that by utilizing both K-S and S-W tests for normality, the p-value for the two tests, was less than 0.05. Therefore, the findings of the research rejected the H_0 with a deduction being made that the statistical data for both the dependent and the independent variables was not normally distributed and therefore it aids in predicting dependent variables.

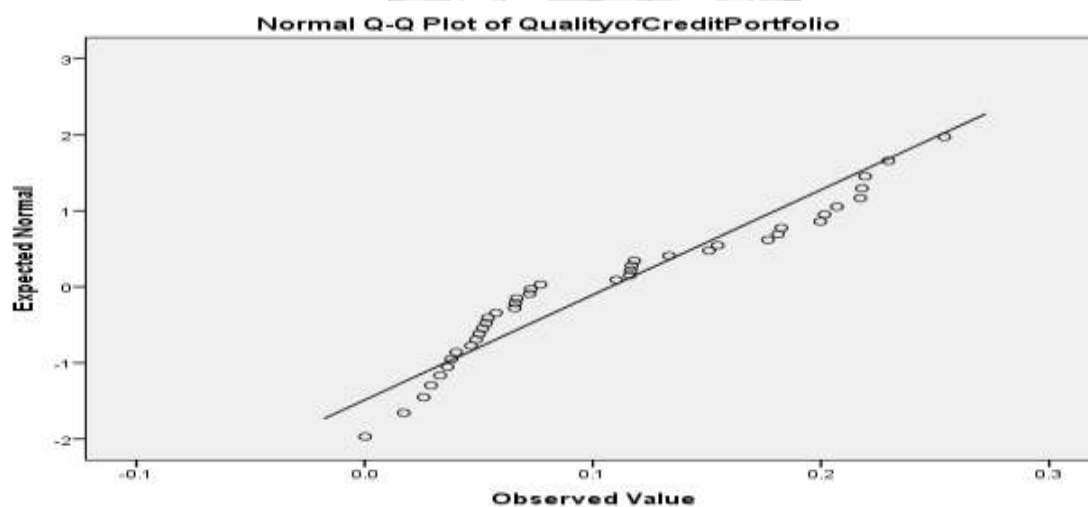


Figure 4. 1: Normality Test for the Dependent Variable

The test findings indicate that the normal Q-Q plot of the quality of credit portfolio had most of the values lying close to the 45° line and therefore the observed values for the quality of credit portfolio with the hypothetical distribution were concluded as normally distributed. Further, the Q-Q plots affirmed the normality of the data.

4.4.2. Multicollinearity Test

Multicollinearity, which is also denoted as collinearity is a phenomenon where one of the predictor variables in a multiple regression model could be linearly forecasted from the others with a significant level of exactness. In other words, it occurs when the independent variables in a regression model are observed as correlated (Frost, 2018). The coefficient estimate for the multiple regression may fluctuate erratically in response to minor changes in the data or the model.

The study utilized collinearity statistics for High Variance Inflation Factor (VIF) and Low Tolerance to determine if the independent variable is sufficiently correlated to show a significant causal correlation. These two statistical tools are reciprocals to other in that either there is higher VIF or a lower tolerance which is suggestive of multicollinearity. VIF evaluates the degree of the variance of the coefficient (such as its standard error) if it's being overstated because of multicollinearity. Tolerance can be defined as a degree of collinearity conveyed by most statistical programs like the SPSS with the variable of tolerance being $1 - R^2$. A slight tolerance value is indicative that the variable in the study is almost at a perfect linear blend of the independent variables already in the equation and that it should not be included to the regression equation. The VIF is $1/\text{Tolerance}$ and is greater or equal to 1. Values of VIF that surpass 10 are regularly viewed to as indicative of multicollinearity, but in weaker models, values above 2.5 may be a reason for concern (Frost, 2018).

Findings for the multicollinearity test are indicated in Table 4.2 below.

Table 4. 3: Multicollinearity Test Findings

Model		Collinearity Statistics	
		Tolerance	VIF
1	Total Savings	.869	1.151
	Cost of Savings	.854	1.171
	Capital Adequacy	.867	1.154
	Operational Costs	.839	1.192
	Bank Size	.813	1.108
	Profitability	.836	1.128
	Market Share	.862	1.109
	Real GDP	.831	1.118
	Central Bank Rate	.866	1.149
	Inflation Rate	.814	1.161
a. Dependent Variable: Quality of Credit Portfolio			

Based on the coefficients output, total savings had a VIF value of 1.151, cost of savings had a VIF value of 1.171, capital adequacy had a VIF value of 1.154 and operational costs had a

VIF value of 1.192. In addition, bank size had a VIF value of 1.108, profitability had a VIF value of 1.128, market share had a VIF value of 1.109, real GDP had a VIF value of 1.118, central bank rate had a VIF value of 1.149 and Inflation Rate had a VIF value of 1.161. The VIF values for the variables under the study were less than 10, which implies that there was little or no multicollinearity symptoms.

4.4.3. Autocorrelation Test

Autocorrelation can be defined as the level of correlation among values of similar variables across diverse observations in a statistical data. It is a scientific tool that represents the degree of likeness among a given time series and a lagged form of itself over consecutive time intervals (Smith, 2020).

The research utilized the Durbin-Watson (DW) test for autocorrelation. The DW tests produces a statistical result ranging from 0 to 4. Values that are closer to 2 (middle range) are indicative of a less autocorrelation, whereas values closer to 0 or 4 suggest either a greater positive or negative autocorrelation respectively (Smith, 2020). When the errors are correlated to one another, it shows that they are serially correlated. The Durbin-Watson test was conducted as indicated in the regression output of the model.

Findings are illustrated in Table 4.4.

Table 4. 4: Autocorrelation Test Results

	Durbin-Watson
Static	1.558

According to the findings of the test, the value of DW for the model was 1.558 which is distant from 2. Therefore, the null hypotheses were rejected for the model meaning there was a problem of autocorrelation.

4.4.4. Heteroscedasticity Test

Heteroscedasticity indicates whether the scatter is unequal or equal. In regression analysis, heteroscedasticity is discussed in the framework of the residual or the error term. Precisely, heteroscedasticity can be defined as the systematic change in the spread of the residuals over an array of measured variables (Frost, 2018). It is generally used in statistics, particularly in the framework of linear regression or when performing time series analysis, to evaluate if the variance of errors or of the model is not the similar to all observations, while regularly one of the rudimentary assumption in modelling is that the variances are similar and that the errors of the model are identically distributed.

Heteroscedasticity test determines if the variance of the dependent variable changes across the data set. It determines the hypothesis of equal variance. Levene's test was adopted to determine whether the model has equal variances. Equal variances across the model is referred to as homogeneity of variance. Other statistical tests like the analysis of variance (ANOVA), assumes that variances are identical across all samples or groups. The Levene test was adopted to validate this assumption. To determine for heteroscedasticity, the Levene's test was adopted whereby if P-value is < 0.05 , then it is indicative of a presence of non-uniform variance.

The test results for Levene test is indicated in Table 4.4.

Table 4. 5: Levene Test Results

	Levene Statistic	Df1	Df2	Sig.
Total of savings	0.183	1	212	0.021
Cost of savings	2.171	1	212	0.014
Capital adequacy	3.172	1	212	0.031
Operational costs	4.238	1	212	0.003
Quality of credit portfolio	1.211	1	212	0.047
Total of savings	2.331	1	212	0.034
Bank Size	0.283	1	212	0.002
Profitability	2.073	1	212	0.011
Market Share	2.972	1	212	0.003
Real GDP	3.208	1	212	0.001
Central Bank Rate	2.234	1	212	0.007
Inflation Rate	2.303	1	212	0.032

From these findings, the p-value for the variables under study (total of savings, cost of savings, capital adequacy, operational costs, total of savings, quality of credit portfolio, bank size, profitability, market share, real GDP, central bank rate and inflation rate) were less than 0.05 and therefore the null hypotheses for equal variances is rejected and a conclusion is made that the data set had no heteroscedasticity which is desirable for modelling of regression equation.

4.5 Trend Analysis

This section explores the trend of total of savings, cost of savings, capital adequacy and operational costs between 2009 and 2018.

The trend analysis findings are as shown in Figure 4.2.

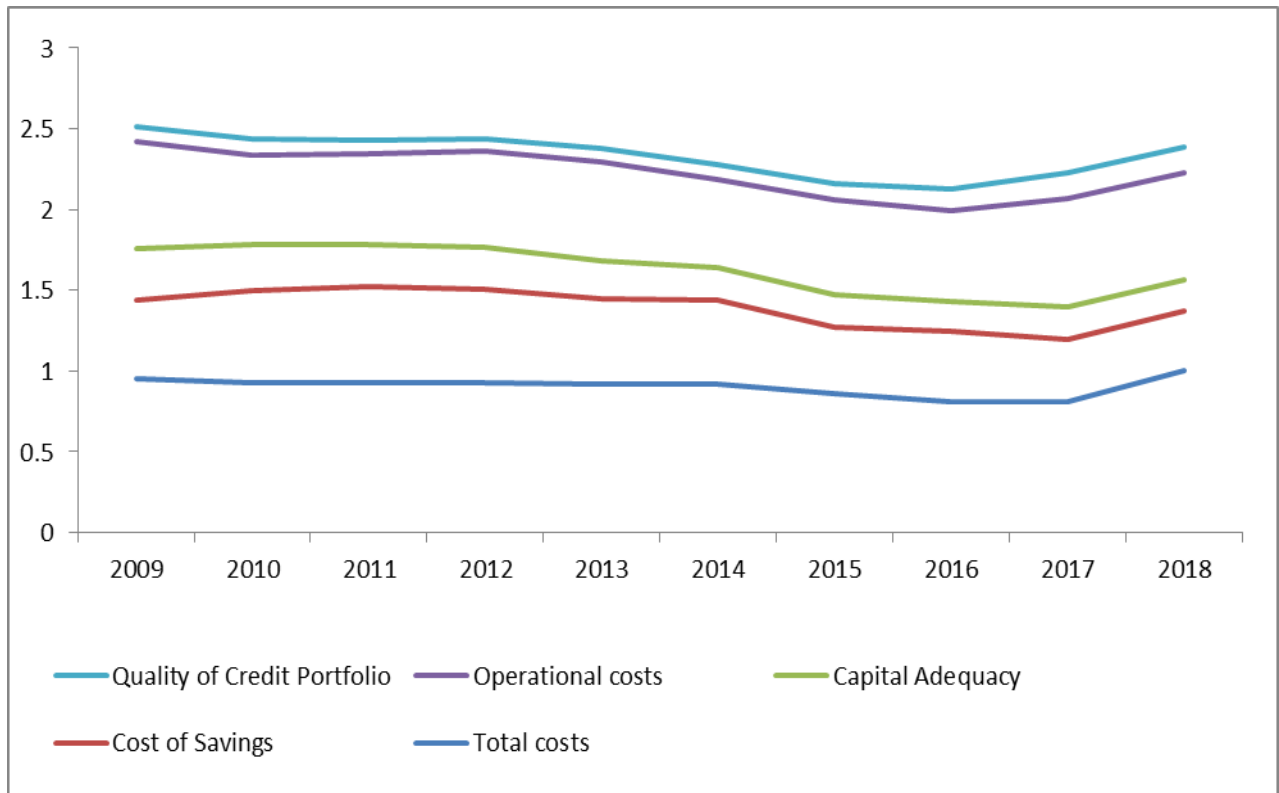


Figure 4. 2: Trend Analysis for Interest Rates Determinants and Quality of Credit Portfolio

From the findings, the data shows that ratios for total of savings, cost of savings, capital adequacy and operational costs as well as Quality of Credit Portfolio have been fluctuating between 2009 and 2018. For instance, both variables experienced increase of different magnitudes between 2017 and 2018. All the ratios for total of savings, cost of savings, capital adequacy and operational costs as well as Quality of Credit Portfolio decrease with various magnitudes between 2014 and 2015.

4.5 Correlation Analysis

Correlation analysis is a statistical tool that is used in evaluating the strength of an existing relationship between two or more quantitative variables (Iuliano, 2019). A correlation that is high means that two or more variables are strongly related to each other, while a correlation that is weak means that the variables are barely related. Therefore, it can be described as the process of examining the power of that relationship with the existing statistical data. When looking at the power of a relationship, the value of the correlation coefficient fluctuates

between +1 and -1. A value of ± 1 is indicative of a perfect degree of association between the variables under the study. As the correlation coefficient value moves towards 0, it means that the relationship between the variables is weak. The direction of the relationship is designated by the sign of the coefficient with a + sign indicating a positive relationship and a – sign indicating a negative or adverse relationship.

The Pearson correlation coefficient was used to examine the direction and strength of the relationship existing between the dependent and the independent variable. The examination done using the Pearson’s product moment correlation assumed that the data is normally distributed and that the variables are in a continuous form.

Figure 4. 3: Correlation Matrix

		QCP	TS	CS	CA	OC	BS	P	MS	RG	CBR	IR
QCP	Pearson Correlation	1										
	Sig. (2-tailed)	.										
TS	Pearson Correlation	.71	1									
	Sig. (2-tailed)	.023	.									
CS	Pearson Correlation	.611	.513	1								
	Sig. (2-tailed)	.027	.026	.								
CA	Pearson Correlation	.522	.423	.327	1							
	Sig. (2-tailed)	.028	.012	.018	.							
OC	Pearson Correlation	.672	.533	.520	.431	1						
	Sig. (2-tailed)	.042	.009	.002	.014	.						
BS	Pearson Correlation	.891	.598	.504	.370	.284	1					
	Sig. (2-tailed)	.008	.020	.009	.006	.016						
P	Pearson Correlation	.703	.561	.215	.162	.109	.022	1				
	Sig. (2-tailed)	.010	.006	.030	.017	.002	.004					
MS	Pearson Correlation	.630	.455	.369	.183	.106	.096	.051	1			
	Sig. (2-tailed)	.003	.041	.008	.009	.014	.004	.006				
RG	Pearson Correlation	.734	.193	.100	.183	.241	.699	.323	.229	1		
	Sig. (2-tailed)	.035	.032	.037	.008	.034	.000	.042	.006			
CBR	Pearson Correlation	.693	.102	.079	.092	.123	.349	.128	.200	.471	1	
	Sig. (2-tailed)	.032	.032	.027	.073	.051	.027	.030	.017	.002		
IR	Pearson Correlation	.599	.336	.074	.123	.366	.572	.207	.591	.575	.243	1
	Sig. (2-tailed)	.041	.034	.011	.001	.020	.000	.000	.000	.000	.031	

Where

QCP: Quality of credit portfolio

TS: Total of savings

CS: Cost of savings

CA: Capital adequacy

OC: Operational costs
BS: Bank Size
P: Profitability
MS: Market Share
RG: Real GDP
CBR: Central Bank Rate
IR: Inflation rate

The research calculated a single variable per factor by getting the averages of the total of savings, cost of savings, capital adequacy and operational costs. Pearson's correlations analysis was performed at a 95% confidence interval and 5% confidence level 2-tailed. The findings as per the table above shows the correlation matrix between the variables under study (total of savings, cost of savings, capital adequacy and operational costs) and quality of credit portfolio offered by commercial banks in Kenya.

As per the findings in the table, the relationship between quality of credit portfolio offered by commercial banks in Kenya and total of savings is positive as illustrated by the coefficient of 0.714, a positive relationship existing between quality of credit portfolio offered by commercial banks in Kenya and cost of savings as revealed by coefficient of 0.611, a positive relationship existing between quality of credit portfolio offered by commercial banks in Kenya and capital adequacy as proven by the coefficient of 0.522 and a positive relationship between quality of credit portfolio offered by commercial banks in Kenya and Operational costs as demonstrated by a coefficient of 0.672.

The findings showed that there is a positive relationship existing between quality of credit portfolio offered by commercial banks in Kenya and bank size as proven by the coefficient of 0.891, a positive relationship existing between quality of credit portfolio offered by commercial banks in Kenya and profitability as proven by the coefficient of 0.703, a positive relationship existing between quality of credit portfolio offered by commercial banks in Kenya and profitability as demonstrated by a coefficient of 0.630, a positive relationship existing between quality of credit portfolio offered by commercial banks in Kenya and real GDP as proven by the coefficient of 0.734 and.

In addition, the findings showed that there is a positive relationship existing between quality of credit portfolio offered by commercial banks in Kenya and central bank rate as proven by the coefficient of 0.693 and a positive relationship existing between quality of credit portfolio

offered by commercial banks in Kenya and inflation rate as proven by the coefficient of 0.599.

This indicates that all variables were significant in evaluating the influence of interest rates determinants on quality of credit portfolio offered by commercial banks in Kenya. The findings mean that total of savings, cost of savings, capital adequacy and operational costs are positively and significantly related to quality of credit portfolio offered by commercial banks in Kenya.

4.6 Pooled OLS Regression Analysis

Pooled OLS regression analysis is always used to forecast the values of a model that are based on the values of two or more other variables. It describes the existing relationship between multiple independent/predictor variables and one dependent/criterion variable. Pooled OLS regression examination was performed to determine the existing relationship between interest rates determinants and the quality of credit portfolio offered by commercial banks in Kenya. The findings of the multiple regression were illustrated in Table 4.7, 4.8 and 4.9.

Table 4. 6: Model Summary

Model	R	R Square	Adj R-squared	Root MSE
1	0.874	0.765	0.738	0.056

According to the results, the adjusted R-Square values which represents the coefficient of determination is 0.738. This shows that interest rates determinants such as total of savings, cost of savings, capital adequacy and operational costs explain 73.8% of the variation in the quality of credit portfolio offered by commercial banks in Kenya. This indicates that there are other interest rates determinants that influence quality of credit portfolio offered by commercial banks in Kenya were attributed to 26.2% unexplained.

Table 4. 7: ANOVA^a

	SS	Df	MS	F (10, 29)	Sig.
Regression	1.398	10	0.140	31.673	.000 ^b
Residual	0.128	29	0.004		
Total	1.526	39			

The results as illustrated in Table 4.9 reveal that the p-value was 0.000 and F calculated value was 31.673. Therefore, since the p-value was less than 0.05 and the F-calculated value was

greater than F-critical (2.1768) a conclusion is made that the overall model was statistically significant.

Table 4. 9: Regression Coefficients

Quality of credit portfolio	Coef.	Std. Err	t	P>[t]
Total of savings	0.743	0.293	2.536	0.016
Cost of savings	0.419	0.144	2.910	0.006
Capital adequacy	0.825	0.239	3.452	0.001
Operational costs	0.673	0.278	2.421	0.021
Bank Size	0.986	0.293	3.365	0.001
Profitability	0.778	0.144	5.403	0.000
Market Share	0.697	0.239	2.916	0.005
Real GDP	0.813	0.278	2.924	0.004
Central Bank Rate	0.767	0.104	7.375	0.000
Inflation Rate	0.663	0.156	4.250	0.000
_cons	0.981	0.814	1.118	0.027

The findings also indicated that if all factors (total of savings, cost of savings, capital adequacy and operational costs) were held constant at zero quality of credit portfolio offered by commercial banks in Kenya will be 0.981.

4.6.1. Total Savings against Credit Portfolio

The findings of the study demonstrate that when rest of the independent variables are at zero, a unit increase in total of savings would result to a 0.743 increase in credit portfolio. This variable is statistically significant because the p-value 0.016 was less than 0.05. This concurs with Islam (2019) who examined the impact of firms-specific variables and macroeconomic variables on the mobilization of deposits for private commercial banks in Bangladesh using panel data regression methodology and established that total deposit (as measured by company size) has significant negative impact on the deposit mobilization (as measured by banks deposit growth rate). The findings imply that total savings have a significant effect on credit portfolio offered by commercial banks in Kenya.

4.6.2. Cost of Savings against Credit Portfolio

The research findings of the research indicate that a unit increase in cost of savings would result to a 0.419 increase of credit portfolio offered by commercial banks in Kenya. This

variable was statistically significant because 0.006 is less than 0.05. This conforms to Mushtaq (2016) who did an empirical study on the impact of interest rate on bank deposits with evidence from Islamic and non-Islamic economies and established that in Islamic countries, the interest rate doesn't have any effect on the bank deposits though supply of money and inflation levels do have positive substantial impact. The findings imply that cost of savings have a significant effect on credit portfolio offered by commercial banks in Kenya.

4.6.3. Capital Adequacy against Credit Portfolio

The findings of the research indicate that when there is a unit increase of capital adequacy, the resultant effect would be a 0.825 significant increase in the credit portfolio since the p-value of 0.001 was less than 0.05. This is in line with Rivera (2017) who examined the credit risk and capital adequacy levels of 567 rural banks based in the Philippines and how both variables impact bank on the profitability. The author established that capital adequacy has no substantial effect on the profitability of commercial banks based in the rural areas of the Philippines. The findings imply that capital adequacy have a significant effect on credit portfolio offered by commercial banks in Kenya.

4.6.4. Operational Costs against Credit Portfolio

The findings of the research indicate that a unit increase of operational costs would significantly result to a 0.673 surge of credit portfolio offered by commercial banks in Kenya because the p-value of 0.000 was less than 0.05. This conforms to Simpasa (2014) who studied the determinants of bank lending rates in Zambia using panel regression techniques and established that lending rates are to a substantial extent affected by the variables relating to operating costs of the banks. The findings imply that operational costs have a significant effect on credit portfolio offered by commercial banks in Kenya.

4.6.5. Bank Size

The findings of the research indicate that a unit increase of bank size would significantly result to a 0.986 surge in the quality of credit portfolio offered by commercial banks in Kenya because the p-value of 0.001 was less than 0.05.

4.6.6. Profitability

The findings of the research indicate that a unit increase of profitability would significantly result to a 0.778 surge in the quality credit portfolio offered by commercial banks in Kenya because the p-value of 0.000 was less than 0.05

4.6.7. Market Share

The findings of the research indicate that a unit increase of market share would significantly result to a 0.697 increase in the quality credit portfolio offered by commercial banks in Kenya because the p-value of 0.005 was less than 0.05.

4.6.8. Real GDP

The findings of the research indicate that a unit increase of real GDP would significantly result to a 0.813 increase in the quality of credit portfolio offered by commercial banks in Kenya because the p-value of 0.004 was less than 0.05.

4.6.9. Central Bank Rate

The findings of the research indicate that a unit increase of central bank rate would significantly result to a 0.767 rise in the quality of credit portfolio offered by commercial banks in Kenya because the p-value of 0.000 was less than 0.05.

4.6.10. Inflation Rate

The findings of the study demonstrate that when rest of the independent variables are at zero, a unit increase in inflation rate would result to a 0.663 increase in the quality credit portfolio. This variable is statistically significant because the p-value 0.000 was less than 0.05.

4.7 Testing Random and Fixed Effects Using Panel Data Regression Model

In order to establish which estimation effects (between fixed and random) provided superior results for the study, Hausman test was carried out for each of the specified panel regression models. The test was conducted against the null hypothesis that random effect model was the preferred model. The test results rejected the null if the chi-square statistic was significant at 5% significance level; otherwise, the null was accepted.

Table 4. 8: Hausman Test Results

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	Fixed	Random	Difference	S.E
TS	-9.014	-5.031	-3.983	1.717
CS	-10.404	-6.405	-3.99	1.478
CA	-0.018	0.639	-0.639	0.329
OC	-0.029	-0.004	-.025	0.0026
BS	8.412	-7.411	-1.001	0.981
P	-0.716	0.608	-1.324	1.298
MS	1.028	-0.502	-0.526	0.515
RG	-8.462	-3.681	-4.781	0.685
CBR	1.313	0.619	-1.932	1.893
IR	-2.021	-0.217	-1.804	1.768

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2}(4) = (b-B)'[(V_b-V_B)^{-1}](b-B)$$

$$= 12.94$$

$$\text{Prob}>\text{chi2} = 0.01$$

Table 4.16 displays the Hausman specification test results for panel regression model. The test results show that the chi-square statistics for panel regression model was statistically significant at 5% level as supported by the p-values of 0.01. The study therefore failed to reject the null hypothesis that the fixed effects estimation was appropriate for panel regression model at 0.05 significance level. The study concludes that the panel data exhibited fixed effects.

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The aim of the research was to investigate the influence of interest rates determinants on the quality of credit portfolio offered by commercial banks in Kenya. This chapter presents the summary of findings, conclusion, and recommendations from the study.

5.2 Discussion of Findings

The study further found out that interest rates determinants such as total of savings, cost of savings, capital adequacy and operational costs explain 73.8% of the variation in the quality of credit portfolio offered by commercial banks in Kenya. Generally, it was established that capital adequacy had the greatest effect on the quality of credit portfolio offered by commercial banks in Kenya, followed by total savings then operational costs while cost of savings had the least effect to the quality of credit portfolio offered by commercial banks in Kenya

5.2.1 Total Savings

According to the findings of the study the mean for ration of total savings was 0.9063 while its standard deviation was 0.1207. The findings also showed that a unit increase in the total of savings would lead to a 0.743 increase in quality of credit portfolio offered by commercial banks in Kenya. While savings are a key backbone of the private sector credit, its levels of growth is dependent on the rate of interest, inflation, growth of the economy, remittance inflows and money in flow (Olokoyo, 2011).

These findings support Olokoyo's (2011) research findings that indicate that investment portfolios, level of deposits, and liquidity ration have considerable impact on lending volumes. In his study, Olokoyo's (2011) determined that there was a causal relationship between savings and lending volumes. High lending volumes in turn have a substantial effect on the quality of credit portfolio of commercial banks as the analysis shows that there is an increase in 0.743 increase in quality of credit portfolio offered by commercial banks in Kenya.

The findings also concur with Islam (2019) who examined the impact of firms-specific variables and macroeconomic variables on the mobilization of deposits of private commercial banks in Bangladesh using panel data regression methodology. He established that total

deposit measured by company size has significant negative impact on the deposit mobilization as measured by banks deposit growth rate.

The study provides evidence that a relationship exists between total savings and the quality of credit portfolio offered by commercial banks as we have seen, a unit increase in the total of savings leads to a 0.743 increase in quality of credit portfolio.

The findings are in line with Classical Theory also referred to as capital theory of interest, the saving-investment theory of interest or the real theory of interest because it is hinged on the variables of supply and demand forces in the economy and is relevant to this study as highlights the influence total savings and cost of savings on the quality of credit portfolio offered by commercial banks in Kenya.

5.2.2 Cost of Savings

The study revealed that the mean for ration of cost of savings was 0.4870 while its standard deviation was 0.1664. The study found that a unit increase in cost of savings would lead to a 0.419 increase of quality of credit portfolio offered by commercial banks in Kenya.

The findings support a study by Schnitzel (1986) who avows interest rates are impacted by the deposit rates during the regime period that the deposit rate was regulated. This has a direct impact on the quality of credit portfolio as most of the cost incurred by the banks is transferred to consumers and therefore there is a high affinity for default.

These findings also conform to Mushtaq (2016) who did an empirical study on the effect of the rate of interest on bank deposits with evidence from Islamic and non-Islamic markets and established that in Islamic economies, interest rate does not have any effect on the banks' deposits, however, supply of money and inflation levels do have positive substantial effect. But for the case of non-Islamic economies, both the interest rate and supply of money have positive substantial effect on the banks' deposit however, inflation levels appear to be insignificant.

From the findings, we can deduce that a unit increase in cost of savings would lead to a 41.9% increase of quality of credit portfolio offered by commercial banks in Kenya. This can be translated to mean that there is an existing causal relationship between cost of savings and quality of credit portfolio.

The findings are in line with Classical Theory also referred to as capital theory of interest, the saving-investment theory of interest or the real theory of interest because it is hinged on the variables of supply and demand forces in the economy and is relevant to this study as highlights the influence total savings and cost of savings on the quality of credit portfolio offered by commercial banks in Kenya

5.2.3 Capital Adequacy

The study established that the mean for ration of capital adequacy was 0.2312 while its standard deviation was 0.1309. The study found that a unit increase of capital adequacy would lead to a 0.825 significant increase of quality of credit portfolio offered by commercial banks in Kenya since p-value (0.001) was less than 0.05.

These findings are support the study done by Cihak (2004) from Croatia who found out that capital adequacy has a dissimilar impact on lending rates from the one on interest spreads. The author states banks that have a high capital adequacy usually have low lending rates. This in turn has a huge increase in the level of bad and doubtful debts in the portfolio of commercial banks. The level of bad and doubtful debts is one of the measures of the quality of credit portfolio.

Closer home in Tanzania, there is coverage with Lotto (2018) who concluded that that capital adequacy strengthens the financial stability and soundness of a bank by provisioning of a greater capital cushion and moreover it improves the banks' operating efficiency by averting a moral hazard problem that may exist between debtholders and shareholders. The findings support the study by Nzioki (2011) who analysed the impact of capital adequacy on financial performance for commercial banks that are quoted at the NSE. The findings of his study indicate that adequacy of capital, the percentage of borrowings as equated to deposits and the ratio of credit to deposit levels signify the soundness of a bank. He goes on to state that the capital base of a financial organization enables depositors to form a perception about the risk levels of the institution.

We can conclude that there is a significant relationship between capital adequacy and the quality of credit portfolio as a unit increase of capital adequacy would have a resultant effect of a 0.825 or 82.5% significant increase of quality of credit portfolio since p-value (0.001) was less than 0.05.

These findings were in line with Keynes Liquidity Theory which was developed by John Maynard Keynes in 1891 and is founded on the theory of Economic Growth which states that value of money can be used for both transaction motive and as a store of wealth motive and the theory is relevant to this study as it highlights the influence of capital adequacy on the quality of credit portfolio offered by commercial banks in Kenya

5.2.4 Operational Costs

In addition, the study established that mean of ratios for operational costs was 0.6013 and its standard deviation was 0.3021. The research further established that a unit increase of operational costs would significantly lead to a 0.673 increase of quality of credit portfolio offered by commercial banks in Kenya since p-value (0.000) was less than 0.05.

These findings concur with the empirical research done by Onuko (2015) which analysed the quality of loan portfolio as the dependent variable and loan pricing as the independent variable. The findings of the research indicated that loan pricing has a positive effect on non performing assets.

The findings also conform to Bredl (2018) who states that there is a positive relationship between net non performing loans and lending interest rates. Regionally in Namibia, the findings by Sheefeni (2016) on the impact of interest rates spread on non performing assets in Namibia indicates that interest rate spread does have a positive and statistically substantial impact on non-performing loans. This suggests that an increase in interest rates margins has the possibility of raising the likelihood of loan default by customers. The research was critical of Namibia since there is a high concentration of assets that are of mortgage loans which is where they derive most their profits. The greatest risk here is that any act involving manipulation of profit margins would result to an increase in the likelihood of loan defaults by clients.

We can therefore conclude that there is a relationship existing between operational cost and the quality of credit portfolio because a unit increase of operational costs would significantly lead to a 67.3% increase of quality of credit portfolio offered by commercial banks in Kenya. These findings were in line with Loanable funds theory originated from economist Knut Wicksell based in Sweden and was later developed by Ohlin (1937) and this theory is relevant to this study as it highlights the influence of operational costs on the quality of credit portfolio offered by commercial banks in Kenya.

5.2.5 Control and Moderating Variables

The study established that a unit increase of bank size would significantly result to a 0.986 surge of credit portfolio offered by commercial banks in Kenya, that a unit increase of profitability would significantly result to a 0.778 surge of credit portfolio offered by commercial banks in Kenya and that a unit increase of market share would significantly result to a 0.697 surge of credit portfolio offered by commercial banks in Kenya. In addition, the study found that a unit increase of real GDP would significantly result to a 0.813 surge of credit portfolio offered by commercial banks in Kenya and that a unit increase of central bank rate would significantly result to a 0.767 surge of credit portfolio offered by commercial banks in Kenya.

5.3 Conclusions

While lending is essential to commercial banks' performance globally, maintaining a good quality credit portfolio sustainably remains a key challenge. Interest income generated on loans advanced by commercial banks affects their performance and constitutes a significant component of their asset. Bad and doubtful loans accrue liabilities which impacts banks negatively in their performance, operations as well as the general economy. The quality of credit portfolio influences the ability of commercial banks to lend to its customers in a sustainable manner. Interest rates determinants influences the quality of credit portfolio offered by commercial banks.

Generally, the findings of the study concluded that among the interest rates determinants, capital adequacy had the greatest effect on the quality of credit portfolio offered by commercial banks in Kenya, followed by total savings then operational costs while cost of savings had the least effect to the quality of credit portfolio offered by commercial banks in Kenya.

Basically, interest rates determinants such as total of savings, cost of savings, capital adequacy and operational costs significantly influence the quality of credit portfolio offered by commercial banks in Kenya. As per the research findings a unit increase in the total of savings would lead to a 0.743 increase in quality of credit portfolio offered by commercial banks in Kenya. It also implies that a unit increase in cost of savings would lead to a 0.419 increase of quality of credit portfolio offered by commercial banks in Kenya and that a unit increase of capital adequacy would lead to a 0.825 significant increase of quality of credit portfolio offered by commercial banks in Kenya. It further implies that a unit increase of

operational costs would significantly lead to a 0.673 increase of quality of credit portfolio offered by commercial banks in Kenya since p-value (0.000) was less than 0.05.

The study concluded that bank size, profitability, market share and real GDP significantly result to surge of credit portfolio offered by commercial banks in Kenya. The study also concluded that a unit increase of central bank rate would significantly result to a surge of credit portfolio offered by commercial banks in Kenya.

5.4 Recommendations

5.4.1 Recommendations for Policy

The research recommends that the Kenyan government, through the monetary authority that is the CBK should be involved in formulating policies and regulations that would guide financial institutions in optimizing their interest rate spreads which will encourage uptake of loans as well as improving the performance of commercial banks. Increased uptake of loans will have a resultant effect of economic growth of the country.

The study recommended that to improve quality of credit portfolio, commercial banks should grow their loan portfolios. Nevertheless, such growth should be tactically implemented to minimize the problem of non-performing loans in subsequent years. Commercial banks should also exercise care in lending during all periods to avoid overreacting to loan losses caused by bad loans. The research recommends that branch managers should re-evaluate the significance of their loan portfolio diversification which will aid in reducing the problem of bad loans.

The study recommends that in their mandate of ensuring financial stability, the central bank should aim to regulate interest rate levels through monetary policies. Monetary policies that result in low interest rates on bank loans translate to improvements in the performance of the economy including the equity market. Improved equity market performance will attract foreign investments in the country and thus further improving investments in the country.

5.4.1 Recommendations for Practice

The management of the commercial banks should encourage their customers on the need to increase the total savings as they reduce the cost savings and operational costs so as to increase and enhance the quality of credit portfolio offered by commercial banks in Kenya.

The study recommends that banks should maintain assets of high quality as this has a positive effect on financial performance. Banks should diversify their loan portfolio as this was found

to be an important determinant of loan portfolio quality. Commercial banks should also pay attention to borrowers' credit history during periods of economic expansion.

The study recommends that banks should increase their core capital base since measure of capital adequacy showed that banks with high capital adequacy ratios perform better financially. The amount of statutory capital required for commercial banks should be increased. Further to enhance lending banks should consider increasing their capital base.

5.5 Limitations of the Study

The study was limited to secondary data. The major limitations of this study with relative to data availability, the data was tedious to collect and compute as it was in its very raw form. Due to lack of standardization of financial statements from various commercial banks in Kenya, data computation was made even harder. In addition, time and resources allocated to this study could not allow the study to be conducted as deeply as possible in terms of other interest determinants.

5.6 Areas for Further Research

The focus of this study was on the influence of interest rates determinants on the quality of credit portfolio offered by commercial banks in Kenya. Therefore, the study recommends that the study should be extended to cover both commercial banks and micro finance institutions.

The study also recommends future studies to focus on the influence of interest rates determinants on the quality of credit portfolio offered by Micro finance institutions and SACCOs in Kenya.

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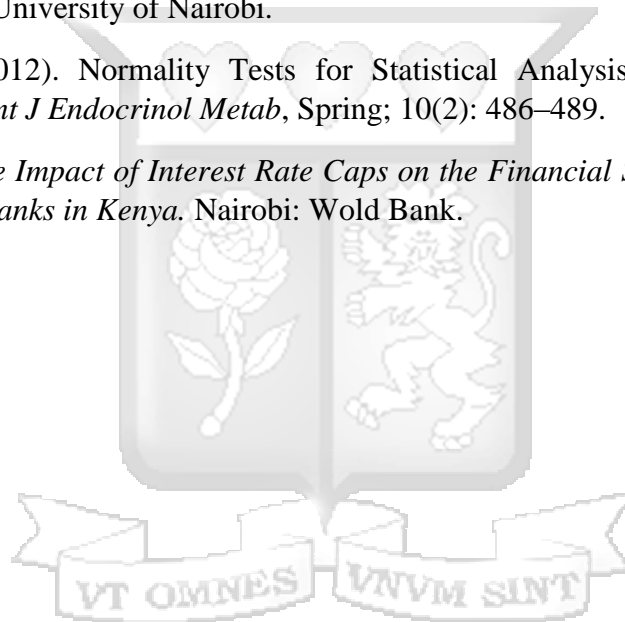
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APPENDICES

APPENDIX 1 – Letter of Introduction from Strathmore University Business School

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



Friday, 29 May 2020

RE: FACILITATION OF RESEARCH – BRIAN CHITALA OMBITO

This is to introduce Brian Chitala Ombito who is a Master of Science in Development Finance student at Strathmore University Business School, admission number MDF 58422 /17. As part of our MDF Program, Brian is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MDF course. To this effect, he would like to request for appropriate data from your organization.

Brian is undertaking a research paper on “**INFLUENCE OF INTEREST RATES DETERMINANTS ON THE QUALITY OF CREDIT PORTFOLIO OFFERED BY COMMERCIAL BANKS IN KENYA.**” The information obtained from your organization shall be treated confidentially and shall be used for academic purposes only.

Our MDF seeks to establish links with industry, and one of these ways is by directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

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

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Veronica Muniu".

Veronica Muniu,
Manager | Graduate Programmes, Strathmore University Business School

APPENDIX 2 – Ethical Approval



18th June 2020

Mr Chitala, Brian
brianchitala@gmail.com

Dear Mr Chitala,

RE: Influence of Interest Rates Determinants on The Quality of Credit Portfolio Offered by Commercial Banks in Kenya


This is to inform you that SU-IERC has reviewed and **approved** your above research proposal. Your application approval number is **SU-IERC0824/20**. The approval period is **18th June 2020 to 17th June 2021**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 72 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 72 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://oris.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely,







for Dr Virginia Gichuru,
Secretary; SU-IERC

Cc: Prof Fred Were,
Chairperson; SU-IERC



Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email info@strathmore.edu www.strathmore.edu

APPENDIX 3 – Research License from NACOSTI

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 170269	Date of Issue: 09/June/2020
RESEARCH LICENSE	
	
This is to Certify that Mr.. Brian Chitala of Strathmore University, has been licensed to conduct research in Nairobi on the topic: Influence of Interest Rates Determinants on the Quality of Credit Portfolio offered by COmmercial Banks in Kenya for the period ending : 09/June/2021.	
License No: NACOSTI/P/20/5154	
170269 Applicant Identification Number	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
	Verification QR Code 
NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.	

APPENDIX 4 – List of Commercial Banks in Kenya

1. ABC Bank (Kenya)
2. Absa Bank Kenya Plc
3. Bank of Africa
4. Bank of Baroda
5. Bank of India
6. Citibank
7. Consolidated Bank of Kenya
8. Cooperative Bank of Kenya
9. Credit Bank
10. Development Bank of Kenya
11. Diamond Trust Bank
12. Dubai Islamic Bank
13. Ecobank Kenya
14. Equity Bank
15. Family Bank
16. First Community Bank
17. Guaranty Trust Bank Kenya
18. Guardian Bank
19. Gulf African Bank
20. Habib Bank AG Zurich
21. Housing Finance Company of Kenya
22. I&M Bank
23. Imperial Bank Kenya (In receivership)
24. Jamii Bora Bank
25. Kenya Commercial Bank
26. Mayfair Bank
27. Middle East Bank Kenya
28. M Oriental Bank
29. National Bank of Kenya
30. NCBA Bank Kenya
31. Paramount Universal Bank
32. Prime Bank (Kenya)
33. SBM Bank Kenya Limited
34. Sidian Bank
35. Spire Bank
36. Stanbic Bank Kenya
37. Standard Chartered Kenya
38. Transnational Bank
39. United Bank for Africa
40. Victoria Commercial Bank

Source: CBK (2018)