EFFECT OF INFLATION ON THE LOANS DEFAULT RATE OF COMMERCIAL BANKS IN KENYA.

BY

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DECLARATION

This project is my original work and has not been presented for the award of degree in any other University.

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DEDICATION

This project is dedicated to my parents for their unwavering support in every step I have taken and decision I have made. I also dedicate this work to my brother Mohamed, who has sacrificed so much for me to be where I am today. I will always be grateful to him for believing in me. I will never be able to thank him enough for the chances he provided. I would like to dedicate this research to my brother Abdullah, who has always encouraged and supported me in my endeavors. Thank you to my entire family, as well as my nibbling AMIRA, ABDIRAHMAN, ABDIRAHIN, MOHAMED, and ABDIRASHIID. My affection for you all is unquantifiable. God be with you.

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ABSTRACT

The study aimed at identifying the effect of inflation on loan default rate. Other independent variables that comprised of macroeconomic variables were identified by the study and their effects on loan default rate were also investigated. The data collected involved quarterly data for each variable for a period of twenty years, and an ordinary least squares (OLS) method was identified as the tool of analysis. Data analysis that was undertaken first involved describing main characteristics of each variable as it expressed the variable's mean and standard deviation. Diagnostic tests were also undertaken in the study to ensure that conditions required for use of OLS were complied with. However, the variables failed on a number of tests that necessitated the data to be treated through standardization. The study also preferred the use of non-parametric tests instead of use of parametric tests. The correlation analysis undertaken by the study found that both inflation and economic growth had significant and negative correlation on loan default rate, which indicated that an increase in inflation as well as an increase in economic growth would lead to a decrease in loan default rate as inflation would make loans relatively cheap while economic growth would ensure that borrowers are able to make good income and therefore oblige to their financial obligations. Exchange rate fluctuations and lending interest rates had positive correlation though exchange rate fluctuations had almost zero correlation against loan default rate. The regression analysis that was undertaken by the study indicated that the model adopted by the study was only able to describe 18.6% of the changes in loan default rate. Other changes in loan default rate were therefore explained by other factors that were not in the model. The p value of the F test undertaken was less than 0.05 that led the null hypothesis to be rejected and the study concluded that there was significant effect of inflation on loan default rate for banking sector in Kenya. Therefore, the study recommends that the government should implement policies that will keep inflation under control. The study would also advise the government to implement policies that are likely to boost and improve economic growth. The study also suggests that the government refrain from encouraging increased exchange rate fluctuations.

ABBREVIATIONS AND ACRONYMS

CBK   Central Bank of Kenya

CBK   Central Bank of Kenya

CEE   Central and Eastern European

CMA   Capital Markets Authority

CPI   Consumer Price Index

EAC   East African Countries

EG   Economic Growth

ERV   Exchange Rate Volatility

FDI   Foreign Direct Investments

GDP   Gross Domestic Product

IMF   International Monetary Fund

IRA   Insurance Regulatory Authority

KNBS   Kenya National Bureau of Statistics

NPL   Non-Performing Loans

RBA   Retirement Benefits Authority

R&D   Research and Development

TFP   Total Factor Production

UNCTAD   United Nations Conference on Trade and Development

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

According to Kelly (2021), inflation happens when there is a general increase in the price of products and services, as well as a decline in buying power. The worth of a currencies when represented in terms of the market basket that one unit of something like the currencies can purchase is referred to as purchasing power. Inflationary impacts have been proven to be closely related to money supply. As a result, a rise in the amount of money available means an increase in the product price in general. On the other hard default rate in commercial banks have been on the rise across the globe. Different authors; Anjom and Karim (2016), Hanifan and Umanto (2017) among others have considered the rate at which loan default rates in commercial banks have been on the rise. The increase on loan default rate suggests that borrowers are not able to meet their financial obligations of paying the principal plus the interest rates borrowed from the commercial banks. This also indicates that the rate of return that is generated by current investments from such borrowers is below the required rate of return and the projects that they undertake have negative NPV.

This study will be premised in a number of propositions that have been undertaken previously and which would stand as theories that support inflation and influence on default rate in commercial banks. Monetary theory of inflation is an anchor theory of the study that suggests that the growth in money supply is the cause of inflation and as such the faster the rate at which money supply grows in an economy, the same case influences increase in inflation. The theory suggests that the price level is a function of money supply, the velocity of money supply as well as the level of

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income (Ali & Bilquees, 1996). The other hypothesis is the authentic theory economic interest, which claims that real economic factors drive the real interest rate and was initially proposed by Irving Fisher. Changes in the number of inflation would consequently have an influence on the local interest rate, causing the debt burden to rise or fall, affecting loan. The classical Quantity Theory of Money focuses on the relationship between the rate of change in the cash stock and inflation; as a result, the quantity theory of money indicates that the cash supply has an instantaneous impact on the price level. Monetarist Theory on the other hand contends that cash is an immediate substitute for every other asset. Therefore, an increase in the supply of cash, in the circumstance of a steady velocity circulation, will affect need for different resources, and would eventually cause an increase in general prices.

Increase in inflation benefits borrowers who had borrowed on interest rates. Lenders on the other hand lose their purchasing power from their interest earning investment since the real value of the amount received becomes less due to inflation. A positive effect because of increase in inflation rate therefore is experienced by the borrowers who enjoy a relief on their repayments occasioned by inflation. This implies that if an individual borrows a loan at say 14% and the inflation rate increases by 4%, the effective cost of the loan becomes 10%. However, most lenders undertake their due diligence in trying to predict future inflation rate, they therefore take into account the inflation risk by with the inclusion of a premium on the inflation in the costs of loaning out of funds. Lenders will therefore be adversely affected by increase in unexpected inflation in the country. Given the new challenges in banking and the ascent in non-performing advances (NPLs) there is reestablished concern in the effect of inward and outside factors on NPLs of banks. Monetary institutions and all the more explicitly the financial sector is confronted with a variety of dangers, for example, liquidity risk, market risk, and operational risk credit among others. Credit

risk is distinguished as one of the most established and significant risk factors that banks and other monetary organizations have been suffering from every now and then. Fernández de L., et al., (2002), recognized that non-performing advances are known to curtail organizations performance and furthermore lead to monetary crises. Central Bank of Kenya (2010), characterized non - performing advances as credits whose main installment and premium are not met by the borrower/client, and identifies the period for deciding if an advance has become non-performing under global standards to be 45 to 90 days, however, this might vary in various nations like in India where it is 180days..

1.1.1 Inflation in Kenya

Inflation can be described as a general increase in the cost of goods and services in a nation within a specific period of time (Nanteza, 2015). The Consumer Price Index (CPI) proxies the inflation in an economy. Alternatively, inflation/deflation is the change in general prices (Ramasamy & Abar, 2015). High inflation levels increase the capacity of a borrower to repay a loan through reducing the actual value of the outstanding debt. In addition, if salaries or wages remain constant, an increase in inflation can reduce a borrower's loan repayment capacity by reducing real income (Tsumake, 2016). Therefore, increment in inflation levels may lead to increase in the ability of borrowers to make payment through reducing the real value of money (Klein, 2013). The current study is going to utilize inflation measured by inflation rate, which is calculated by the annual percentage change over the period of the general price index CPI.

1.1.2 Loan Default Rate

Default risks emerges in case where there is a likelihood of either a partial or a full loan repayment not being made as stated in the loan agreement with the lending company. The Basel Committee

on Banking Supervision (1997) defines default risk as the risk that a lender would lose money if a borrower fails to fulfill pledged payments. Default risk is defined by the committee as the possibility that a creditor or borrowing may fail to satisfy their commitments in line with the current agreement. Default risk is defined as the possibility that the actual return on an investment or advance credit would differ from what was expected (Tsai & Huang, 1997). Default risk, according to Khalid (2012), is defined as losses sustained due to borrowers' reluctance or inability of making timely and fully repayment of the due amounts leading to reclassification of the issued loan as a non-performing loan. In accordance with Conford (2000) NPLs refers to any loan that is in arrears over a period of more than three months for the interest earned and principal payments or over three months for which Payment that has been refinanced, capitalized, or delayed by agreement and for which payment is not yet three months overdue but is no longer expected. According to the International Monetary Fund (IMF), an NPL is a loan with a maturity date that has passed but a portion of the loan sum that has not been paid. According to Ahmad and Ariff (2007), NPLs are the percentage of loan values that are 90 days or more past due.

Banks should take all measure possible in order to reduce loan delinquency. As a result, it is necessary to conduct individual exposure checks on a regular basis in order to monitor loan quality on a regular basis (Ahmad & Ariff, 2007). The banks' liquidity is damaged and has an adverse effect on their income due to non-performance of loans. The customer's deposit is also threatened. The failure to pay loans means that other borrowers are unable to reuse money (Conroy, 2003). Both the borrowers and the lenders are affected by the cost of delinquencies of loans according to Gorter and Bloem (2002). Loss of interest, legitimate expenses, the chance expense of the chief sum, and different uses are remembered for the bank's expenses. For the borrowers, the choice to default is a tradeoff between the outcomes as far as lost standing and the chance expense of

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ignoring the interests to fund the current obligation. Since advances are a significant resource on a bank's accounting report, a bank's credit hazard the board achievement is generally controlled by the extent of nonperforming advances (NPLs) to net loaning, otherwise called the NPL proportion. A high NPL to advance ratio indicates bad loan payback as a result of unreasonable lending practices and deteriorated credit management. Since a low ration indicates good default rate, it is henceforth appropriate (Thygerson, 1995). In this study, the NPL ratio will be used as a default rate indicator.

1.1.3 Inflation and Loan Default Rate

In various literature sources, there is significant distinction amongst factors that affect banking credit risk, factors affecting unsystematic credit risks and those affecting systematic credit risks. Specific borrower factors affect the unsystematic credit risk. Macroeconomic factors such as employment rates, economic growth, exchange rate variation, stock indices and inflation rates affect the systemic credit risk (Castro, 2013). Teker, Pala, and Kent (2013) states main systemic variables in credit risk that include of nine economic factors; Balance of payments, inflation rate, GDP per capita, debt to GDP, fiscal balance, international reserves, export growth rate, exchange rate, financial depth and efficiency and three political factors which are corruption levels, government effectiveness and political stability.

Prochniak (2011) states prior to the global financial crisis, the loan portfolio of banks had an increasing trend across various countries. There was a growing demand for the loans due to the growth of the economy and higher expectations from households, business and banks. However, the credit drop following the global crisis was as difficult as growth in times of credit boom. As a result of the weakening economy due to the financial crisis banks encountered a mirage of

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problems in NPLS because most of the borrowers could not be able to fulfil their financial obligations. The decline in GDP, investments, household consumption expenditures, the rise in business bankruptcies, and unemployment posed major challenges to banks, household and business owners. Additionally, the loan portfolio quality as wells as the financial indicators of banks deteriorated which shown that banks failed to properly assess credit risk during the credit boom period. Banks, as financial intermediaries, play an essential role in a country's financial system and overall economy. As a result, bank supervisors were concerned about these issues. The Basel III Agreement established criteria for considering macroeconomic factors when assessing credit risk. In order to construct exact internal credit risk assessment models Banks can choose the variables and analytical methodologies they want to use (Prochniak, 2011).

A close interrelationship between banking crisis, bank credit and business cycles exist. Often deep and long-term recessions accompanied the financial crises. As indicated by financial instability hypothesis, the economy may be pushed to the brink by a prolonged period of prosperity that could lead to speculative euphoria and excess borrowing. During the recent global financial crisis, this viewpoint gained popularity, challenging consensus macroeconomic models based on rational behaviour of agents (Bucher, Dietrich, & Hauck, 2013).

The economic expansion faces, there are minimal NPLs since individuals and companies normally have enough sources of income and revenues enough to enable them service their loans. However, while the booming period prolongs, credit is provided even to lower-quality debtors, and as a result, the NPLs rises when the recession phase begins (Steiner, 2014). Unemployment rates may give further insight on the effect of economic conditions. As the unemployment rates rises there is an adverse effect on the cash flows of households, which as a result lead to increase in their debt

burden. In the perspective of companies, an increase in employment rate may signal a reduction in production following a reduction in the effective demand. This could reduce revenues and cause debt fragile conditions (Castro, 2013).

1.1.4 Commercial Banks in Kenya

The Kenyan banking sector is regulated by the Central Bank of Kenya (CBK), the Banking Act, and the Companies Act. The CBK is given the mandate of financial policies formulation and implementation, managing the banks liquidity, credit worthiness as well as maintain a proper monetary policy system. Commercial banks are financial institutions that are licensed by the CBK for accepting deposits and issuing loan advances to their clients (Githaiga, 2015). As at June 30 2018, in Kenya there were 43 licensed commercial banks and one mortgage finance bank. Thirty banks were owned by locals while 13 were foreign owned.

The Government of Kenya in the quest of ensuring asset quality has indeed made significant changes to both the Banking Act (Cap 488) and also on the prudential Guidelines as a way of improving the provisions associated to bank license, capital adequacy, risk asset classification, risk management in general and even corporate governance (Thorsten et al, 2009). Owing to the strong emphasis on asset quality, banks have been subjected to tight monitoring and restrictions since 2001, when the NPL ratio peaked at 22.6 percent, in order to ensure that ratios remain within acceptable limits, resulting in improved asset quality higher profitability levels from the loan portfolio (Oloo, 2013). Both global and local financial crises have affected Kenya's banking industry in the past. During the year 1980 and 2000, the financial industry in Kenya was branded with major financial disturbances, which ended with the collapse of a number of banks and other being taken under receivership (Muriithi & Louw, 2017). Three commercial banks in Kenya were

placed under receivership from the year 2015 which has led to many people losing trust with banks and the overall industry (AIB Capital, 2016). The Kenyan banking sector has experienced an increase in defaults rise in defaults. According to the CBK supervisory report (2020), there has been a steady increase of NPLs from the year 1997 when they stood at KES 56 billion to date to KES 83 billion in1998, KES 97 billion in 1999, and in the year 2019 the NPLs stood at KES 329.7 billion. Based on Kenya's experience since financial liberalization in 1993 with the financial reform process, NPLs continue to increase steadily, acting as a hindrance to the financial sector's expansion which consequently translate to adversely impacting the country's economic growth. the Central Bank of Kenya (CBK) efforts via fiscal policies have performed a significant role in market stabilization, although sometimes there is unexpected developments in the banking sector resulting from these interventions. In comparison with 20.08% in December 2013, for instance, private-sector annual lending growth appeared to stagnate in January 2014 at 20.47% (FSD, 2014).

1.2. Statement of the Problem

The demand for credit is normally higher in the economic boom period rather than in recession period owing to the nature of business cycle. (Anila, 2010). Many economists view credit growth positively since it suggests a strong banking sector and a stable macroeconomic environment. The quality of loans, on the other hand, can be affected by excessive credit expansion. The negative consequences after a period of loan boom were due to poor loan quality and minimal supervision and among other factors (Babouček & Jančar, 2005). Borrowers and banks are widely recognized in this stage as being overconfident about the projects for investment and the capacity of repaying loans. The optimism of banks regarding future prospects for borrowers brings more liberal lending policies with reduced lending standards requirements. As a results, this leads to banks experiencing high levels of NPLs and provisions in the recession period when they are required to have strict

credit policies and better prospects of reviving the economy of a country. Those lending fluctuations are more than proportional to economic changes, demonstrating that changes in bank loans tend to intensify the business cycle (Bouvatier, Lopez-Villavicencio & Mignon, 2012).

Based on Kenya's experience since financial liberalization in 1993 with the financial reform process, NPLs continue to increase steadily, acting as a hindrance to the financial sector's expansion which consequently translate to adversely impacting the economic growth of Kenya. CBK's fiscal policies initiatives have performed a key role in market stabilization, these actions sometimes lead to unforeseen events in the banking industry. In comparison with 20.08% in December 2013, for instance, private-sector annual lending growth appeared to stagnate in January 2014 at 20.47% (FSD, 2014). According to the CBK supervisory report (2020), there has been a steady increase of NPLs from the year 1997 when they stood at KES. 56 billion to date to KES 83 billion in1998, KES 97 billion in 1999, and recently in the year 2019, the NPLs stood at KES 329.7 billion. In Kenya, the high proportion of NPLs remains a major supervisory challenge. This situation has negatively affected the profitability of banks. This tendency has threatened both the viability and sustainability of the commercial banks and in addition, ruins the accomplishment of the objective for which they were expected which is intermediation and allocation funds in an efficient way from the surplus to the deficit units. It is imperative to investigate if macro-economic factors have any bearing on these NPLs increase in the financial sector in Kenya.

Several studies have been done on macro-economic factors and how they affect the default rates of financial institutions. In the global front, Alfred et al. (2011) modelled unexpected credit losses and empirically evaluated the connection between the losses, including nominal interest rates, inflation, GDP growth and the difference in market share, with a number of Macroeconomic variables. The study did not include foreign exchange fluctuations as one of the macro-economic

variables thus presenting a conceptual gap. Hogarth, Sorensen & Zicchino (2005) examined how macroeconomic factors affected the loan written off in the banking sector in UK where they used the VAR system. The variables included in the model were nominal interest rates, output gap and annual rate of inflation. The study did not include economic growth and foreign exchange fluctuations as part of the macro-economic variables thus presenting a conceptual gap. Patra and Padhi (2016), for different group of Indian commercial banks, examined the bank's specific and macroeconomic factors in non-performing assets. Both the bank specific and macro-economic determinants of NPLs were examined in the study thus revealing a conceptual gap. A contextual gap exists since these studies were undertaken outside the context of Kenya.

Locally, Warue (2013) examined how both banks specific and macroeconomic factors affects the NPLs of the commercial banks in Kenya. The model developed in this study entailed creation of two macroeconomic credit risk models that each consisted of a multiple regression and a number of auto regression models that considered the retroactive impact of default rate on bank loans. Both the bank specific and macro-economic determinants of NPLs were examined in the study, thus presenting a conceptual gap. A survey by Awuor (2015) assessed the effects of firm specific variables on NPLs in Kenya and found a positive association amongst operational cost efficiency, liquidity, and earnings potential to NPLs levels. The study examined bank specific determinants of NPLs, thus presenting a conceptual gap. The GDP growth rate, high rate of unemployment, high rate of real interest rate, and loan losses reserve ratio significantly increased non-performing loans as concluded by Onchomba (2014) who assessed the link between macro-economic factors and Kenyan mortgage firms' NPLs. The study did not focus on inflation and its effect on NPL thus resulting in a conceptual gap. The study was also conducted in the mortgage institutions context and not the commercial banks context, thus presenting a contextual gap.

The concept of inflation rate and NPLs may not be novel as evidenced by the numerous studies that have been conducted. However, available literature is not sufficient to provide a framework for determining the impact on commercial banks' NPLs of macro-economic factors. The studies reviewed that related macro-economic factors and NPLs did not include all the macro-economic factors to be included in the study, which entailed, economic growth, prevailing lending interest rates, inflation, and foreign exchange fluctuations. The study by Awuor (2015) assessed the effects of firm specific variables on NPLs. A conceptual gap is presented in these studies. The global studies reviewed were not carried out in the Kenya resulting in a contextual gap. The study by Onchomba (2014) assessed the association between macro-economic factors and Kenyan mortgage firms' NPLs. The study was also conducted in the mortgage institutions context and not the commercial banks context, thus presenting a contextual gap. Thus, this research paper sought to identify and fill such conceptual and contextual knowledge gaps through establishing the impacts of inflation on the default rate of Kenya commercial banks. It also aims to add a wide variety of information on non-performing loans to the current local research base in this area. The research question intended to be addressed in the study; "What is the effect of inflation on loan default rate of commercial banks in Kenya?

1.3. Research Objectives

The objective of the study will be to investigate the effect of inflation on loans default rate for commercial banks in Kenya.

1.4. Value of the study

This study provides officials and policymakers with a basis for controlling regulating strategies to alleviate economic crises in the financial system as well as to recommend and account for credit

risks arising from the quality of loans. Commercial bank regulators, the CBK, the government, and policymakers would acquire vital information on the effects of macroeconomic factors on loan repayment in the banking industry. The government could utilize the study to help them make financial regulation policy. In their existing regulatory framework, policymakers would also learn how challenges and loopholes influence the banking sector operations. The investigation will go about as an insight on whether changes in the various macro-economic factors impact on loan defaults significantly. The CBK, primarily the Monetary Policy Committee (MPC), is responsible for establishing appropriate policies relating to macroeconomic factors and how to maximize loan repayment, particularly throughout economic cycles, such as booms and busts.

Policy decisions will also be informed as far as investments are concerned. Investment is a function of savings, consumption and disposable income. With outbreak of a pandemic the disposable income for households is greatly affected. The response of decreased disposable income would most likely be on reduced savings, as well as reduced consumption patterns. Policy makers would find the study valuable as it would inform on critical areas to prioritize on making policies to enhance economic stimuli during a pandemic, or other world externalities.

Future researchers and academicians will also find this study to be important as it will guide them in undertaking their literature review. It will provide a basis for establishing their research gap and help them in either supporting or critiquing findings of their studies. This study will provide guidance on effect of inflation on NPLs in commercial banks in Kenya that it will open-up research topics which can be undertaken by future researchers to provide information regarding these variables in Kenya. The study will also provide necessary literature that either supports or critique existing theories on inflation and NPL.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter captures the theoretical review that explains the theories related to the study. It also contains other factors that affect economic growth. The chapter then discusses empirical literature where local and international studies are assessed. Conceptual framework is then discussed and drawn and a summary of literature review concludes the chapter.

2.2 Theoretical Review

In this section, theories that are pertinent to the research are explained where the originator of the theory is identified, the key propositions of the theory are thereby explained as well as the criticism for each theory. The relevance of the theory is then discussed as the expected relationship between the variables is spelt out as predicted by the theory. The monetary theory of inflation, the real theory of interest as well as protection motivation theory will be discussed in this study.

2.2.1 The Monetary Theory of Inflation

The monetary theory of inflation is a foundational theory of economics that claims that money supply growth is the source of inflation, and that the quicker money supply expands in an economy, the faster inflation rises. According to the theory, the price level is determined by the money supply, the velocity of the money supply, and the amount of income (Ali & Bilquees, 1996). Inflation is caused by an increase in the money supply, according to the monetary theory of inflation. Inflation rises quicker when the money supply grows faster. A 1% increase in the money

supply leads to a 1% increase in inflation. The price level is proportional to the money supply while all other factors remain constant.

The relevance of the theory to the study is related by the fact that increasing money supply and therefore increasing inflation would mean that borrowers will pay for their old loans at a "cheaper" price since it the value of interest rates they pay would only buy less basket of goods and services. The increase in inflation is thereby expected to reduce loan default rate, more so for fixed interest loans. The reason is because the loans would become cheaper with increase in inflation. The theory therefore tries to provide an inverse relationship between the study variables.

2.2.2 The Real Theory of Interest

This particular was first introduced by Irving Fisher and argues that the real economic variables consequently dictate the real interest rate. Changes in inflation rate would therefore have an impact on the real interest rate that mean that the cost of borrowing would increase or decrease and therefore affect loan repayments.

2.2.3 Protection Motivation Theory

As regards to this theory it was posited by Rogers (1975) on the most proficient method to understand and adapt to worry of hazards appeals. The theory depended on researches that had been conducted in the past by Lazarus (1960) who researched on the most proficient method to adapt and persevere in stressful circumstances. Rogers (1983) enhanced his suggestions to make it an overall theory that zeroed in on viable influential communication. This theory expresses that an individual ensures themselves dependent on four variables: perceived likelihood of

actualization of an event, the apparent seriousness of an dangerous event, the viability of the suggested preventive measures, and also the apparent self-adequacy.

The differing and opposing analysis of this theory proposes that PMT theory overemphasizes on cognitive capacities. They likewise propose that the theory needs explanation of enthusiastic response to fear requests on behaviour and stance. The theory likewise doesn't obviously show the single differentiation or the single impact on taking care of adapting perspectives and fear promptings (Tanner et al., 1991). This theory is relevant to this research as it attempts to legitimize the manner in which people react in circumstances of conceivable misfortune. The theory depicts how managers confronted with hazardous macroeconomic variables, respond by evaluating the probability at the macroeconomic risk source, conceived seriousness of event of the loss just as the adequacy of the suggested preventive measures.

2.3 Determinants of Loan Default Rate

Loan default rate may be determined by several factors which either enhance or may avert non-performing loans. There are therefore various determinants of LDR that influences LDR positively or negatively, these include inflation, lending interest rates, economic growth, and exchange rate fluctuations.

2.3.1 Inflation

Inflationary pressures have been explained by Riley (2011) as the factors that bring about demand as well as supply-side pressures that end up in the rise in the general price level. The cost-push inflationary pressure results when cost-related items such as increase in wages, increase in import prices as well as increase in the cost of raw materials or fuel among other components used in

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production, result in increase in general prices. Demand-pull inflationary pressure is at its maximum when actual GDP exceeds potential GDP causing a positive output gap. On the other hand, cost push inflationary pressure would arise when wages increase, that would increase import prices that would lead to an increase in the prices of raw materials. The increase in general price level would on the other hand increase the real disposable income as consumers fail to afford a basket of goods that was affordable before the inflationary pressure. With a reduction in consumption, production decreases and therefore a decrease in economic growth would be envisioned (Riley, 2011).

Mishkin and Adam (1997) posits that inflation means that the lenders that are paid a fixed interest rates on loans loses purchase power from earned interest since it is lower as a result of inflation whereas the borrower gains purchasing power. Inflation has a positive effect whereby the borrowers with loans having fixed nominal interest rates will have a debt relief as the real interest rate will reduce as the inflation rate increase. However, banks usually deal with the risk of inflation by either incorporating the inflation premium in the interest rates through creation of a higher specified interest rate or through issuing variable interest rates.

2.3.2 Bank's Lending Interest Rates

Keynes (1936) denotes to interest rates as the cost incurred to borrow capital for defined time-period. Interest rates are normally used to refer to the credit cost in a country. It is the cost of existing resource claims in relation to potential resource consumption. The lending rate is the money paid back by the loanee to the lender as compensation for using money that does not belong to him or her for a certain period of time (Kwak, 2000). The element of the magnitude and how fast the reaction of bank loaning rates to changes in policy-controlled financing costs addresses a

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significant component of the transmission system of monetary policy. Bank loaning rates are critical, if not the best, determinant of the marginal cost of short-term external financing in an economy. In addition, they can likewise give valuable data about advancements in the average expense of acquiring a loan, to a certain extent that relies upon an intermediary's dependence on short-term or adjustable-rate financing at those rates. Such opportunity cost and effects of cash-flow impacts are two of the fundamental channels through which monetary policy driving forces are relayed to the rest of the economy. This discloses concerns identified with the extending of loaning spreads in those nations encountering broad balance sheet restructuring in the monetary and non-monetary sectors during downturn periods, particularly in some Anglo-Saxon and Nordic nations, as well as in Japan. It is additionally essential for the justification behind the transient troubles in shielding external parities notwithstanding fast changes of loaning rates to policy-controlled rates uncovered by the ERM emergency during Autumn in 1992 (Mutana et al., 2018).

The borrower's capacity to repay a loan is impaired by increase in the cost of credit. A rise in interest rates without a corresponding rise in a borrower's disposable income raises the borrower's default risk. In contrast to a period with lower interest rates, a period with higher interest rates would have a comparatively higher default rate. In times of lower interest rates, the borrowers net returns improve which translate to ability of the borrower to perform hence reduce default rates (Memmel et al., 2012).

2.3.3 Economic Growth

Economic growth denotes the rise in the productivity of a country, comparing the productivity of one period against another period. Real term or nominal terms can be used in measuring it. Conventionally, Gross Domestic Product (GDP) or Gross National Product (GNP) are used in

measuring the aggregate economic growth however other ways of measuring it are applied (Liu & Ryan, 1995). The phase of the economic growth cycle has a notable effect on credit risk. In times of financial crisis and recession, the default risk is normally higher and in the contrast the default risk is lowers in times of boom (Liu & Ryan, 1995). Quagliariello (2007) established that Non-Performing Loans (NPLs), loan-loss provisions, and Return on Assets (ROA) follow economic growth cycles. Liu and Ryan (1995) theorized that the ratio of NPLs to the outstanding loan book values might periodically vary considerably for business loans due to economic conditions.

Credit providers observe macro and micro economic factors relevant to an industry type, in order for them in assessing a credit seekers application. Thus, the lenders have an added strength of analyzing a borrower's sound prospective cash flows with reference to employment opportunities, industry growth, and demand for a category of a security. Macroeconomic factors have a major effect on the default rate. The primary indicator of macroeconomic factors is the GDP growth (Rajan & Dhal, 2003).

2.3.4 Exchange Rate Fluctuations

As stated by Williamson (1985) exchange rate volatility is a measure of the movements of fundamentals of economic situations such as inflation rates, interest rates, and balance of trade positions that cause unexpected movements in the exchange rate. It therefore entails the unexpected movement in the percentage changes in the exchange rate. Exchange rate volatility has largely been attributed to increase uncertainty in profits. It has also been associated with restriction in the movement of capital internationally by reducing both direct investment in financial portfolio investment and foreign operating facilities. Fixed exchange rate system is meant to remain unchanged for a long period of time and it therefore has low volatility. However, governments

through their respective central banks were required to adopt a floating exchange rate which is controlled by the demand and the supply of foreign currency. The floating exchange rate therefore changes from time to time and it becomes very cumbersome to accurately predict the exchange rate in a future period (Ayse, 2015).

The floating exchange rate is very sensitive to changes in macroeconomic policies. These changes that respond to changes in macroeconomic policies may however be as much predictable as the change in these policies. Economic shocks are unpredictable and therefore they influence the exchange rate system by increasing volatility. The floating exchange rate system when affected by economic shocks or unexpected movements in economic factors, lead to unexpected shifts and movements in exchange rate fluctuations. These unexpected changes are costly to both international and local investors as it intensifies domestic impact of disturbances that arises from foreign markets which exacerbates fluctuations in domestic growth and unemployment. Unexpected changes in exchange rate increases volatility in exchange rate which may be difficult to predict by the use of economic models. Increased exchange rate volatility increased risk and therefore increases the chance of increasing Loan's Default Rate (International Monetary Fund, 2019).

2.4 Empirical Studies

There are quite a good number of studies that have been done on determinants of the default rates of financial institutions. In the global front, Yam (2016) investigated on the association of bank specific factors and macroeconomics factors, NPLS, sustainability and performance of commercial banks in Indonesia. The period of study was 10 years ranging year 2004-2013.the study examined the effects of unemployment, interest rate, inflation, exchange rates and GDP. Liquidity and credit

growth, capital strength and total assets were the bank specific variables that were employed. The study findings revealed that both bank specific and macroeconomic factors significantly impacted on the sustainability of bank performance and the level of NPLs. The study focused on both the bank specific and macro-economic determinants of NPLs, thus presenting a conceptual gap.

Škarica (2014) investigated the determinant of variation in the NPLs ratio in several European developing markets through a panel data methodology for seven Countries in Central and Eastern Europe from the year 2007 to 2012. The study considered the countries entailing, Romania, Bulgaria, Czech Republic, Latvia, Croatia, Slovakia, and Hungary. The study findings established that the main reason of the high NPLs level was the slow-down of an economy, which is demonstrable through large coefficients of GDP, inflation, and unemployment rate. Despite the fact the study was focused on macro-economic variables the effect of inflation on NPLs ratio was not clearly ascertained. The study also was not undertaken in the Kenyan context, which therefore leaves a contextual gap.

Mesai and Jouini (2013) explored the determinants of NPLs in three European countries, which entailed Italy, Greece, and Spain. The study period ranged year 2004- 2008 and sample a total number of 85 banks. The study considered the following macroeconomic factors; the GDP growth rate, the lending interest rates, and the unemployment rate. The study used a panel data methodology. The study findings established that that NPLS differ inversely with the GDP growth rate, the banks' profitability, and assets, and directly with the unemployment rate, the loan loss reserves, and lending rates. The study did not include lending interest rate and exchange rate fluctuations as part of the macro-economic variables thus presenting a conceptual gap. The study also was not undertaken in the Kenyan context, which therefore presents a contextual gap.

Regionally, Ofori-Abebrese, Pickson, and Opare (2016) evaluated the influence of macroeconomic factors on the loan performance of banks in Ghana. The data was collected for years ranging 2008-2015.The study employed ARDL bounds estimation model to assess co-integration and from the findings, it was revealed that the study variables had a long-term relationship. The conclusion of the study was that government treasury bills and inflation are the macroeconomic factors, which influences loan performance. The study did not include economic growth, lending interest rate and exchange rate fluctuations as part of the macroeconomic variables thus presenting a conceptual gap. The study also was not undertaken in the Kenyan context, which therefore presents a contextual gap.

Sheefeni (2015) assessed the bank specific determinants of NPLs in Namibian commercial banks. The study applied the unit root test, time series modelling, co-integration tests, impulse response functions, and error decomposition models for the period of between 2001 and 2014. The study findings revealed that the ROA and ROE, loan average assets ratio, and log of total assets are the key determinants of NPLs. The study assessed bank specific determinants of the default rate and not macroeconomic determinants thus presenting a conceptual gap. Rocco and Plakhotnik (2009) opine that a conceptual framework establishes the basis for research questions and objectives of a study through anchoring the study in the appropriate knowledge constructs.

Chege and Bichanga (2016) investigated the impact of NPLs on the financial performance of Kenyan commercial banks. A descriptive survey design was used in the study, as well as a census of the 44 commercial banks. Between 2011 and 2015, secondary data was collected during a 5-year period. The outcomes of the study demonstrated that NPLs had a statistically significant influence on financial performance using multiple linear regression. Other bank-specific characteristics such as bank size, ownership, and operational expenses had a quantitatively effect

on financial performance, according to the study, but liquidity had no effect on financial performance. The survey did not link economy issues to banking industry default rates, resulting in a methodological gap.

Agade (2014) investigated how demographic conditions affect the banking sector's production performance in Kenya. The study was carried out using a descriptive research approach using secondary data. to examine the information, multiple linear regression model was utilized and found out that the main factors that affected the Kenya banking sector Operational efficiency included; lending rates, GDP, variation in exchange rates and inflation. The conclusion of the study was that there a significant and negative association amongst inflation and banking sector operational efficiency. The study related the macroeconomic factors to operational efficiency of commercial banks and not the default rate thus presenting a conceptual gap.

Murungi (2014) surveyed the impact of macroeconomic factors on the insurance agencies in Kenya monetary execution. The populace considered was 46 protection firms in Kenya and a clear connection research configuration was utilized. Auxiliary information, which was gathered for a considerable length of time going 2009-2013, was utilized. The review discoveries set up that the loaning loan cost, GDP, claims, and cost proportion were essentially identified with monetary execution, however the expansion rate, cash rates vacillations, cash supply, and firm size were measurably unimportant. The review set up that loan cost, monetary development, claims proportion, and cost proportion were the major macroeconomic determinants of protection firms' monetary exhibition. The review related the macroeconomic variables to monetary execution of business banks and not the default rate consequently introducing a theoretical gap.

Gitonga (2014) examined the what macroeconomic variables mean for credit hazard of business banks in Kenya banking industry from 1990 to 2013 utilizing yearly optional information. The review utilized an OLS numerous straight relapse model while applying a blunder revision model on the model. The review discoveries uncovered that conversion scale changes had a huge however adverse consequence on default hazard. Homegrown credit to the private area by the business banks and expansion additionally eminently affected credit hazard, however loan costs had a positive and critical impact on layaway hazard. The review did exclude monetary development as one of the large scale financial factors in this manner introducing a reasonable gap.

Warue (2013) made an assessment of the impact of both macroeconomic and bank specific factors on the Kenya commercial banks NPLs. The study employed secondary data and a census of all the 44 Kenyan commercial banks was conducted for the period between 1995 and 2009. The study findings revealed that per capita income had an inverse and significant effect on NPLs across various bank categories in terms of size while income per capita had a significant negative relationship with NPL levels across categories of bank ownership. The study concluded that bank-specific factors influence Kenyan commercial banks' NPLs at higher degree relative to macroeconomic factors. The study assessed bank specific determinants of the default rate and not macroeconomic determinants thus presenting a conceptual gap.

2.5 Conceptual Framework

Conceptual framework refers to the relationship as well as the interactions of study concepts which are represented in a diagrammatic format. This helps in clear understanding of the relationship that exists between the study variables as indicated in the figure 2.1.

Figure 2. 1: Conceptual Framework
      INDEPENDENT VARIABLES

```
┌─────────────────────────────┐
│        INFLATION            │
│                             │                              DEPENDENT VARIABLE
│    ● Inflation Rate         │──────┐
└─────────────────────────────┘       \          ┌──────────────────────────────────┐
                                       \          │        LOAN DEFAULT RATE         │
┌─────────────────────────────┐         \         │                                  │
│       Lending Rate          │          \        │   ● (Non-Performing      Loans/  │
│                             │───────────\───────│                                  │
│    ● Bank's Lending Rate    │            \      │     Outstanding Loans and Advances)│
└─────────────────────────────┘             \     │                                  │
                                             /     └──────────────────────────────────┘
┌─────────────────────────────┐             /
│      ECONOMIC GROWTH        │            /
│                             │───────────/
│    ● Change in GDP          │          /
└─────────────────────────────┘         /
                                       /
┌─────────────────────────────┐       /
│  Exchange Rate Fluctuations │      /
│                             │─────/
│    ● Change of Kes/$        │
└─────────────────────────────┘
```
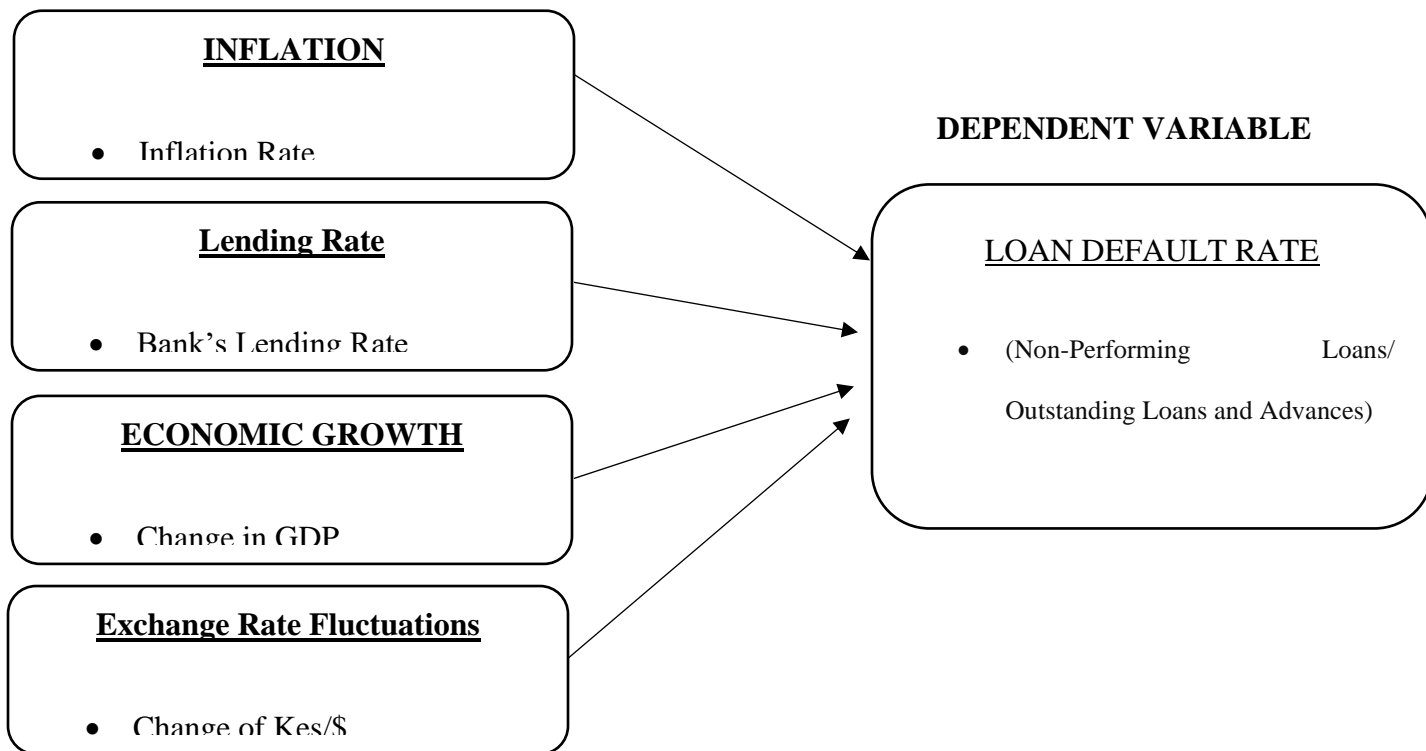
SOURCE: Author, (2021)

The conceptual framework indicates that the independent variables are inflation measured by inflation rate, Interest rates that will be determined by banks' lending rate, economic growth determined by the rate of change of GDP and exchange rate fluctuations which is the increase or decrease in the exchange rate between KSH, and USD.

2.6 Summary of Literature Review

As shown in the empirical literature reviewed above, there exist several knowledge gaps. The studies reviewed did not include all the macroeconomic factors to be included in the current study which entail; lending interest rate, economic growth, inflation and exchange rate fluctuations thus presenting a conceptual gap. Some studies examined both the bank specific and macro-economic determinants of NPLs, thus presenting a conceptual gap. Additionally, some studies did

not relate macroeconomic factors to the default rate, consequently leaving a conceptual gap. The foreign studies reviewed were undertaken outside the context of Kenya hence, there exist a contextual gap.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The methodology that was adopted in this study was depicted in this chapter as it involved the description of the research design, data collection as well as data analysis.

3.2 Research Design

The design adopted a descriptive research design of how inflation affect loan default rate in commercial banks in Kenya. The study investigated detailed data from World Bank as well as from Kenya National Bureau Services (KNBS), and reports from Central Bank of Kenya. According to Creswell (2008) descriptive research design gathers data that helps to explain an existing condition or explain the factors that influence the condition. It is used to describe some features for study population to make inferences from cause and effect. A descriptive research design is able to explain the study variables and be in position to describe the relationship that exists between the study variables.

3.3 Data Collection

Quantitative and secondary data collection method was employed in the study. This means that the study relied on published data that was accessed in the World Bank's website, CBK's Supervisory Reports as well as in the KNBS website in collecting quarterly data in regard to NPLs, Inflation rate, economic growth, interest rates, and exchange rate fluctuations. Quarterly data for the last 20 years was therefore collected, which means that the study period was 2001-2020.

3.4 Data Analysis

Data collected was checked for completeness and consistency. Data cleaning was then undertaken to ensure that only relevant and valid data was used in the study analysis. SPSS version 23 was employed in undertaking data analysis. Diagnostic tests were undertaken, before the analytical model was used to undertake the analysis.

3.4.1 Diagnostic Tests

The study undertook diagnostic tests that assessed whether data complied with assumptions of the analysis being undertaken. This study used ordinary least square as the tool of analysis and therefore necessary diagnostic tests were undertaken as a way of assessing whether data was suitable and complied with the assumptions made by regression analysis.

3.4.1.1 Linearity Test

Regression analysis assumes that data can be turned into a linear format. It therefore suggests that linear qualities may be used to determine or predict variables in the analytical model. Linearity test is undertaken by undertaking graph plots. In this case the plot would indicate whether data forms linear tendencies or not. If data does not form linear tendencies, then it fails linearity test and there would be need to transform the data in order to ensure that it forms linear tendencies before regression analysis is undertaken.

3.4.1.2 Normality Test

Normality test indicates whether data forms a bell-shaped distribution format which is called a normal curve. When data is large enough, it tends to take the shape of a normal curve and therefore the data may be used to undertake statistical assumptions. Normality test is undertaken by the use

of Shapiro Wilk test. The null hypothesis states that the population from which the data is obtained is normally distributed. The null hypothesis is rejected if the significance (p-value) is below 0.05. Transformation of data is preferred when the null hypothesis is rejected.

3.4.1.3 Multi-collinearity Test

This is a test that shows whether the independent variable remain independent or they influence each other. Regression analysis assumes that independent variables remain independent and therefore do not influence each other. Multi collinearity test is undertaken by the use of Variation inflation Factors (VIF) or tolerance levels to determine whether there exists multi-collinearity between variables or not. There exists a multi-collinearity when the VIF values are above 10. In this case the variable with multicollinearity is dropped from the model.

3.4.1.4 Autocorrelations Test

The test of autocorrelations is the degree of correlation of the same variable between two successive time intervals. It therefore indicates the lagging of the variable after successive time interval and how the new version of the variable is related to the original version. The most common method that is undertaken in the measure of auto correlation is the Durbin-Watson test. The test produces test scores that ranges from 0 to 4. A value that is close to 2 indicates that there is less autocorrelation while values closer to either 0 or 4 indicates that there is either positive or negative autocorrelation respectively (Creswell, 2008).

3.4.1.5 Stationary Tests

Stationary test is undertaken for time series data that tries to determine whether a time series was produced by a stationary process. This is important in any time series data and it can be undertaken by plotting the data and determining by the use of visual effect on whether the data is as a result of a stationary process or not. There are also statistical tests that are undertaken to help find out specific type of stationarity. This study will employ Unit root tests and specifically the Dickey-Fuller test where a test of a unit root will be undertaken (Zivot & Andrews, 1992).

3.4.1.6 Test on Model Specification

Specification tests are undertaken to verify of one specification at a time. It is therefore used to determine whether the model is valid to test the scenario or it's not applicable. This study will employ the use of Cox-Pesaran-Deaton or simply put as CPD test, that allows one to determine the truth whether there exists a non-linear and a multivariate regression model. In the circumstance that there is a non-nested alternative hypothesis, the latter should not be true and need not be a hypothesis to be tested. A modern model strategy will therefore be deployed to determine whether the model is supported by any form of economic theory. The use of F test will be undertaken where R squared will be used to rank different models, and arrive at a model with the highest coefficient of determination (Zivot & Andrews, 1992).

3.4.1.7 Optimal Lag Test

There is a test of determining the optimal length that should be considered in a time series. This is contingent on the number of observations where AIC and Final Prediction Error (FPE) are appropriate when observations are less than 60. However, the Hannan-Quin is

more efficient when there are over 120 observations. This study will employ the AIC model to determine the optimal lag-period selection. However, a modified AIC model referred as MAIC may be preferred (Serena & Perron, 2001).

3.4.2 Analytical Model

Data will be analyzed by use of ordinary least squares method that will be regressed to determine the relationship between the variables.

The multiple regression model will take the form;

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

Where;

α_o and ε are regression constants

Y represents Loan Default Rate (NPL Ratio of Total Non-Performing Loans/Total Loans Issued)

X_1 represents Inflation rate

X_2 represents Bank's lending Interest Rates

X_3 represents Economic Growth- Change in GDP

X_4 represents exchange rate fluctuations (Ksh to USD)

$\beta_1, \beta_2, \beta_3,$ and β_4 are the coefficients of $X_1, X_2, X_3,$ and X_4 respectively

3.4.3 Significance Test

The study employed F distribution statistic where a test of ANOVA was undertaken in order to determine the significance of the effect of inflation on loans default rate in commercial

banks in Kenya. The significance test was carried out at 5% where if the p-value falls below 0.05 then the null hypothesis is rejected.

CHAPTER FOUR

DATA ANALYSIS, DISCUSSION AND PRESENTATION OF FINDINGS

4.1 Introduction

The chapter undertakes descriptive statistics of data collected for each study, it also carries out diagnostic tests for the study, correlations and regression analysis. The chapter is then concluded by undertaking an interpretation of study findings.

4.2 Descriptive Statistics

Descriptive statistics is undertaken in order to express the study variables and identify the caliber of data collected for each variable in form of the mean of the data, the maximum as well as the minimum value, and the standard deviation from the mean for each variable.

Table 4. 1: Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Loan Default Rate	80	3.40%	39.40%	13.5926%	11.73640%
Lending Interest Rate	80	11.84%	20.21%	15.1065%	2.47382%
Economic Growth	80	-5.70%	11.60%	4.6762%	2.71877%
Inflation Rate	80	1.96%	29.30%	8.6932%	5.68625%
Exchange Rate Fluctuations	80	-8.72%	13.18%	0.4640%	3.36798%
Valid N (listwise)	80				

Source: Author (2021)

The dependent variable for the study is the loan default rate that measures the percentage of total non-performing loans divided by the total gross loans for the banking sector in Kenya. The mean loan default rate was 13.6% with a high standard deviation of 11.74% which indicates that the loan

default rates across the different periods was significant different. The maximum loan default rate was 39.6% while the minimum loan default rate was 3.4%.

The independent variables seek\ to influence and impact the dependent variable either positively or negatively. The lending interest rate represents the average interest rates with which commercial banks advance loans to clients in the study period. The mean lending interest rate was 15.1% with a low standard deviation of 2.47%. The maximum interest rates with which commercial banks charged their clients within the study period was 20.21% while the minimum was 11.84%.

Economic growth on the other hand represents the rate of change of total GDP generated within the borders of the country for each specific period. The average economic growth was 4.67% with a standard deviation of 2.72%. The maximum and the minimum economic growth experienced within the study period was 11.6% and -5.7% respectively.

Inflation rate on the other hand represents the percentage change with which the CPI index changes from one period to another. It represents the percentage change with which a basket of goods increases or decreases in price. The average was 8.69% with a high standard deviation of 5.69%. The minimum value was 1.96% while the maximum was 29.3%.

Exchange rate fluctuations on the other hand represents the changes in spot rate exchange rate of the Ksh against the dollar. The fluctuations represent the increase and the decrease in the exchange rate, where the mean was 0.46% while the standard deviation was 3.37%. The maximum was 13.18% with a minimum of -8.72%.

4.3 Diagnostic Tests

The use of ordinary least squares requires that certain assumptions made by use of OLS regression method is complied with. The testing of whether these assumptions are complied with is identified as diagnostic tests. The tests undertaken by the study were linearity test, normality test, homoscedasticity test, test for autocorrelations, multicollinearity test, stationarity test, and optimal lag test.

4.3.1 Linearity Test

Regression analysis assumes that data can be turned into a linear format. It therefore suggests that linear qualities may be used to determine or predict variables in the analytical model. Linearity test is undertaken by undertaking graph plots. In this case the plot would indicate whether data forms linear tendencies or not. Normal P-P plot may also be undertaken where linearity is assumed if the plots follow the diagonal line.

Figure 4. 1: Normal P-P Plot
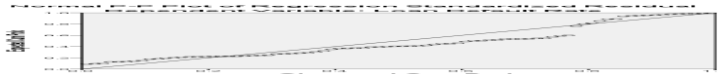
Figure 4.1 indicates that the plots follow the diagonal line and therefore linearity of data is assumed.

4.3.2 Normality Test

Normality test indicates whether data forms a bell-shaped distribution format which is called a normal curve. When data is large enough, it tends to take the shape of a normal curve and therefore the data may be used to undertake statistical assumptions. Normality test is undertaken by the use

of Shapiro Wilk test. The null hypothesis states that the population from which the data is obtained is normally distributed. The null hypothesis is rejected if the significance (p-value) is below 0.05. Transformation of data is preferred when the null hypothesis is rejected.

Table 4. 2: Shapiro Wilk Test

Variable	Obs	W	V	z	Prob>z
Lending Rate	80	0.90001	6.863	4.220	0.00001
Economic Growth	80	0.89193	7.418	4.391	0.00001
Inflation Rate	80	0.79880	13.810	5.753	0.00000
Exchange Rate	80	0.93315	4.589	3.338	0.00042

Source: Author, (2021)

Table 4.2 indicates that all the independent variables have p-values less than 0.05 and therefore there is no normality in the distribution of the data. The study would therefore treat the data by undertaking standardized independent variables whenever undertaking parametric test such as regression analysis. Otherwise, the study would prefer the use of non-parametric test which do not require data to be normally distributed.

4.3.3 Homoscedasticity Test

In undertaking regression analysis there is sometimes a problem of heteroscedasticity where there is a systematic change in the variance of residuals over a range of measured values. This is tested by use of Breusch-Pagan Test where a Chi-Square test statistic is

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obtained as well as a corresponding p-value. If the p value is greater than 0.05 then there is sufficient evidence to say that there is no heteroscedasticity present.

Table 4. 3: Breusch-Pagan Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of Loan Default Rate
$\text{chi}^2(1)$ = 4.20
$\text{Prob} > \text{chi}^2$ = 0.0403

Source: Author, (2021)

Table 4.3 indicates that the p-value is less than 0.05 that indicates that there is a problem of heteroscedasticity in the data. The problem is also corrected by treating the data variables through standardization as well as use of non-parametric test instead of use of parametric tests.

Figure 4. 2: Scatterplot

Scatterplot
Dependent Variable: Loan Default Rate
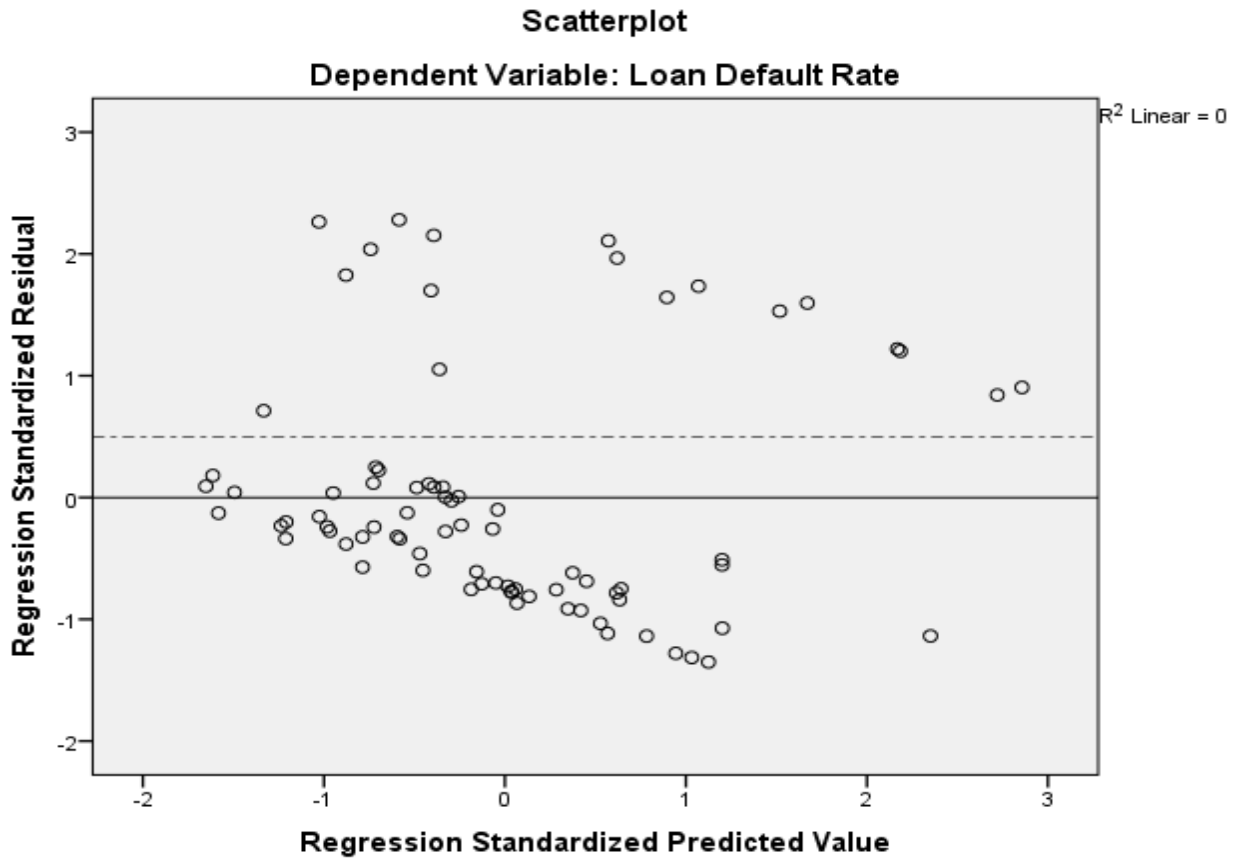
The scatterplot on figure 4.2 indicates that there is a bias in the distribution of the plots between the positive and negative side as more plots are in the negative side. This indicates that there is presence of heteroscedasticity.

4.3.4 Multi-collinearity Test

This is a test that shows whether the independent variable remain independent or they influence each other. Regression analysis assumes that independent variables remain independent and therefore do not influence each other. Multi collinearity test is undertaken by the use of Variation inflation Factors (VIF) or tolerance levels to determine whether there exists multi-

collinearity between variables or not. There exists a multi-collinearity when the VIF values are above 10. In this case the variable with multicollinearity is dropped from the model.

Table 4.4: Multi-Collinearity Test

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
Lending Interest Rate	.947	1.056
1 Economic Growth	.984	1.016
Inflation Rate	.927	1.079
Exchange Rate Fluctuations	.948	1.055

a. Dependent Variable: Loan Default Rate

Source: Author, (2021)

Table 4.4 indicates that all variables have VIF of less than 10 and therefore no multi-collinearity.

4.3.5 Tests for Autocorrelation

The "result on the autocorrelation test carried out using the Durbin-Watson Statistic is presented on Table" 4.5.

Table 4. 5: Autocorrelation Test

Model Summary^b

Model	Durbin-Watson
1	.120

a. Predictors: (Constant), Exchange Rate Fluctuations, Economic Growth, Lending Interest Rate, Inflation Rate

b. Dependent Variable: Loan Default Rate

The "Durbin-Watson statistic is measured from point 0 and point 4. If there exist no relationship between the factors, a measurement of 2 is derived. In the derivation that the value fall under point 0 to a certain degree under 2, this means that a positive autocorrelation and on the contrast a negative autocorrelation exist if the value falls under po

int more than 2 up to 4. As a typical principle in measurements, values falling under the reach 1.5 to 2.5 are deduced as generally ordinary though values that drop out of this interval raise a oncern. Field (2009) be that as it may, thinks those qualities over 3 and under 1 are a certain justification for concern. Consequently, the data utilized in this panel is serially auto correlated since it doesn't meet this limit having a Durbin-Watson Statistic" of 0.12. Transformation of variables was therefore undertaken by standardizing the study variables as a remedy for autocorrelation.

4.3.6 Stationarity Test

Stationarity test was done by the use of Augmented Dickey Fuller test. Stationarity test is done on time series data to indicate whether data is either stationary or non-stationary. Data is stationary if the increase or decrease in the variable is not affected or does not result from the cyclic increase or decrease in data but through a real increase or a decrease in the variable. One of the methods in which stationarity in data is tested is by comparing the R squared with the Durbin Watson Statistic. Data that depicts presence of stationarity has DW statistic being greater than R squared value. Table 4.5 indicates that DW statistic is 0.12 while R squared is 0.186 that indicates that data is non-stationary.

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4.3.7 Model Specification Test

In order to undertake a model specification test, the study used Akaike Information Criteria (AIC) where an objective manner of determining model fits is determined. It is a trade-off between number of parameters added to the model and the incremental number of errors. The model with the better fit has lower AIC values.

Akaike's information criterion and Bayesian information criterion (BIC)

```
-----------------------------------------------------------------------------

    Model |  Obs    ll (null)   ll (model)   df       AIC        BIC

      1 |   80   58.38608   66.59976    5    -123.1995  -111.2894

      2 |   80   58.38608   66.59501    4    -125.19   -115.6619

-----------------------------------------------------------------------------

        Note:  N=Obs used in calculating BIC; see [R] BIC note
```

The AIC and the BIC model indicates that dropping exchange rate fluctuations variable from the model, the values of AIC and BIC becomes lower and therefore a better model. The study therefore advocated for the drop of the exchange rate fluctuations from the model.

4.4 Correlation Analysis

The correlation analysis may be defined as a statistical method that used to identify whether there exists relationship between two variables and the strength of that relationship in case it exists. It is used to identify whether there is significant connections or patterns between the variables. Pearson correlation is used in undertaking correlation analysis. However, it is a

parametric test and as such a non-parametric test should be undertaken and therefore the study prefers Spearman's correlation.

The independent variables are correlated against the dependent variable to identify the pattern and the relationship between the variables. A correlation of 1 indicates perfect correlation while zero means no correlation, any value close to zero means that the correlation is weak while values close to one indicate strong correlations.

Table 4. 6: Correlations

			Loan Default Rate	Lending Interest Rate	Economic Growth Rate	Inflation Rate	Exchange Rate
Spearman's rho	Loan Default Rate	Correlation Coefficient	1.000				
		Sig. (2-tailed)	.				
	Lending Interest Rate	Correlation Coefficient	-.137	1.000			
		Sig. (2-tailed)	.225	.			
	Economic Growth	Correlation Coefficient	-.274*	-.115	1.000		
		Sig. (2-tailed)	.014	.310	.		
	Inflation Rate	Correlation Coefficient	-.295**	-.128	-.058	1.000	
		Sig. (2-tailed)	.008	.260	.611	.	
	Exchange Rate	Correlation Coefficient	-.027	-.079	.120	-.008	1.000
		Sig. (2-tailed)	.813	.485	.288	.946	.
		N	80	80	80	80	80

*. Correlation is significant at the 0.05 level (2-tailed).

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

The correlation between inflation rate and loan lending rate is significant but negative at -0.295 which implies that an increase in inflation would lead to a decrease in default rate. On the other hand, the correlation between economic growth and loan default rate is also significant and negative at -0.274 that implies that an increase in economic

growth would lead to a decrease in loan default rate. Despite the fact that the correlation between lending interest rate and loan default rate is negative, it is not significant, and it is close to zero. The same findings are obtained for correlation between exchange rate fluctuations and loan default rate.

4.5 Regression Analysis

Regression analysis is used to determine whether there exists a relationship between study variables. The multiple linear regression adopted by the study seeks to identify whether inflation rate has a significant effect on loan default rate.

4.5.1 Regression Model Summary

The summary seeks to identify whether the model is strong enough to predict a bigger percentage of changes in the dependent variable as a result of changes in the factors in the model.

Table 4. 7: Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.431[a]	.186	.142	10.86997%

a. Predictors: (Constant), Zscore: Exchange Rate Fluctuations, Zscore: Economic Growth, Zscore: Lending Interest Rate, Zscore: Inflation Rate
b. Dependent Variable: Loan Default Rate

Source: Author, (2021)

The coefficient of determination that is denoted by R squared is given by 18.6% this indicates that the model is only able to predict 18.6% of the changes in loan default rate, while the other changes in loan default rate is explained by other factors outside the model.

4.5.2 ANOVA

Analysis of variance depicts the significance of the effect of inflation on loan default rate. F test is used in analysis, where if p value is greater than 0.05 then the study fails to reject the null hypothesis, but the null hypothesis is rejected when p value is less than 0.05.

Table 4. 8: ANOVA TABLE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2019.982	4	504.996	4.274	.004[b]
	Residual	8861.719	75	118.156		
	Total	10881.701	79			

a. Dependent Variable: Loan Default Rate
b. Predictors: (Constant), Zscore: Exchange Rate Fluctuations, Zscore: Economic Growth, Zscore: Lending Interest Rate, Zscore: Inflation Rate

Source: Author, (2021)

The table 4.8 show that the p value is 0.004 which is less than 0.05 and therefore the null hypothesis is rejected. Rejecting the null hypothesis means that there is significant effect of inflation rate on loan default rate.

4.5.3 Regression Coefficients

The coefficients are useful in determining the effect of the variables if all other factors are held constant and each independent variable is increased by one unit.

Table 4. 9: Coefficients Table

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

	(Constant)	13.593	1.215		11.185	.000
	Zscore: Inflation Rate	-2.290	1.270	-.195	-1.803	.075
	Zscore: Economic Growth	-3.490	1.233	-.297	-2.831	.006
1	Zscore: Lending Interest Rate	2.360	1.257	.201	1.878	.064
	Zscore: Exchange Rate Fluctuations	-.119	1.256	-.010	-.094	.925

a. Dependent Variable: Loan Default Rate

Source: Author, (2021)

The regression model is therefore transformed into

$$Y = 13.59 - 2.29X1 - 3.49X2 + 2.36X3 - 0.119X4 + 1.215$$

The transformed regression model indicates that an increment in inflation rate by one unit while holding all other factors constant would result to a decrease in loan default rate. Increasing inflation rate has an effect of making existing loans cheaper as their interest rates is based on the old rate prior to increased inflation. The repayments are therefore cheaper with increase in inflation and therefore reducing loan default rate.

The increase in economic growth, ceteris Paribas, causes a decrease in loan default rate. This would be explained by the fact that an increase in economic growth indicates improved production of goods and services, as well as improved economic activity in the country and therefore firms are thriving and doing well hence borrowers are less likely to default on their loans.

However, an increment in lending interest rate, ceteris paribas, would result to an increase in loan default rate and this could be explained by the fact that increasing lending interest rates makes loans more expensive and therefore increasing loan default rate.

Exchange rate fluctuations on the other hand if increased by one unit they would lead to a decrease in loan default rate albeit in smaller magnitude. This means that exchange rate fluctuations favour borrowers and therefore loan default rate decreases with increase in exchange rate fluctuations.

4.6 Interpretation and Discussion of Study Findings

The main discoveries of the research indicates that inflation rate has a significant effect on loan default rate. The relationship between inflation rate and loan default rate is negative as the correlation between the two variables was negative and significant. This was explained by the fact that increasing inflation rate has an effect of making existing loans cheaper as their interest rates is based on the old rate prior to increased inflation. The repayments are therefore cheaper with increase in inflation and therefore reducing loan default rate. On the other hand, economic growth was found to have a negative correlation with loan default rate. This would be interpreted to mean that an increase in economic growth indicates improved production of goods and services, as well as improved economic activity in the country and therefore firms are thriving and doing well hence borrowers are less likely to default on their loans. Increased interest rates had a positive correlation with loan default rate meaning that increase in lending interest rates increases loan default rate as loans become more expensive with increase in interest rates and therefore increasing loan default rate. However, exchange rate fluctuations had almost zero correlation against loan default rate and therefore its effect on the dependent variable is ignored.

The study discovered a negative significant effect of inflation on loan default rate and therefore concluded that the government should be cautious with inflation policies as they would have significant effect on increasing loan default rate in the banking sector. The findings of the study were consistent with a number of studies. Yam (2016) found that both bank specific and

macroeconomic variables significantly impacted sustainability. Skarica (2014) also found that NPLS were significantly affected by economic variables. Ofori-Abebrese, Pickson & Opare (2016) found that treasury bills and inflation rate affect loan performance. Similar findings were observed by a study conducted by Agade (2014) and a study conducted by Murungi (2014).

The findings of the study are however inconsistent with findings from a number of studies that were reviewed in this study. Mesai and Jouini (2013) found that there was an inverse relationship between NPLs and lending interest rates which is contrary to the findings in this study. Chege and Bichanga (2016) found that macroeconomic factors had less effect on NPLs than bank specific factors. Gitonga (2014) found that exchange rate fluctuations have significant but negative effect on default rate. However, the research did not find any significant correlation between exchange rate fluctuations and loan default rate.

CHAPTER FIVE

SUMMARY CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter undertakes a summary of the study findings, appropriate conclusion of the study is then stipulated, after which recommendations of the study are made. The chapter also identifies the various limitations encountered while undertaking the study and identifies areas that would require further studies.

5.2 Summary

The study aimed at identifying the effect of inflation on loan default rate. Other independent variables that comprised of macroeconomic variables were identified by the study and their effects on loan default rate was also investigated. The data collected involved quarterly data for each variable for a period of twenty years, and an ordinary least squares (OLS) method was identified as the tool of analysis. Data analysis that was undertaken first involved describing main characteristics of each variable as it expressed the variable's mean and standard deviation. Diagnostic tests were also undertaken in the study to ensure that conditions required for use of OLS were complied with. However, the variables failed on a number of tests that necessitated the data to be treated through standardization. The study also preferred the use of non-parametric tests instead of use of parametric tests.

The correlation analysis undertaken by the study found that both inflation and economic growth had significant and negative correlation on loan default rate, which indicated that an increase in inflation as well as an increase in economic growth would lead to a decrease in loan default rate

as inflation would make loans relatively cheap while economic growth would ensure that borrowers are able to make good income and therefore oblige to their financial obligations. Exchange rate fluctuations and lending interest rates had positive correlation though exchange rate fluctuations had almost zero correlation against loan default rate.

According to the study's regression analysis, the model used could only explain 18.6 percent of the variations in loan default rate. Other variations in the loan default rate were therefore explained by variables not included in the model. The null hypothesis was rejected since the p value of the F test was less than 0.05, and the study showed that inflation had a substantial impact on loan default rates in Kenya's banking industry.

The findings of the study were consistent with a number of studies. Yam (2016) found that both bank specific and macroeconomic variables significantly impacted sustainability. Skarica (2014) also found that NPLS were significantly affected by economic variables. Ofori-Abebrese, Pickson & Opare (2016) found that treasury bills and inflation rate affect loan performance. Similar findings were observed by a study conducted by Agade (2014) and a study conducted by Murungi (2014). The findings of the study are however inconsistent with findings from a number of studies that were reviewed in this study. Mesai and Jouini (2013) found that there was an inverse relationship between NPLs and lending interest rates which is contrary to the findings in this study. Chege and Bichanga (2016) found that macroeconomic factors had less effect on NPLs than bank specific factors. Gitonga (2014) found that exchange rate fluctuations have significant but negative effect on default rate. However, the study did not find any significant correlation between exchange rate fluctuations and loan default rate.

5.3 Conclusion of the Study

The research thus made various conclusions in regard to the impact of inflation rate and other variables on loan default rate. The study concludes that an increase in inflation rate would result to a decrease in loan default rate. Increasing inflation rate has an effect of making existing loans cheaper as their interest rates is based on the old rate prior to increased inflation. The repayments are therefore cheaper with increase in inflation and therefore reducing loan default rate.

The increase in economic growth leads to a decrease in loan default rate. This would be explained by the fact that an increase in economic growth indicates improved production of goods and services, as well as improved economic activity in the country and therefore firms are thriving and doing well hence borrowers are less likely to default on their loans.

However, an increase in lending interest rate would result to an increase in loan default rate and this could be explained by the fact that increasing lending interest rates makes loans more expensive and therefore increasing loan default rate. Exchange rate fluctuations on the other hand would lead to a decrease in loan default rate albeit in smaller magnitude. This means that exchange rate fluctuations favour borrowers and therefore loan default rate decreases with increase in exchange rate fluctuations.

5.4 Recommendations of the Study

There are various recommendations that are made by the study based on the conclusion made by the study. The study recommends that the administration should devise strategies which will have the effect of ensuring that inflation is put under check. Despite the fact that inflation increase leads to a decrease in loan default rate, the decrease emanates from cheapening of loans advanced to

clients. It means that the reduction is only in the short run, while the devastating effect of increased inflation would have a full effect on loan default rate. This would be marked by inability of borrowers to meet their financial obligations as their disposable income would decrease significantly.

The study would also recommend that the government should undertake measures that are likely to increase and improve economic growth. These measures include policies that are able to ensure that there are appropriate working conditions and ensure that there are favorable conditions that would attract FDI into the country among ensuring that investment in by local investors is also encouraged and supported. Increased economic growth therefore boosts and improves the economy such that borrowers are in position to pay their obligations and therefore reduce loan default rate.

Lending interest rates should also be sensitively arrived at. This is because increasing interest rates, leads to loans becoming expensive such that borrowers are highly likely to default on their loan repayments. However, the government should ensure that it puts in place policies that controls increase in lending interest rates rather than pegging and controlling interest rates as the move becomes counter-productive in the long run. The forces of demand and supply should be left to determine the lending interest rates, but the government should undertake certain policy actions to ensure that the interest rates are placed under control.

The research also proposes that the government should not promote increased fluctuations in exchange rate. The exchange rate fluctuations had almost zero correlation with loan default rate as there is no direct association between exchange rate fluctuations and loan default rate, mostly when majority of the loans are issued domestically and are not denominated in foreign currency.

However, increasing exchange rate fluctuations, is likely to have counter-productive effects such as increasing risks in international trade and exposing exporters and importers to losses as a result of significant changes in exchange rate fluctuations.

5.5 Limitation of the Study

The current study was a formal study that used a deductive research strategy since it was directed by relevant literature and theories in order to further examine the theories and empirical literature results. The use of theories and past empirical literature helps to provide the framework for understanding the study problem at hand. Moreover, there were no previous studies on the impact of government bond rates on the performance of the equities market section.

Due to time and cost constraints, the research was limited to the Kenyan capital markets sector, which does not clearly indicate the current conclusion when other areas of the economy are included. Furthermore, if similar study were conducted in other countries, there would be greater ambiguity.

Considering the fact that the results relied on quantitative information, there were a number of significant problems, including the fact that some of the data was not easily available, particularly data on exchange rate variations. As a result, it came at a high price and took a long time to get. Because the data acquired was not used in its original form, it had to be manipulated and more computations were required. There were potential delays as a result of data processing and editing before to compilation.

5.6 Recommendations for Further Study

Exploring the influence of economic indicators on the savings rate is critical for banking system

policymakers, particularly the CBK and National Treasury, as well as financial sector practitioners and consultants. The current study was conducted in the setting of commercial banks; however, the same study might be replicated on other financial institutions and across other sectors of the economy to evaluate if the current study's findings hold true. The current study was conducted primarily in Kenya; however, new research may be conducted in Kenya, Africa, or throughout the world to see if the current findings of the studies are valid. The only economic variables included in this study were the lending interest rate, economic growth, inflation, and exchange rate variations. Other macroeconomic variables may be studied to see if they have an influence on the default rate.

Although this study only used secondary data, it may be followed up by primary data investigations. This might either support or refute the study's conclusions. Multiple linear regressions and correlation analyses were used as statistical analytical tools in this study. Additional statistical analytic approaches, such as descriptive statistics, cluster analyses, discriminant analysis, granger causality, and components analysis, can be integrated into future investigations.

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APPENDICES

APPENDIX I: DATA COLLECTION FORM

PERIOD	GDP	Population	FDI	Interest Rates	Inflation Rate	Exchange Rate Fluctuation

APPENDIX II: DATA USED

Loan Default Rate	Lending Interest Rate	Economic Growth	Inflation Rate	Exchange Rate Fluctuations	Time
39.40%	20.20%	2.20%	7.82%	-1.30%	2001-1
39.40%	19.69%	6.30%	7.13%	1.12%	2001-2
38.10%	19.49%	6.20%	6.44%	0.41%	2001-3
37.90%	19.89%	3.20%	5.74%	-0.33%	2001-4
37.86%	19.11%	4.70%	4.79%	-0.80%	2002-1
37.82%	18.54%	0.20%	3.84%	0.78%	2002-2
37.86%	18.13%	-2.50%	2.89%	0.18%	2002-3
37.70%	18.24%	0.50%	1.96%	0.92%	2002-4
36.50%	18.78%	-1.70%	3.93%	-3.71%	2003-1
35.98%	17.61%	4.00%	5.90%	-3.74%	2003-2
35.42%	14.82%	6.90%	7.80%	5.67%	2003-3
35.00%	14.10%	5.20%	9.82%	-2.42%	2003-4
33.00%	13.20%	6.70%	10.30%	4.28%	2004-1

32.00%	12.46%	5.00%	10.75%	0.07%	2004-2
30.00%	12.23%	3.20%	11.20%	6.29%	2004-3
29.00%	12.20%	5.30%	11.62%	-8.27%	2004-4
23.20%	12.44%	2.50%	14.15%	-3.01%	2005-1
14.60%	13.11%	7.40%	11.91%	1.58%	2005-2
11.20%	12.93%	7.40%	4.27%	-2.79%	2005-3
7.10%	13.02%	5.90%	7.56%	-2.31%	2005-4
6.70%	13.27%	4.10%	19.14%	-0.68%	2006-1
6.10%	13.75%	6.00%	10.93%	2.79%	2006-2
5.70%	13.59%	5.80%	13.85%	-1.63%	2006-3
5.00%	13.89%	5.20%	15.60%	-4.52%	2006-4
4.80%	13.66%	6.30%	5.90%	-0.89%	2007-1
4.20%	13.28%	8.90%	11.10%	-3.22%	2007-2
3.80%	12.96%	6.90%	11.70%	0.61%	2007-3
3.40%	13.32%	5.60%	12.00%	-6.62%	2007-4
4.50%	13.89%	-0.60%	21.80%	0.49%	2008-1
6.50%	13.99%	3.20%	29.30%	2.94%	2008-2
7.40%	13.27%	3.20%	28.20%	13.18%	2008-3
9.20%	14.44%	1.80%	27.70%	6.14%	2008-4
8.90%	14.77%	3.90%	14.60%	-0.71%	2009-1
8.70%	14.88%	2.10%	8.60%	-2.80%	2009-2
8.20%	13.83%	1.90%	6.74%	0.92%	2009-3
8.00%	14.80%	0.80%	5.32%	-0.48%	2009-4
6.18%	14.92%	6.60%	3.97%	1.84%	2010-1
6.21%	14.48%	7.60%	3.49%	3.83%	2010-2
6.96%	14.08%	7.90%	3.21%	1.31%	2010-3
6.24%	13.89%	11.60%	4.51%	0.18%	2010-4
6.01%	13.96%	7.50%	9.19%	1.69%	2011-1
5.30%	13.90%	6.60%	14.49%	5.01%	2011-2
4.81%	14.46%	6.10%	17.32%	9.87%	2011-3
4.45%	17.92%	4.40%	18.93%	-3.51%	2011-4
4.33%	20.05%	4.20%	15.61%	-8.72%	2012-1
4.46%	20.21%	4.30%	10.05%	1.46%	2012-2
4.60%	20.06%	5.00%	5.32%	-0.19%	2012-3
4.53%	18.32%	4.70%	3.20%	1.32%	2012-4
5.02%	17.90%	6.10%	4.11%	0.91%	2013-1
5.33%	17.43%	7.50%	4.91%	-1.75%	2013-2
5.24%	16.66%	6.40%	8.29%	2.58%	2013-3
5.18%	16.96%	3.50%	7.15%	-1.18%	2013-4
5.63%	17.00%	5.20%	6.27%	0.22%	2014-1
5.71%	16.68%	6.00%	7.39%	1.27%	2014-2

5.43%	16.00%	4.60%	6.60%	1.21%	2014-3
5.44%	15.98%	5.60%	6.02%	1.76%	2014-4
5.75%	15.62%	5.70%	6.31%	1.96%	2015-1
5.71%	15.57%	5.60%	7.03%	5.66%	2015-2
5.38%	16.30%	6.10%	5.97%	7.10%	2015-3
6.80%	17.35%	5.50%	8.01%	-1.75%	2015-4
7.68%	17.93%	5.00%	6.45%	-0.30%	2016-1
8.40%	18.15%	6.10%	5.80%	-0.73%	2016-2
8.77%	16.80%	5.20%	6.34%	0.31%	2016-3
7.30%	13.69%	7.20%	6.35%	0.60%	2016-4
9.50%	13.65%	5.20%	10.28%	1.34%	2017-1
9.91%	13.66%	4.40%	9.21%	0.12%	2017-2
10.45%	13.67%	4.40%	7.06%	0.00%	2017-3
12.30%	13.68%	5.10%	4.50%	-0.04%	2017-4
11.81%	13.61%	6.20%	4.18%	-1.72%	2018-1
11.97%	13.24%	6.00%	4.28%	-0.64%	2018-2
12.50%	12.71%	6.60%	5.70%	-0.29%	2018-3
12.70%	12.56%	6.50%	5.71%	1.40%	2018-4
12.78%	12.49%	5.50%	4.35%	-1.47%	2019-1
12.70%	12.48%	5.30%	5.70%	1.10%	2019-2
12.38%	12.47%	5.20%	3.83%	2.17%	2019-3
12.01%	12.35%	5.50%	5.82%	-1.38%	2019-4
12.54%	12.19%	4.90%	5.84%	2.19%	2020-1
13.13%	11.92%	-5.70%	4.59%	1.75%	2020-2
13.64%	11.85%	-1.10%	4.20%	1.85%	2020-3
14.10%	12.00%	-1.40%	5.62%	0.62%	2020-4