

**THE EFFECT OF SELECTED MACRO ECONOMIC VARIABLES  
ON NON-PERFORMING LOANS IN COMMERCIAL BANKS IN  
KENYA**

**BY**

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## DECLARATION

I declare this research project is my original work and has not been submitted to any other college, institution or university.

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This research project has been submitted for examination with my approval as the university supervisor.

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## **DEDICATION**

This research project is dedicated to the banking sector in Kenya to provide insight on impact of selected macroeconomic variables on Non-performing Loans in commercial banks in Kenya

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

**ARDL** - Autoregressive Distributed Lag Model

**CBK** - Central Bank of Kenya

**CPI** - Consumer Price Index

**GDP** - Gross Domestic Product

**M3** - Money Supply

**NPLR** - Non Performing Loan Ratio

**NPLs** - Non Performing Loans

**KNBS** Kenya National Bureau of Standards

## **ABSTRACT**

Nonperforming loans indicate the quality of banks' assets and is a vital pointer, among other indicators of economic performance and the banking sector performance in a country. However, in spite of collaborative efforts from players in the banking sector and regulating institutions, NPL levels registered in advanced economies as well as third world economies remain high. The banking industry in Kenya is considered among the most established, rapidly developing and leading in East Africa, thereby claiming the position of financial leader regionally. This study therefore, examines the effect of selected macro economic variables on NPLs in commercial banks in Kenya. The research used a descriptive research design and focused on the 42 banking institutions in Kenya. The research utilized secondary data and considered quarterly data for a period of 10 years from 2007 to 2016. Data was analyzed using descriptive and inferential statistics, which included correlation and pooled regression analysis. The Gretl statistical software was used to analyze the collected data. The findings established an insignificant negative relationship between the non-performing loan ratio and interest rates but a significant negative relationship between gross domestic product and the non-performing loan ratio. The result also found that the non-performing loan ratio had an insignificant positive relationship with exchange rates whereas the consumer price index had a significant positive relationship with the non-performing loan ratio while money supply had a significant negative relationship with the non-performing loan ratio. The study concluded that the level of nonperforming loans among Kenyan banks is influenced by economic growth, inflation and money supply. The study recommended that the government and other policy-making institutions should develop effective strategic mechanism to reduce the adverse effect of inflations and to institute policy measures, which ensure good economic performance and optimal amounts of supplied currency.

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

The banking industry is one of the key sectors that enhance economic growth in most of the world economies. The sector determines the growth of countries' economies and future sustainability by offering varying services, such as facilitating movement of money between countries and ensuring structured interaction between borrowers and savers (Muriithi & Louw, 2017). In a country, enhancing customers' confidence improves banking sector stability critical to sustainable economic development. However, from the economic crises experienced in 2007, the global banking sector has increasingly experienced bad debts, which mainly results from NPLs treated as a balance sheet cost leading to a reduction in the financial performance of a bank (Amuakwa-Mensah & Boakye-Adjei, 2014).

NPLs are a challenge to the banking sector, both in the industrialized and non-industrialized countries. Despite continued efforts to regulate lending activities of banks, NPLs remain a major problem both for global as well as country regulators. The combined NPLs rate exhibits significant differences across countries, mostly between industrialized and unindustrialized countries (Boudriga, Boulila & Jellouli, 2009). High levels NPL in a greater way affect lending by banks, recovery of an economy and ultimately growth of an economy. Economic growth has been observed to negatively respond to high levels of NPLs. To track NPLs efficiently, a collaborative effort is required from the private sector, governments, global financial institutions (Cmok, 2016). In the dynamic contemporary

economy, banks need to consider the macro-economic factors in order to manage the banking activities with minimum risk (Roy, Dey & Bhowmik, 2014).

The increase of NPLs affects banks' lending trends negatively as it increases asymmetric information concern of bank managers, which lead to adverse selection and moral hazard problems (Curak, Poposki & Pepur, 2012). The moral hazard hypothesis assert that low capitalized banks have relatively little capital to lose in case of a loan default, therefore low capitalization results in management, increasing the risk of the loans hold with the bank. However, the bad luck hypothesis predicts that macro economic factors influence NPL. Thus, if the GDP growth reduces, unemployment rises or interest rates fall, this increases the amount of non-performing loans. Hence, managers have to deal with lower quality loans by accruing additional resources, which results in higher operating costs followed by the lower efficiency (Quadt & Nguyen, 2016). The bad management hypothesis support that efficiency of cost influences NPLs since bad managers fails to efficiently monitor loan portfolios (Podpiera & Weill, 2008).

The situation of NPLs is not only a challenge worldwide, but also in Kenya. The Kenyan banking sector has experienced a rise in problematic loans with the majority of commercial banks expected to record growth in NPLs, (CBK, 2015). The figure of NPLs in the loan books of the domestic commercial banks operating in Kenya increased to ksh.120bn during the second last quarter of 2015 (Chege & Bichanga, 2016). Banking problems have been experienced in Kenya since 1986, hence the failure of more than 30 banks by the year 1998. Most Kenyan banks over the time have continued to report consistent levels of loan defaults since 1995 (Warue, 2013). In Kenya, high NPLs level experienced in the banking industry has hindered economic stability (Ombaba, 2013).

### **1.1.1 Macro Economic Variables**

Macroeconomic variables are elements important to the general economy, both at the national and regional level and that affects a significant part of the population instead of a few select individuals. These factors are external and beyond the control of the bank and determine the operational efficiency of commercial banks (Agade, 2014). Macroeconomic variables are the overall economic, regulatory and legal environment within which a bank operates its business. Quality of bank loans can be indirectly affected by Macroeconomic variables. These factors include the inflation and interest rates, real GDP growth, money supply and currency exchange rates.

Interest rate is the cost the borrower incurs to use money obtained from a lender or a financial intermediary. It can also be said to be the price a borrower pays to use funds borrowed from a lender/financial institutions or premium against borrowed resources (Ombaba, 2013). Lending interest rate designates price borrowers pay for funds obtained and thus, the debt service fee. Rise of interest rate results to additional debt obligation and the level of NPLs (Curak, Poposki & Pepur, 2012). When a real lending rate increase, the real value of the borrowers' debt also positively changes resulting in more expensive debts. Banks charging high interest are expectedly exposed to higher rate of defaults or NPLs (Tsumake, 2016). Interest rates are normally measure using the average lending rate of interest charged by commercial banks.

GDP is said to be the sum value of goods or services available in the market produced by an economy of a given country. It can also be defined as the income total earned by the people domiciled in a country (Anjom & Karim, 2016). A country's economic success in

indicated by among other factors, the GDP. The real GDP is an economic quantifies the value of economic output adjusted for price changes (Nanteza, 2015). The growth in GDP reflects a conducive economic environment that benefits both business units and households. In the conducive economic condition, households and business incomes are enhanced and borrowers' ability to service their debts is improved (Curak, Poposki & Pepur, 2012). The GDP growth rate is normally used to measure the performance of the economy.

The exchange rate is a medium of financial transactions between the countries. The entire import and export process of any country depends upon the exchange rate of its currency (Gurloveleen & Bhatia, 2015). Variability or stability of exchange rate fluctuation a major concern which determines the extent and direction of commerce and foreign trade. The exchange rate has a major role in international trade where it is used to fix prices and determine the nature of hedging to avoid risk associated with exchange rate (Ramasamy & Abar, 2015). Exchange rate may cause losses on foreign denominated loans, which is common in markets in developing countries. Changes in exchange rates may also affect households and business debt burden due to currency mismatch (Curak, Poposki & Pepur, 2012). Exchanges rates are normally measured by comparing the domestic currency per unit and a selected foreign currency rate.

Inflation can be defined as a general increase in the price of goods and services over time in a nation (Nanteza, 2015). The inflation in an economy is proxied by the Consumer Price Index. Alternatively put, the price rise is inflation and the same is decline of local currency in international stage (Ramasamy & Abar, 2015). High inflation levels can result to increase of borrowers' payment capacity by cutting down on the real value of debt

outstanding. In addition, an increase of inflation can reduce borrower's loan repayment capacity by cutting down real income if salaries or wages remain constant (Tsumake, 2016). Higher inflation in an economy may ease the payment of debt by affecting the outstanding real value (Klein, 2013). Inflation is measured by the inflation rate, which is calculated from the annual percentage change in the general price index (Consumer price Index) over the period

Money supply is a broad measure of money in an economy. The money supply or stock is the instantaneous total money available in circulation in an economy. Money supply is a critical variable to stabilize the economy because it can be used for immediate transactions. It acts as a medium between the exchanges of economic transactions, can be traded for its value in fact, it is a store of its value (Gurloveleen & Bhatia, 2015). Money supply and available funds in commercial banks have a direct relationship and therefore increase in money supply results to increase of interest earned by banks. An increase in money supply reflects an expansionary monetary policy and leads to the increase in output, but associated with the inflationary effect (Ofori-Abebrese, Pickson & Opare, 2016). Money supply is normally measured using the broad money supply (M3) in a country.

### **1.1.2 Non-Performing Loans**

A non-performing loan (NPL) is defined by Bhattarai (2014) as a loan where a borrower fails to repay the credit in accordance with the provisions in the contract. Therefore, NPL is the sum of money borrowed and which a borrower has failed to contractually service for the last 3 months (Bhattarai, 2014). It can also be defined as a form of financial assets where the lending bank is denied interest and or payment installments according to the



structured schedule (Anjom & Karim, 2016). Non-performing loans take a comparatively long time and does not have returns; the principal amount and interest accrued on the loaned amount remain unpaid for not less than three months (Ombaba, 2013). Another name of NPL can be stated as problem loan. The advanced amount is classified as a problem loan after the borrower fails to meet his obligation for a period not less than 3 months, but this may also depend on the contract terms (Anjom & Karim, 2016).

NPLs indicate the quality of credit in a bank's loan portfolio and by extension, the quality of credit of country's or region's banking sector (Ozili, 2017). High NPLs level in the system exposes the sector to systemic risk, which may result to deposits flight and increased friction in financial intermediation, which would subsequently result to decline in investment and growth. A high NPLs ratio is a precursor of a banking crisis (Nanteza, 2015). An increase in NPLs leads to increased value adjustment and provisions which results to lower profitability in the banking sector (Benazi & Radin, 2015). The fears associated with NPLs make it difficult for financial intermediaries to efficiently assign funds between economic units experiencing an investment deficit and those that are saturated (Curak, Poposki & Pepur, 2012).

NPLs are also used to indicate financial stability and especially the stability of the banking system (Sheefeni, 2015). The Non-performing loans ratio (NPLR) may point to the way in which banks manage credit related risks as it expresses the proportion of loan loss against the total amount of loan (Bhattarai, 2014). A high NPL ratio or a rising trend results to increase in provisions for nonperforming loans and hence, decline in banks' profit and capital adequacy ratio (slamo lu, 2015). An increase in the NPL ratio may point to decline in banking system performance and decline in loan portfolio quality (Festic & Beko, 2008).

The Non-performing loans ratio (NPLR) ratio is normally used to measure the percentage of a bank's issued loans that are not being serviced or with signs of failing to be serviced.

### **1.1.3 Effect of Macro Economic Variables and Non-Performing Loans**

The relationship between NPLs and the macro-economy can be explained on the basis that the quality of a loan portfolio is influenced by the systemic risks resulting from exposures to macroeconomic risk factors across banks (Sheefeni, 2015). The prevailing macroeconomic situation inevitably impacts borrower's financial position and their capacity to service debt. Thus, hostile economic shocks together with high capital cost and low interest margins have been established to cause NPLs (Amuakwa-Mensah & Boakye-Adjei, 2014). Credit expansion and decelerating share of the NPL ratio have yielded better results in banking sectors in a favorable macroeconomic environment (Festic & Beko, 2008). Growth of GDP impacts public earning, the resulting increase in economic power, including debtors power to pay credit while interest rate increase, which burdens debtors' cash flow, which triggers upsurge of defaulters or increase of NPLs (Yam, 2016).

An empirical examination by Tanaskovi and Jandri (2015) assessed the macroeconomic determinants of growth of NPL ratios and found an inverse relationship between GDP and NPL ratio. The authors also found that GDP, the ratio of foreign currency loans and exchange rate level changes positively with NPL ratio surge. Mondal (2016) examined effects of macroeconomic variables on the increase of NPLs revealed a negative correlation with the inflation rate and spread in the rate of interest and positively affected by GDP. Karahano lu & Ercan (2015) assessed the effects of macroeconomic factors on the NPL in the banking industry in Turkey and found that there exists a bidirectional correlation among

macro economic factors and the NPLR. Pepur (2012) empirically investigated the determinants of NPLs of banking systems in South east Europe and established that slow economic growth, high inflation rate and high interest rate are linked to higher levels NPLs

A survey by slamo lu (2015) explored the impact of macroeconomic factors on the combined NPL ratio of banks operating in Borsa Istanbul and established that changes in NPL ratio can be demonstrated using interest rate of commercial loan and public debt stock/GDP ratios. Klein (2013) examined NPLs in Europe and revealed that while NPLs respond to macroeconomic environments, like GDP growth, inflation and unemployment. Roy, Dey and Bhowmik (2014) analyzed the determinants of macro-economic variables on the NPL of domestic private commercial banks in Bangladesh. The authors found that the growth in GDP has an inverse impact on the NPLs ratio, while inflation had a direct impact on NPLs.

#### **1.1.4 Commercial Banks in Kenya**

Kenya's financial sector plays a powerful role in the financial system, especially in mobilizing savings and credit provision. The Kenya's banking sector is among the fastest growing both in east Africa and African continent as a whole. The Kenyan banks have experienced considerable growth in the past few years. The banking sector was robust and stable and registered enhanced performance in 2013 as demonstrated by a growth of 15.9% in the total net banking sector assets and an increase in Customer deposits of 13.5 per cent in that year (Lau, 2015). The sector's overall loan portfolio and loan advances changed from Ksh. 2.0 trillion in March 2015 to Ksh. 2.2 trillion in March the following year,

resulting in an increase of 20%. The increase in the loan book was contributed by increased demand for credit from all the economic sectors (CBK, 2016).

As at December 31, 2015, banking industry in Kenya consisted of the CBK as the regulator, 42 commercial banks and one mortgage finance firm (CBK, 2016). The total asset held by these banks was KSh. 3,199 Billion and outstanding Loans/advances stood at KSh. 1,531 Billion (Fusion Investment Management, 2015). All banks in Kenya are regulated by CBK, which is an independent body engaged with monetary and fiscal policies on behalf of the Kenyan government in addition to playing an oversight role in the Kenyan banking industry. The CMA provides additional oversight of listed banks. In Kenya, all banking institutions are mandated to comply with prudential regulations issued by CBK including maintaining with the CBK a prescribed liquidity and cash reserve levels (Akelola, 2012).

The banking industry in Kenya has been affected previously by both global and local financial crises. During the year 1980 and 2000, the financial industry in Kenya was branded with major financial disturbances which ended with downfall of a number of banks and others getting in and from receivership (Muriithi & Louw, 2017). As from 2015, the sector has seen 3 banks collapse which resulted to low consumer confidence in the sector and overall strength of the sector (AIB Capital, 2016). The value of sector-wide NPLs soared by 47.5% from ksh. 117.2billion in March 2015 to Ksh. 172.9billion in March 2016. This resulted in an increased ratio of gross NPLs to total loans of 7.8% in March 2016 from 5.7% in March 2015. Consequently, asset quality, illustrated as the ratio of net NPLs and gross loans deteriorated from 2.6% in March 2015 to 4.3% in the March of the following year (CBK, 2016).

## 1.2 Research Problem

NPL indicate the quality of banks' assets and is a vital pointer, among other indicators of economic performance and the banking sector performance in a country (Ozili, 2017). However, Škarica (2014) points out that in spite of collaborative efforts from players in the banking sector and regulating institutions, NPL levels registered in advanced economies as well as third world economies remain high. The decline in the loan portfolio quality remains a significant basis of banking system problems and financial crises in most industrialized economies (Messai & Jouini, 2013). In most emerging economies, the effective management of NPLs is hampered by unbalanced national insolvency regimes, in which some types of creditor are overly protected from foreclosure actions. To date, concerns associate with high NPLs levels are in the radar many emerging economies (Cmok, 2016).

The banking industry in Kenya is considered among the most established, rapidly developing and leading in East Africa, thereby claiming the position of financial leader regionally (Muriithi & Louw, 2017). However, The Kenyan banking system has been occasioned by crisis since 1986, which has led to the collapse of more than 40 commercial banks (Gitonga, 2014). For instance, the Kenyan banking industry in 2015 witnessed the downfall and liquidation of Dubai Bank Kenya Limited and the placement of Imperial Bank Limited under statutory management (Fusion Investment Management, 2015). Banking sector NPLs in Kenyan in December 2015 also increased by 36.04 per cent to KSh. 147.3 billion, where the proportion of gross NPLs and gross loans increasing at 6.8 per cent in the same period from 5.4 per cent in December 2014. Similarly, in the first

quarter of 2016 the sector was characterized by fluctuations in loans advanced, NPLs and provisions growth rates, which signaled elevated credit risks (CBK, 2016).

The empirical review on macroeconomic factors and NPLs relationship is quite extensive. A survey by Patra and Padhi (2016) explored the bank specific and macroeconomic determinants of nonperforming assets for different group of Indian commercial banks and revealed that the macroeconomic determinants' influence on nonperforming assets do not cut across banks as the banking practices and regulations varies based on the banking group. The study nevertheless examined both the bank specific and macroeconomic elements of NPLs. Karim et al (2010) explored the interrelationship between bank efficiency and NPLs in Singapore and Malaysia and observed that NPL reduces bank's cost efficiency while lower cost efficiency increases NPLs though the study focus is NPLs and bank efficiency.

A survey by Awuor (2015) assessed the effects of firm specific variables on NPLs in Kenya and found a relationship between liquidity, operational cost efficiency, earnings ability and levels of nonperforming loans to be positive though the focus of the research was bank specific factors. Onchomba (2014) in Kenya assessed the connection between macroeconomic elements and mortgage firms' NPLs and concluded that GDP growth rate, high rate of unemployment, high rate of real interest rate, loan losses reserve ratio, significantly increased non-performing loans but the context was specific mortgage institutions. A survey by Muasya (2009) explored effects of NPLs in commercial bank's financial performance and observed that NPLs significantly impacts performance of Kenya's commercial banks, but the focus was the connection between NPL and commercial bank's performance.

As per the reviewed studies, its observed majority of studies have been carried out in specific countries and macroeconomic factors are unsteady and shaky based on the country's prevailing state of the economy. Additionally, a series of studies focus on the effect of both bank specific and macroeconomic variables on NPLs. This study, therefore seeks to deviate from the most of prior studies, which gives attention to the combined impact of macroeconomic factors and bank-specific variables and focus only on macroeconomic variables. This opens up the research question, what effect do select macroeconomic factors have on NPLs in commercial banks in Kenya

### **1.3 Research Objective**

To determine the effect of selected macro economic variables on NPLs in commercial banks in Kenya

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

The study will be valuable to Kenya's banking institution's management, it will also contribute academic literature and also in the policy world. The management of banking institution both in Kenya may use the findings to identify a number of basic elements on how to reduce and mitigate the effect of macroeconomic factors on NPLs. The management of banking entities can also use the findings of the study to generate policies on how reduce non-performing loans.

The study findings will also contribute to policy where government, regulatory organization and other policy-making organizations come up with policies towards managing the increase of NPLs in the Kenyan-banking sector. The policy-making organizations can also use the findings to develop strategic policies on the management of

micro economic factors. Finally, the paper will add value to the academic community. Future researcher may use the study as for additional studies. The paper is also expected to contribute to theoretical and empirical literature on macroeconomic factors, NPLs and the banking industry.



## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

Chapter two outlines the theoretical review, which comprises of bad luck hypothesis, the moral hazard hypothesis and the theory of asymmetric information. The section also presents the determinants of NPLs in the banking sector, the empirical literature review, the conceptual diagram and summary of the literature reviewed.

### **2.2 Theoretical Review**

#### **2.2.1 The Bad Luck Hypothesis**

Berger and DeYoung (1997) developed the bad luck hypothesis. The essential argument of the bad luck hypothesis is that exogenous factors such as the slowdown of an economy affect NPLs which lead to banks incurring extra costs in managing these loans, this subsequently weakens cost efficiency of banks (Podpiera & Weill, 2008). Under this hypothesis, external events lead to an increase in banks' problem loan. Immediately the loan payment installment is delayed, the bank starts to expend extra managerial expense and effort in dealing with problem loans. Hence, as theorized in bad-luck hypothesis, there is expectation that increase in NPLs will result to decline in cost efficiency. Of important note, additional expenses related to problem loans make it appear, but not necessarily in reality, that low cost efficient results (Rajha, 2016).

According to the bad luck hypothesis due to macroeconomic factors such as poor economic performance due to decreased level of production, high unemployment, sector failure, failure of production firm, energy crisis or unexpected events including terrorist attacks.

Thus, due to the adverse economic initiatives in a country, individuals and firms' earnings and profits will decline, resulting to higher bad loans (Ahmad & Bashir, 2013). This means that, if there exists bad luck hypothesis; mitigation of external factors should be focused on by supervising bodies. The external factors to be considered should be those that may cause NPLs, and supervisors should formulate and enforce cautious guidelines to be strictly adhered to while approving loans to minimize NPLs (Dimitrios, Louri & Tsionas, 2016).

The bad luck hypothesis presuppose that external factors increase banks' NPLs. This results to banks incurring higher cost of operation while dealing with problem loans, which, subsequently, impedes efficiency of banks. The additional operating costs may emanate from a myriad of factors, including monitoring of moral hazard borrowers and collateral value, costs of recovering and sell of collateral in case of non-payment (Podpiera & Weill, 2008). The bad luck hypothesis support that NPLs is triggered simply by bad luck, including weather, unexpected changes in the price of certain products among others. In such circumstances, bearers of loans can allocate an allowance to cater for nonperformance in through provisions of problem loans, or insure the default risk.

### **2.2.2 Moral Hazard Hypothesis**

The moral hazard theory was formulated by Keeton and Morris (1987) and later advanced by Berger and DeYoung (1997). The theory argues that small banks in terms of capital respond to moral hazard inducements by raising loan portfolio riskiness, which, in the process, leads to higher NPLs on average in the future (Klein, 2013). The moral hazard theory points out that low capitalized bank are inclined to raise their earnings by increasing risk of the loan portfolio through advancing loans to borrowers not meeting quality

threshold, leading to future growth of NPLs. This practice by banks can be qualified as moral hazard since banks understand that their enterprises are properly capitalized and still decide to increase the loan portfolio riskiness. Thus, low financial capital can result in the future growth in NPLs (Ahmad & Bashir, 2013).

Under this theory, a financial institution with considerably less capital reacts to moral-hazard inducements by raising their credit portfolio risk, which leads to high NPLs on average. Hence, under the theory of moral hazard, low bank's financial capital Granger-causes high NPLs (Rajha, 2016). The moral hazard hypothesis support that low-capitalization banks increases NPLs. Therefore, an inadequately capitalized bank suffers from higher levels of NPLs. This moral hazard inducement of bank management leads unwarranted risk taking and soaring in the amount of nonperforming loans. According to the moral hazard hypothesis, nonperforming loans increase when the capitalization of the bank is decreasing (Quadt & Nguyen, 2016).

### **2.2.3 The Theory of Asymmetric Information**

Stiglitz and Weiss (1981) developed the theory of information asymmetry. Asymmetric information theory states that it is hard to isolate/filter good borrowers and bad ones. Asymmetric information problem arises from incomplete information available to the lender and conversely full information being available to a borrower regarding a transaction (Sheefeni, 2015). Information asymmetry denotes a situation in which firm owners/managers understands better risk scenario facing their business compared to lenders (Ombaba, 2013). Banks considering extending funding to prospective borrowers are confronted with information problem, to the extent the borrowers are more informed of

their firms than lenders are. As a result, banks often approving some loans that are ex-post unprofitable (Khatib, 2010).

Information asymmetry seeks to explain the condition in which not all parties involved in a transaction have relevant information. The theory explains the party with more information is able to negotiate an optimal deal as compared to the other with less information. The party with less information about a specific item in a transaction may therefore make either right or wrong assessment of the same transaction (Ombaba, 2013). Lending by banks is thus procyclical since lenders increase their credit portfolio during the business cycle upturn and decrease lending during downturn. Therefore, when there is an increase in macroeconomic risks, the share of risky loans to aggregate assets reduces, since risks impedes ability of a bank to forecast investment opportunities (Khatib, 2010).

## **2.3 Determinants of Nonperforming Loans**

The determining indicators of NPLs are classified into two broad groups; internal and external factors. External factors also referred to macro-economic variables include currency rates, real interest rates or unemployment rates or the indexes whereas internal factors or bank specific factors include size, profitability or cost efficiency measurements (Karahano lu & Ercan, 2015).

### **2.3.1 Macro Economic Variables**

According to Amuakwa-Mensah and Boakye -Adjei (2014), NPLs accumulation is mainly attributed to factors including economic decline, volatility in the macroeconomic environment, deterioration of trade terms, high rate of interest, overreliance on abnormally highly priced inter-bank lending, and moral hazard. Tanaskovi and Jandri (2015) posit

that the key macroeconomic elements influencing growth in NPL share are growth in GDP, exchange rate, stock prices, inflation, interest rate, (un)employment rate, and house prices. GDP growth represents a major impediment to quality of loan portfolio, and credit expansion risk is assumed procyclical within GDP growth (Festic & Beko, 2008). As a pointer to price stability, low level of inflation is critical to economic growth, which results in the debtors' ability to pay back the loans (Curak, Poposki & Pepur, 2012).

Depreciation of currency increases the borrower's costs of servicing debts where the local currency is used to service foreign currency denominated loans (Tanaskovi & Jandri , 2015). Depending on the regime of exchange rate, appreciation of foreign currency deteriorates the NPL ratio, especially in instances where a higher share of loans denominated in the foreign currency (Festic & Beko, 2008). Interest rate surge can weaken the repayment capacity of a borrower, particularly where rates prescribed in the contract vary. Increased debt burden resulting from increased interest rates leads to a higher number of NPLs. High inflation may make servicing of debt easier by changing negatively loan's real value. It may also affect negatively the real income of a borrower if wages remain fixed (Klein, 2013).

### **2.3.2 Bank Specific Factors**

Bank-level factors denote factors internal to a bank. Bank-specific characteristics include bank size, loan growth, solvency ratio (capital adequacy), and bank performance. The bank-specific factors are concerned with the management of a bank and firm-level features and can include indicators bank capitalization, provisioning of policy, profitability, status of ownership and industry concentration (Boudriga, Boulila & Jellouli, 2009). Bank size

mirrors bank's ability to withstand the problem associated with information asymmetry, which results in lower NPLs levels. Growth of assets is related to the development of the management team with high capability in management and credit management. Major banks with a significant amount of assets are expected to have more complex credit risk management mechanism compared to small-sized banks (Yam, 2016).

Bank profitability may increase managers' risk taking behavior. Banks recording high profits are less pressured by creation of revenue and thus less limited in engaging in risky credit advancement (Boudriga, Boulila & Jellouli, 2009). The growth of loans mirrors credit policy of a bank and while in pursuit of bigger market share and improving performance in the short-term, banks overlook credit standards. A bank's solvency level, which normally proxied by the capital and asset ratio depicts a bank's capital strength. A high level of capital empowers banks to neutralize shocks that may stem up in credit market (Curak, Poposki & Pepur, 2012). The capital adequacy ratio may serve as a risk taking control tools for banks to curtail indulge in excessive risk preventing them from becoming insolvent through recapitalization (Boudriga, Boulila & Jellouli, 2009)

## **2.4 Empirical Review**

Ofori-Abebrese, Pickson and Opare (2016) in Ghana assessed the macroeconomic factors that influence commercial banks' loan performance. The study used data collected from 2008 to 2015. Using the ARDL bounds test of co-integration as the estimation technique, the study found evidence of long-term relationship among the studied variables. The study concludes that macroeconomic factors that influence loan performance are inflation and T-bills.

Etale, Ayunku and Etale (2016) examined relationship between NPLs and performance of Nigerian banks from 1994 to 2014. The research used the Augmented Dickey Fuller Unit Root test and the ordinary least squares technique to analyze data. The research findings indicated that bad loans and doubtful loans had a statistically significant negative influence on return on capital employed, while sub-standard loans had statistically negative insignificant impact on return on capital employed. The results revealed that high levels of NPLs would reduce bank performance in the long term.

Yam (2016) explored the relationship between macroeconomics and bank specific factors, NPLs, commercial bank's sustainability and performance in Indonesia. Data covered a period of 10 years from 2004 to 2013. The study analyzed the impact of gross domestic product; interest rate; unemployment, currency rates and inflation. The bank specific variables comprised of total assets, capital strength, growth in credit and liquidity. The researcher concluded that macroeconomic and bank specific factors have a major impact on NPLs and sustainability of banking performance.

Chege and Bichanga (2016) assessed the effect of NPLs on Kenya's commercial bank's financial performance. A descriptive survey and a census of the 44 commercial banks was undertaken. Data was gathered using a data collection sheet for a 5-year period between 2011 and 2015. Through multiple regression it was established that nonperforming loans had a statistically major effect on financial performance. The research found that other bank specific factors, including bank size, capitalization, operating costs had a statistically significant effect on financial performance but liquidity had an insignificant effect on financial performance.

Sheefeni (2015) in Namibia assessed the determinants, specific to banks, of NPLs in commercial banks. The paper used the unit root test, time series modeling, cointegration tests and impulse response functions and error decomposition models for the period between 2014 and 2001. The findings of the study were that the return on assets and return on equity, loan average assets ratio, log of total assets are the primary determinants of NPLs. The result found an inverse relationship between NPLs and return on assets as well as return on equity.

Škarica (2014) analyzed the determinants of changes in the NPLs ratio in a number of European developing markets through a panel data methodology for seven Countries in Central and Eastern Europe from 2007 to 2012. The study considered Romania, Bulgaria, Czech Republic, Latvia, Croatia and Slovakia and Hungary. The 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 gross domestic product, inflation and unemployment.

Agade (2014) explored the effect of macroeconomic factors on Kenya's banking sector operational efficiency. The study employed descriptive and used secondary data that was obtained from publications, government and private financial reports, newsletters, journals and business magazines. Through the regression model, the research revealed that the key factors affecting the operational efficiency of the Kenyan banking sector included exchange rates, lending rates, GDP and inflation. The study concluded that the relationship between inflation and operational efficiency of the banking sector in Kenya is negative and significant.



Murungi (2014) assessed how macroeconomic variables affect the financial performance of Kenya's Insurance Companies. The study employed descriptive correlation research design and the population was made up of 46 Insurance firms using annual secondary data from 2009 to 2013. This study found that interest rate, gross domestic product, claims and expense ratio were significant, but the inflation rate, currency rates, money supply and firm size were statistically insignificant. The study concluded that interest rate, gross domestic product, claims ratio and expense ratio were the major macroeconomic determinants of insurance firms' financial performance.

Gitonga (2014) investigated the how macroeconomic factors affect credit risk of commercial banks in Kenya banking industry from 1990 to 2013 using annual secondary data. The study used an OLS regression equation, applying an error correction model on the equation. The study found that exchange rates between the US dollar and the Kenyan shilling had a significant but negative effect on default risk. Domestic credit to the private sector by the commercial banks and inflation had an inverse and a major impact on credit risk, but interest rates had a positive and a major effect on credit risk.

Using the panel regression model, Amuakwa-Mensah and Boakye-Adjei (2014) investigated NPLs determinants in Ghana's banking industry. The paper's findings were that both banks-specific variables like previous year's NPL, the size of the bank, net interest margin, and loan growth for the current year) and macroeconomic variables like consumer price index, economic growth and forex rate fluctuations significantly impacts NPLs in the banking industry.

Mesai and Jouini (2013) explored the determinants of NPLs in three countries (Italy, Greece and Spain) using a sample of 85 banks from 2004 to 2008. The macroeconomic factors considered by the study included the rate of GDP growth, lending rates of interest and unemployment rate. Using a panel data methodology, the result revealed that non-performing loans vary inversely with the gross domestic product growth rate, the banks' profitability and assets and directly with the unemployment rate, the loan loss reserves and lending rates.

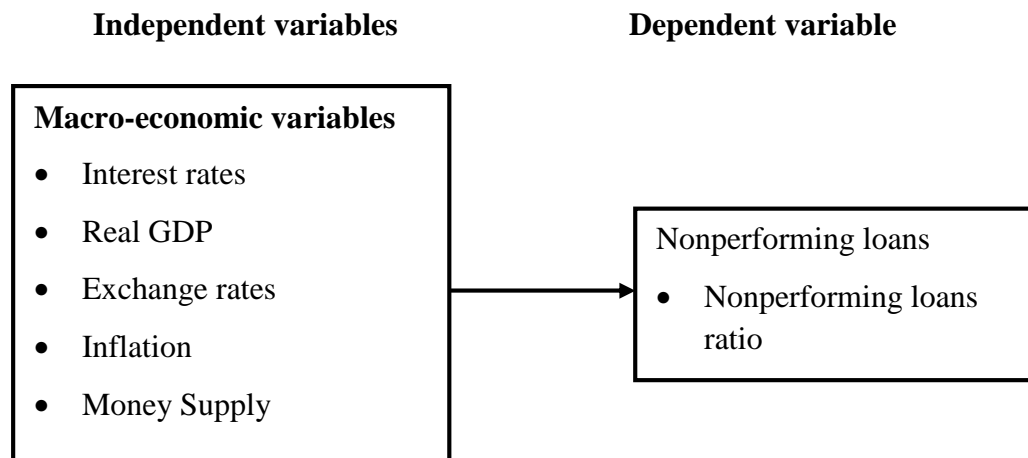
Warue (2013) assessed the effect of bank-specific and macroeconomic factors on NPLs in commercial banks in Kenya. The study used both secondary and a census of 44 commercial banks in Kenya between 1995 and 2009. The results of the research revealed that per capita income had an inverse and significant effect on NPL across various bank categories of 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 indicators contribute to NPLs performance at higher degree relative to macroeconomic factors.

Beck Jakubik and Piloiu (2013) assessed the macro-economic factors of nonperforming loans in seventy five countries. Through the a panel data methodology the study revealed that the growth of GDP, share price volatility, forex rate fluctuations and rates of interest affects in a big way levels of NPL. The study found that with regards to exchange rates, the relationship depends on the level foreign exchange denominated loans to unhedged clients which may be adverse in economies with pegged or managed system of exchange rates. With regard to security prices, the effect was significant in economies with high stock market relative to GDP ratio.

## 2.5 Conceptual Framework

A conceptual model shows the relationship among variables. According to the bad luck hypothesis macroeconomic factors such as poor economic performance, high interests' rates, inflation, money supply or unexpected events including external shocks influence loan payment hence non-performing loans. The information asymmetric theory also suggests that macroeconomic risks increase the share of risky loans to aggregate assets reduces. Figure 2.1 indicates the conceptual framework for this research comprising of non-performing loans as the dependent variable and real interest rates, real GDP, exchange rates, inflation and money supply as the selected independent variables.

**Figure 2.1 Conceptual Framework**



## 2.6 Summary of Literature Review

The chapter reviewed the bad luck hypothesis, the moral hazard hypothesis and the theory of information asymmetry to explain the reasons behind non-performing loans. The bad-luck hypothesis posits that NPL result due to external factors, while the moral hazard predicts that NPL arise due to a banks low-capitalization. The information asymmetry

theory holds that non-performing loan result due unavailability of complete information to a lender, whereas at the same time the borrower having more information about a transaction of interest. Therefore, various theoretical underpinnings give a diverse view on the whether macroeconomic variables influence non-performing loans.

On the review studies, authors like Sheefeni (2015), Ofori-Abebrese, Pickson and Opare (2016), Amuakwa-Mensah and Boakye-Adjei (2014) Messai and Jouini (2013) & Beck Jakubik and Piloiu (2013) assessed the impact of both macro-economic and bank specific indicators on nonperforming loans. In Kenya, Warue (2013) explored bank-specific and macro-economic variables and their effect on commercial bank's performance. Chege and Bichanga (2016) in Kenya assessed the effect of NPLs on commercial banks' financial performance an indication that most empirical studies explored both the impact of bank specific and macro-economic factors on NPLs with majority of them concentrating on the effect of NPLs on banks' performance.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

Chapter three presents the research design, the population of the study and the data collection procedure. The chapter also previews various diagnostic tests and the data analysis method.

### **3.2 Research Design**

A research design is a flow of conditions used in collecting and analyzing data with a primary objective combining relevance and research purpose. A research design is also the strategy employed in connecting the conceptualized research problem to the pertinent (and achievable) empirical research (Wyk, 2012). This research used a descriptive research design. A descriptive design enables collection of large amounts of data from a sizable population in a highly economical way. A descriptive research also aims at providing an accurate and valid representation of the factors or variables that pertain or are relevant to the research question (Wyk, 2012).

### **3.3 Population of the Study**

According to information available in Central Bank of Kenya website (2017), as at 31<sup>st</sup> December 2016 the banking sector comprised of 42 commercial banks. This study therefore focused on the 42 banking institutions since commercial banks control the highest market share compared to other form of banking institutions.

### **3.4 Data Collection**

The research only utilized secondary data. Secondary data on macroeconomic factors was obtained from various sources, among them the KNBS and the Central Bank of Kenya (CBK). Secondary data on non-performing loans was obtained from the banking institutions annual financial reports. The study considered quarterly data for a period of 10 years from 2007 to 2016.

### **3.5 Diagnostic Tests**

The study carried out various diagnostic tests among them multicollinearity and normality tests. Multi-collinearity means that two or more variables are correlated and gives insignificant information and the Variance Inflation Factor (VIF) was used to establish the presence of multicollinearity. Normality test was used to establish the possibility of the data set being normally distributed and the study used skewness and kurtosis for normality test.

### **3.6 Data Analysis**

Data was analyzed using descriptive statistics and inferential statistics, which included correlation and pooled regression analysis. The Gretl statistical software was used to analyze the collected data.

#### **3.6.1 Analytical Model**

The model was specified as follows

$$NPL = f(IR, GDP, ER, CPI, MS)$$

Assuming a linear relationship exists, the model was rewritten as follows

$$NPL_t = \beta_0 + \beta_1 IR_t + \beta_2 GDP_t + \beta_3 ER_t + \beta_4 CPI_t + \beta_5 MS_t + \mu$$

Where,

$NPL_t$  stands for non performing loan and was determined through the Non performing loans Ratio (NPLR) at time  $t$

$IR_t$  stands for real interests rates and was measured using the quarterly lending rate of interest at time  $t$

$GDP_t$  stands for real GDP measured using the natural log of the real GDP on a quarterly basis at time  $t$

$ER_t$  stands for exchange rate measured using the quarterly Kenya shilling per unit of US dollar rate at time  $t$

$CPI_t$  stands for consumer price index measured using the quarterly consumer price index at time  $t$

$MS_t$  stands for money supply measured using quarterly broad money supply(M3) at time  $t$

$\beta_0$  &  $\mu$  indicates the constant and the error term respectively

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$  indicates the beta coefficients of the regression equation

### **3.6.2 Test of Significance**

The study used p values to determine the statistical significance of the research variables at 95% confidence level. Therefore, a p value of less than 0.05 was considered an indication of significance while p values greater than 0.05 was considered an indication of insignificance.



# CHAPTER FOUR: DATA ANALYSIS, RESULTS AND INTERPRETATION

## 4.1 Introduction

This chapter presents the results and the interpretations of the analyzed data. The chapter contains the descriptive summary statistics, the graphical presentations, correlation and the pooled regression analysis and finally interpretations of the findings.

## 4.2 Descriptive Statistics

This section comprises of the summary statistics and the graphical analysis.

### 4.2.1 Summary Statistics

**Table 4.1: Summary Statistics**

Variable	NPLR	IR	Ln GDP	ER	CPI	Ln MS
Mean	0.055696	15.788	13.61	83.814	125.47	14.117
Median	0.053771	15.33	13.607	84.871	130.09	14.226
Minimum	0.01023	12.87	13.359	62.646	78.458	13.231
Maximum	0.091	20.34	13.906	103.89	175.18	14.831
Std. Dev.	0.019458	2.0681	0.1602	11.493	29.035	0.49839
C.V.	0.34936	0.131	0.011771	0.13713	0.23141	0.035306
Skewness	-0.09391	0.71023	0.25076	-0.03978	0.006855	-0.28368
Kurtosis	-0.23253	-0.39027	-1.0759	-0.73856	-1.2106	-1.1494

**Source: Research Findings**

Table 4.1 indicates that the average non-performing loans ratio for the commercial banks was 0.0557, which indicates that 5.57% of the loans advanced by Kenyan Commercial banks are non –performing loans. The results also indicate that the average interest rate over the study period was 15.788 with minimum and maximum values 12.87 and 20.34

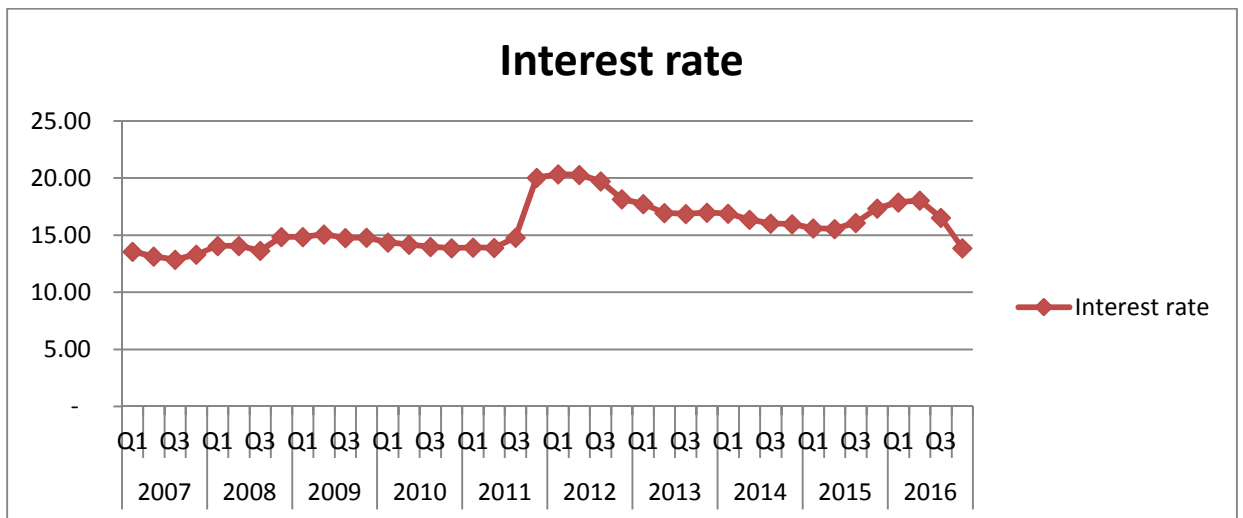
respectively. The tables also indicate that the average gross domestic value (GDP) over the considered period was 13.61 with minimum and maximum values of 13.359 and 13.906 respectively. Further, on the table it is observed that the average exchange rate value was 83.814 with minimum and maximum values of 62.646 and 103.89 correspondingly. Finally, the result shows that the average CPI was 125.47 while the average value of money supply was 14.117 respectively. Additionally, the table indicates that the skewness and kurtosis values were all less than 2 which indicates that the variables were normally distributed.

### 4.3 Graphical Analysis

The section depicts the trend of the variables under the study period to observe their movements in graphical terms

#### 4.3.1 Interest Rates Trend

Figure 2.1 shows the interest rates trend from 2007 to 2016

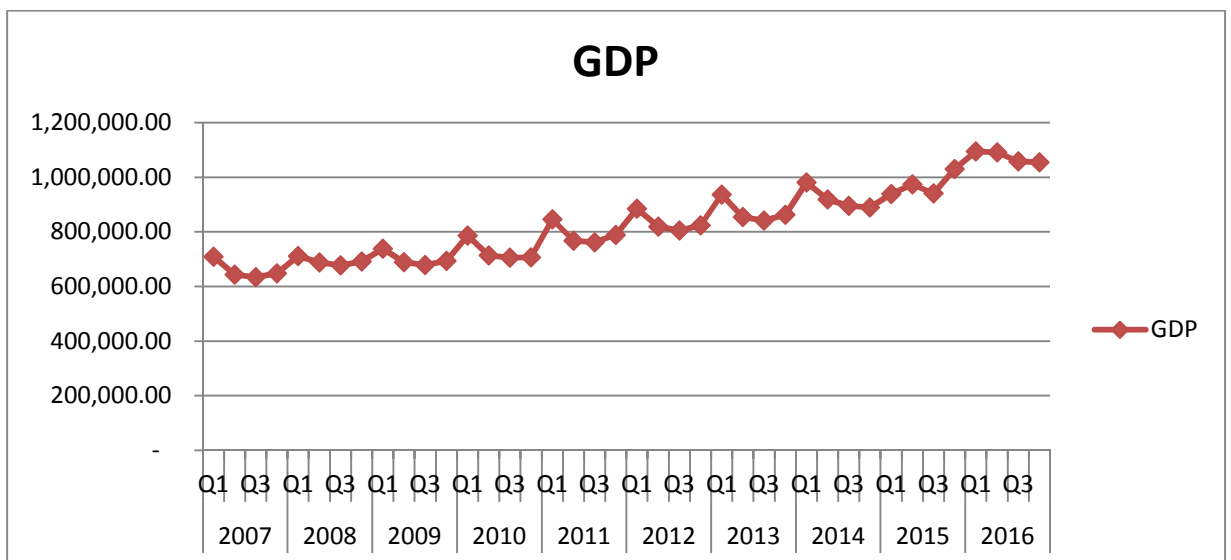


Source: Research findings

Figure 4.1: Interest Rates Trend

Figure 2.1 indicates that interest rates were gradually increasing from the first quarter of 2007 up to the fourth quarter of 2011 and then a sharp decrease was witnessed although in 2012. The figure also indicates interest rates decline in 2013 and 2014 but they started increasing in 2015 with a sharp increase in the fourth quarter of 2015 up to the third quarter of 2016 and then a sharp decline in the third quarter of 2016.

### 4.3.2 GDP Trend

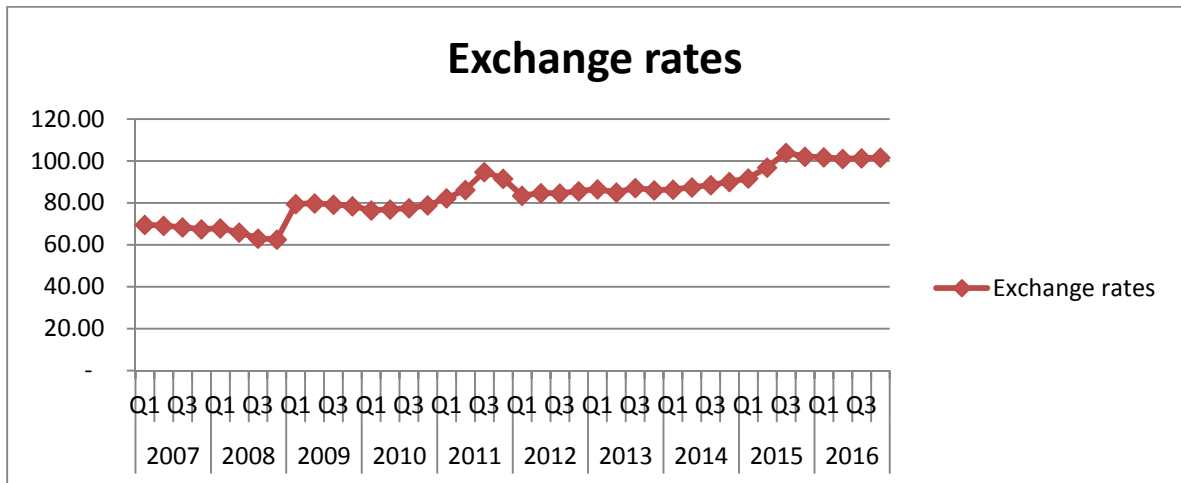


**Source: Research findings**

**Figure 4.2: GDP Trend**

Figure 4.2 show the GDP trend from 2007 to 2016. The figure shows that GDP had been gradually increasing from 2007 although up to 2016 although some declines were witnessed in third quarter of 2010, 2012 and 2013.

### 4.3.3 Exchange Rates Trend

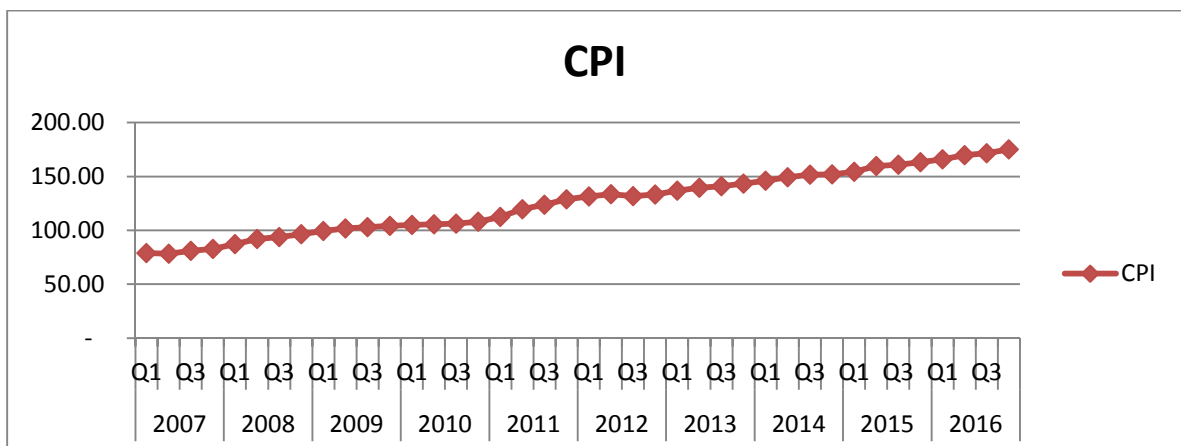


Source: Research findings

Figure 4.3: Exchange Rates Trend

The findings of figure 2.3 indicate that exchange rates had been on increase from 2007 although up to 2016. The figure shows a steady rise in the forex exchange rates in the fourth quarter of 2008 and 2011.

### 4.3.4 CPI Trend

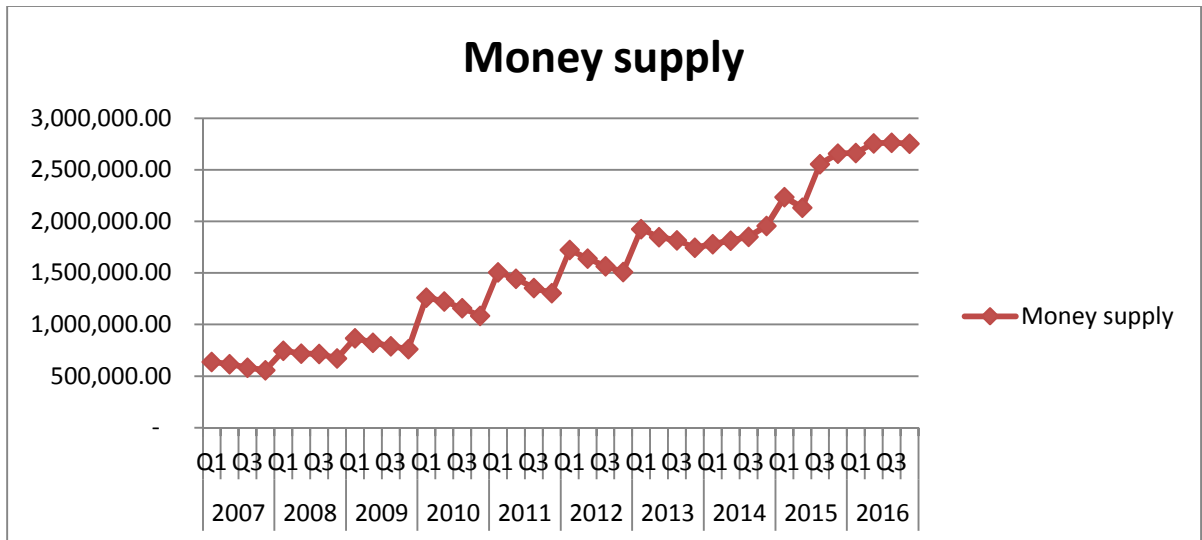


Source: Research findings

Figure 4.4: CPI Trend

Figure 4.3 shows the consumer prices index (CPI) from 2007 to 2009. The figure indicates that the consumer price index had been steeply increasing over the considered period. This indicates that inflation has been on the increase in Kenya.

### 4.3.5 Money Supply Trend

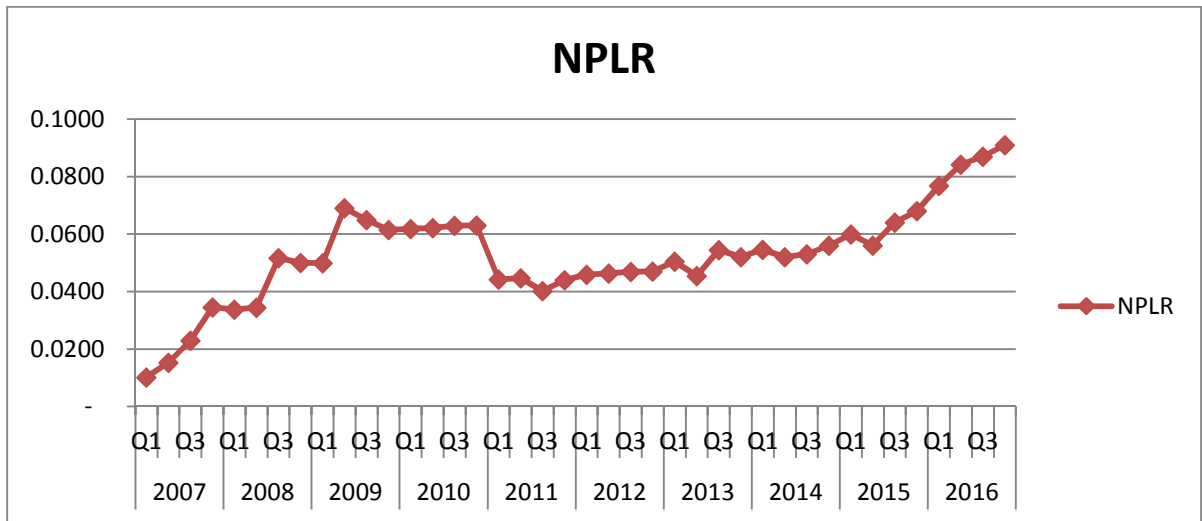


**Source: Research findings**

**Figure 4.5: Money Supply Trend**

Figure 4.4 show the trend of money supply over the considered period between 2007 and 2016. The figure indicates that the amount supplied by the central bank had been gradually increasing over the period with declines in money supply been witnessed in some quarter over the period.

### 4.3.6 NPLR Trend



Source: Research findings

Figure 4.6: NPLR trend

Figure 4.5 shows the non-performing loans trend for the period between 2007 and 2016.

The figure indicates that the trend of nonperforming loans in Kenyan banks has been steadily rising over the considered period.

## 4.4 Correlation Analysis

**Table 4.2: Correlation Matrix**

		NPLR	IR	Ln GDP	ER	CPI	Ln MS
NPLR	Pearson Correlation	1					
IR	Pearson Correlation	.023	1				
	Sig. (2-tailed)	.616					
Ln GDP	Pearson Correlation	.382**	.436**	1			
	Sig. (2-tailed)	.009	.005				
ER	Pearson Correlation	.422**	.466**	.616**	1		
	Sig. (2-tailed)	.004	.002	.000			
CPI	Pearson Correlation	.460**	.499**	.571**	.518**	1	
	Sig. (2-tailed)	.002	.001	.000	.000		
Ln MS	Pearson Correlation	-.190	.552**	.165	.330*	.214	1
	Sig. (2-tailed)	.309	.000	.305	.038	.187	

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

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

### Source: Research findings

The correlation results on table 4.2 indicates that the non performing loans ratio had a weak and positive correlation with interest rates, gross domestic product (GDP), exchange rates and the consumer price index (CPI). The table also shows that the non-performing loans ratio had a weak negative correlation with the amount of money supplied. Additionally, all

the correlation values are below 0.75, which indicates that there is no multicollinearity among the research variables.

## 4.5 Regression Analysis

This research used the pooled regression method to determine the existing relationship between NPLR and Macro-economic variable. Table 4.3 depicts the obtained results.

**Table 4.3: Pooled Regression Analysis**

Model 1: Pooled OLS, using 40 observations

Dependent variable: NPLR

Robust (HAC) standard errors

	<i>Coefficient</i>	<i>Std. Error</i>	<i>z</i>	<i>p-value</i>
const	0.324713	0.192282	1.689	0.0913
IR	-0.098076	0.0621406	-1.578	0.1145
Ln GDP	-0.163661	0.0586226	-2.792	0.0052
ER	0.0104652	0.00858255	1.219	0.2227
CPI	0.147985	0.0649646	2.278	0.0227
Ln MS	-0.00420593	0.00138123	-3.045	0.0023
Mean dependent var	0.055696	S.D. dependent var		0.019458
Sum squared resid	0.007763	S.E. of regression		0.015110
R-squared	0.474268	Adjusted R-squared		0.396955
F(5, 34)	5.685400	P-value(F)		0.002272
Log-likelihood	114.1882	Akaike criterion		-216.3765
Schwarz criterion	-206.2432	Hannan-Quinn		-212.7126

**Source: Research Findings**

From table 4.3 the following regression equation was derived

$$NPLR_t = 0.324713 - 0.1636GDP_t + 0.1479CPI_t - 0.0042MS_t + \varepsilon$$



The results on the table indicate that the R squared value (Coefficient of determination) is 0.474268 which means that 47.43% of the variation in the dependent (NPLR) is explained by the independent variables (the macro-economic factors). The table also indicates that the F statistics value is 5.685400 and the P value is 0.002272, which is less than 0.05 significance value. This is an indication that the regression model is significant and indicates that the model is fit.

The derived regression equation indicates that there is an insignificant negative relationship between the non-performing loan ratio and interest rates but there is a significant negative relationship between gross domestic product and the non-performing loan ratio. The findings further show that the non-performing loan ratio had an insignificant positive relationship with exchange rates. Further, the table shows that the consumer price index had a significant positive relationship with the non-performing loan ratio while money supply had a significant negative relationship with the non-performing loan ratio.

#### 4.4.1 Test for Multicollinearity

**Table 4.4 Collinearity Diagnostics**

Variable	Tolerance	VIF
IR	.619	1.616
Ln GDP	.624	1.603
ER	.410	2.439
CPI	.441	2.268
Ln MS	.360	2.778

Dependent Variable: NPLR

**Source: Research Findings**

The collinearity diagnostic tests on table 4.4 show that all the tolerance values were above the 0.2 cut point while the variance inflation factors (VIF) were between 1 and 10. This indicates that there was no multicollinearity among the variables.

#### **4.6 Interpretation of the Findings**

The results of the research revealed an insignificant negative relationship between the non-performing loan ratio. This indicates that the level of interest rates does not significantly affect the level of nonperforming loans among commercial banks in Kenya. A study Gitonga (2014) however found that interest rates had a positive and a major effect on credit risk. The study found that money supply had a significant negative relationship with the non-performing loan ratio. This indicates that there is an inverse relationship between money supply and non-performing loans in the banking sector in Kenya. As such, a research by Warue (2013) concluded that bank-specific indicators contribute to NPLs performance at higher degree relative to macroeconomic factors.

The findings also obtained that gross domestic product had a significant negative relationship between gross domestic product and the non-performing loan ratio. This indicates that a decrease in GDP results to an increase in the level of performing loan and that a country's economic performance and growth significantly affects the level of nonperforming loans in the banking sector. Similarly, Mesai and Jouini (2013) revealed that non-performing loans vary inversely with the gross domestic product growth rate. Škarica (2014) also established that the main reason of the high NPLs level was the slow-down of an economy, which is demonstrable through large coefficients of gross domestic product and inflation.

The findings revealed that non-performing loan ratio had an insignificant positive relationship with exchange rates. This is an indication that interest rates fluctuations do not affect the level of nonperforming loans in the banking sector in Kenya. However, a study by Beck Jakubik and Piloiu (2013) indicated that with regards to exchange rates, the relationship depends on the level foreign exchange denominated loans to unhedged clients which may be adverse in economies with pegged or managed system of exchange rates. Amuakwa-Mensah and Boakye-Adjei (2014) however found that forex rate fluctuations significantly impacts NPLs in the banking industry.

Further, the findings obtained that the consumer price index (CPI) had a significant positive relationship with the non-performing loan ratio. This indicates that an increase in inflation leads to an increase in nonperforming loans because inflation has a direct effect on the non-performing loan ratio. Ofori-Abebrese, Pickson and Opare (2016) concluded that macroeconomic factors that influence loan performance are inflation and T-bills. Agade (2014) also concluded that inflation and operational efficiency of the banking sector in Kenya is negative and significant.

## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

Chapter five summarizes the findings of the study, provides the conclusions as per the research findings and make recommendations as per the conclusions of the research. The chapter also discusses the limitation of the research and suggests areas, which may require further research.

### **5.2 Summary**

The aim of this research was to the effect of selected macro economic variables on NPLs in commercial banks in Kenya. The study focused on non-performing loans as the dependent variable and real interest rates, real GDP, exchange rates, inflation and money supply as the selected independent variables. This research used a descriptive research design and targeted on the 42 banking institutions in Kenya. The research only utilized secondary data, which was analyzed using descriptive statistics, and inferential statistics, which included correlation and pooled regression analysis.

The descriptive analysis results obtained that the average non-performing loans ratio for the commercial banks was 0.0557 whereas the average interest rate over the study period was 15.78 while the average gross domestic value (GDP) over the considered period was 13.61 respectively. The results also observed that the average exchange rate value was 83.814 whereas the average CPI was 125.47 while the average value of money supply was 14.117 respectively. An analysis of the trend of the variables indicated a steady increase in

interest rates, GDP, exchange rates; consumer prices index (CPI) and money supply over the considered period between 2007 and 2016.

The correlation findings revealed that the non-performing loans ratio had a weak and positive correlation with interest rates, gross domestic product (GDP), exchange rates and the consumer price index (CPI) but a weak negative correlation with the amount of money supplied. The findings obtained that 47.43% of the variation in the dependent (NPLR) was explained by the independent variables, the F statistics value was 5.685400, and the P value was 0.002272, which indicated that the regression model is significant.

The derived regression equation found an insignificant negative relationship between the non-performing loan ratio and interest rates but a significant negative relationship between gross domestic product and the non-performing loan ratio. The result also found that the non-performing loan ratio had an insignificant positive relationship with exchange rates whereas the consumer price index had a significant positive relationship with the non-performing loan ratio while money supply had a significant negative relationship with the non-performing loan ratio.

### **5.3 Conclusions**

The research found that the non-performing loan ratio had an insignificant and negative relation with the rates of interest. The research therefore concludes that the levels of interest rates do not significantly affect the level of nonperforming loans among commercial banks in Kenya.

The study established that exchange rates had an insignificant relationship with non-performing loan ratio hence the conclusion that exchange rates fluctuations do not affect the level of nonperforming loans in the banking sector in Kenya.

The research obtained that gross domestic product had a significant negative relationship between gross domestic product and the non-performing loan ratio. The research concludes that the level of performing loan and is significantly affected by a country's economic performance and growth.

The findings obtained that the consumer price index (CPI) had a significant positive relationship with the non-performing loan ratio hence the conclusion that an increase in inflation leads to an increase in nonperforming loans because inflation has a direct effect on the non-performing loan ratio.

Finally, the study revealed that money supply had a significant negative relationship with the non-performing loan ratio hence the conclusion that there is an inverse relationship between money supply and non-performing loans in the banking sector in Kenya.

#### **5.4 Recommendations**

The researcher concluded that the levels of interest rates do not significantly affect the level of nonperforming loans among commercial banks in Kenya. Nevertheless, the study recommends that the management of Kenya's commercial banks should ensure the adverse effects of interest fluctuations do not affect the level of nonperforming loans in their institutions.

The researcher also concluded that exchange rates fluctuations do not affect the level of nonperforming loans in the banking sector in Kenya. Nevertheless, the study recommends that the management of Kenya's commercial banks should ensure they have effective measures to mitigate exchange rates fluctuations since exchange rates may also affect other functions of the banks

The findings of the study led to the conclusion that the level of performing loan and is significantly affected by a country's economic performance and growth, inflation levels and money supply. This study thus recommends that the government and other policy-making institutions should develop effective strategic mechanism to reduce the adverse effect of inflations and to institute policy measures, which ensure good economic performance and optimal amounts of supplied currency.

## **5.5 Limitations of the Study**

This study considered a few selected macroeconomic variables among them interest rates, GDP growth, exchange rates, inflation and money supply but there are other macroeconomic factors like oil prices, foreign direct investments, unemployment, national income and many others. The findings of the study is thus based on the explored macro-economic factors.

The study also focused on the Kenya's commercial banks however; there are other financial institutions like microfinance banks, credit only microfinance's, savings and cooperatives credit societies, insurance firms and others financial institutions. The findings therefore will be generalized to the Kenyan commercial banks and not the other types of financial institutions.

## **5.6 Suggestion for Further Research**

This study focused on interest rates, GDP growth, exchange rates, inflation and money supply but there are a variety of other macroeconomic factors. The study thus recommends an additional study using other macroeconomic factors among them oil prices, foreign direct investments, unemployment and national income.

The study also recommends a similar study based on the other types of financial institutions like pension firms, mutual funds, insurance firms and microfinance institutions. Finally, the study also suggests an additional study on the effect of micro-economic factors on non-performing loans among banks in Kenya.



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## APPENDICES

### Appendix I: List of Commercial Banks in Kenya

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

**Source: Central bank of Kenya (2017)**



## Appendix II: Research Data

Year	Quarter	IR	GDP	ER	CPI	MS	NPLR
2016	Q4	13.88	1,055,138.00	101.73	175.18	2,753,500.00	0.0910
	Q3	16.55	1,058,375.00	101.34	171.56	2,761,800.00	0.0870
	Q2	18.06	1,091,008.00	101.04	169.76	2,755,900.00	0.0842
	Q1	17.87	1,094,567.00	101.90	165.92	2,662,200.00	0.0768
2015	Q4	17.35	938,452.24	102.08	163.27	2,658,200.00	0.0680
	Q3	16.09	941,388.53	103.89	160.93	2,556,000.00	0.0640
	Q2	15.57	973,401.23	97.01	159.71	2,133,400.00	0.0560
	Q1	15.62	1,029,804.84	91.81	154.48	2,234,800.00	0.0599
2014	Q4	15.99	889,416.35	90.04	152.09	1,957,492.20	0.0560
	Q3	16.04	895,161.45	88.49	151.62	1,850,994.00	0.0530
	Q2	16.36	918,833.17	87.43	149.27	1,814,700.00	0.0520
	Q1	16.91	981,001.70	86.33	145.99	1,779,118.00	0.0546
2013	Q4	16.99	862,535.49	86.15	143.25	1,744,233.00	0.0520
	Q3	16.86	841,814.39	87.17	140.99	1,815,433.00	0.0545
	Q2	16.97	854,348.30	84.98	139.46	1,849,167.00	0.0454
	Q1	17.73	936,746.19	86.50	136.72	1,924,700.00	0.0505
2012	Q4	18.15	823,766.04	85.71	133.35	1,509,222.00	0.0470
	Q3	19.73	805,573.48	84.61	131.78	1,564,173.00	0.0469
	Q2	20.30	818,825.41	84.76	133.63	1,640,561.00	0.0464
	Q1	20.34	885,368.19	83.54	131.36	1,723,349.00	0.0459
2011	Q4	20.04	789,245.00	91.52	128.81	1,305,511.00	0.0440
	Q3	14.79	761,159.00	94.85	123.88	1,355,670.00	0.0403
	Q2	13.91	767,418.00	86.33	119.56	1,444,592.00	0.0447
	Q1	13.92	845,860.78	82.21	112.41	1,505,853.00	0.0443
2010	Q4	13.87	707,158.87	78.94	108.07	1,086,504.00	0.0630
	Q3	13.98	705,260.19	77.58	106.32	1,160,438.00	0.0629
	Q2	14.19	713,363.99	76.98	105.65	1,224,547.00	0.0621
	Q1	14.39	786,481.00	76.49	105.01	1,261,646.00	0.0618
2009	Q4	14.80	693,523.00	78.45	104.07	761,007.00	0.0815
	Q3	14.76	678,697.00	79.25	102.90	789,807.00	0.0800
	Q2	15.09	688,912.00	79.81	101.91	824,550.00	0.0791
	Q1	14.87	737,906.34	79.58	99.50	866,800.00	0.0799
2008	Q4	14.87	691,916.00	62.65	96.38	673,720.00	0.0901
	Q3	13.66	677,124.00	63.03	93.75	716,890.00	0.0517
	Q2	14.06	687,316.00	65.93	92.14	719,543.00	0.0345
	Q1	14.06	710,887.00	67.88	87.18	747,127.00	0.0338
2007	Q4	13.32	647,553.00	67.45	82.68	557,650.00	0.0345
	Q3	12.87	633,710.00	68.35	80.90	581,440.00	0.0230
	Q2	13.14	643,248.00	69.16	78.46	615,595.00	0.0153
	Q1	13.56	709,240.00	69.60	78.90	638,440.00	0.0102