Bank Regulation and Level of Non-Performing Loans in Commercial Banks in Nakuru County Kenya

¹Muhanji Indeje Geoffrey, ²Joseph Theuri

¹ Correspondent Author, MBA Finance, School of Business, Kenyatta University, Kenya

² Lecturer, Department of Accounting and Finance, Kenyatta University, Kenya

ABSTRACT

The study sought to determine the effect of bank regulation and level of nonperforming loans in commercial banks in Nakuru County Kenya. The specific objectives of the study were to explore the effect of capital adequacy on the level of nonperforming loans in commercial banks in Nakuru County Kenya, to find out the effect of asset quality on the level of nonperforming loans in commercial banks in Nakuru County Kenya, to evaluate the effect of liquidity management on the level of nonperforming loans in commercial banks in Nakuru County Kenya, to examine the effect of management efficiency on the level of nonperforming loans in commercial banks in Nakuru County Kenya and to determine the moderating effect of macroeconomic factors on the relationship between bank regulation and level of nonperforming loans. The literature review focused on portfolio theory of investment, capital asset pricing theory and the capital buffer theory of capital adequacy. The primary data was collected using structured questionnaires and secondary data was collected from the banking survey 2017 and central bank of Kenya annual supervisory reports. The study employed multiple linear regression analysis and the finding revealed that there exist a negative and statistically insignificant relationship between capital adequacy and non-performing loans. It was also observed that there exist a negative and statistically insignificant relationship between liquidity management and non-performing loans. On the other hand, there exist a positive and statistically significant relationship between asset quality and non-performing loans. Similarly, there exist a positive and statistically insignificant relationship between management efficiency and non-performing loans. Finally, the findings indicated that macroeconomic factors have moderating effect on the relationship between bank regulations and non-performing loans in commercial banks in Nakuru County. It was concluded that asset quality positively influences non-performing loans while management efficiency influence positively the non-performing loans. Similarly, liquidity management exerts a negative influence on non-performing loans. Finally, capital adequacy influence negatively on non-performing loans. The study recommends that Central Bank of Kenya should regularly access lending behavior to ensure compliance with banking regulations to avoid increasing incidences of non-performing loans. In addition, Central Bank of Kenya should closely monitor banks with deteriorating asset quality. Further, Central Bank of Kenya should strictly monitor the economic sector and ensure that banks provide adequate provisions for loans to mitigate risks of default. Furthermore, banks should maintain a good balance on deposits and lending out loans and adhere to regulators decisions about monetary policies. Finally, banks should increase the operational efficiency of operation weakness and improve corporate governance on the sanction of loans and Central Bank of Kenya should focus on managerial performance in order to detect banks with potential increases in non-performing loans.

Key Words: Capital Adequacy, Asset Quality, Liquidity Management, Management Efficiency, Macroeconomic Factors, Nonperforming Loans, Bank Regulation, Commercial Banks in Kenya, Central Bank of Kenya

Key Words:

DOI: DOI 10.35942/ijcfa.v2i2.132

Cite this Article:

Muhanji, G., & Theuri, J. (2020). Bank Regulation and Level of Non performing Loans in Commercial Banks in Nakuru County Kenya. *International Journal of Current Aspects in Finance, Banking and Accounting*, 2(2), 59-76. <https://doi.org/10.35942/ijcfa.v2i2.132>

1. Introduction

The financial sector in most developed nations had undergone through deregulation, whereby their government policy makers either removed or reduced state regulations that were governing financial institutions. This is because policy makers are convinced that implementation of deregulation policies will increase financial systems performance and efficiency, these policies aim towards enhancing competition, services, offers, packages and regional rivalry of banks. This process of deregulation has led to mixed consequences which rely on sector environment preceding the process of deregulation and kind of measures that are implemented. Hence deregulation of asset column of the statement of financial position that has focused on liberalization of the size and bank rates of interest on lending that led to the enhancement in productivity and competence of banks in Turkish and Norwegian. Furthermore, the deregulation policies consisting competition on rates of deposit did not have an impact on the efficiency levels as there was a decline in productivity of banks in United States of America (Kumbhakar, Lozano-Vivas, KnoxLovell, & Htekhar, 1999). Cooke committee (predecessor of the current Basel committee on bank supervision) originated two theories namely the micro prudential theory and macro prudential theory. In regards to the micro prudential regulation, banks sources finances from government insured deposits which helps to reduce bank runs creating a moral hazard problem because it leads the management of banks to take greater risks as they expect to be bailed out by the government in case of insolvency (Mwongeli, 2016).

Micro prudential regulation requires banks to take Prompt Corrective Action to restore its capital ratio if and when losses occur. The researchers further stated that macro prudential regulation aims at reducing as much as possible the financial impact that is felt in an economy when majority of commercial banks decide to dispose of their assets at the same time in order to cover their losses especially when the assets are similar as real estate properties thus significant reduction in markets price of assets. This was evidence at the time the globe experienced a financial crisis in the period 2007-2008 and commercial banks will also cut down on lending which will increase the cost of borrowing. This theory is presumed to be applicable in all deposit taking financial institutions whether insured or not thus regulation is required to monitor the activities and ensure adherence of statutory guidelines by financial institutions (Hanson, Kashyap, & Stein, 2011). Capital adequacy has an impact on stakeholder confidence towards a firm and it is the main parameter of measuring the financial performance of commercial banks According to (Jumreornvong, Chakreyavanich, Treepongkaruna and Jiraporn, 2018). Capital adequacy is the amount of capital a bank or other financial institution has to have as required by its financial regulator (Demerjian, Owens & Sokolowski, 2018). This is usually expressed as a capital adequacy ratio of equity as a percentage of risk-weighted assets. Capital adequacy determines the capacity of a bank in terms of meeting the time liabilities and other risks such as credit risk, operational risk; etc. It helps cushion the bank against potential losses and hence protects the interests of the bank's

depositors and other lenders. One of the bank regulations which affect the level of non-performing loans (NPL) is the asset quality (Ariff and Shawtari, 2019). Asset quality also referred to as loan quality has been defined as the overall risk attached to the various assets held by an individual or institution (Arrawatia, Dawar, Maitra & Dash, 2019). It is most commonly used by banks to determine how many of their assets are at financial risk and how much allowance for potential losses they must make. The most common assets requiring a strict determination of asset quality are loans, which can be non-performing assets if borrowers default on repayment obligations. Risk managers often assess the quality of assets by assigning a numerical ranking to each asset depending upon how much risk is involved (Ombaba, 2013). In Kenya, as a move to ensure assets quality the Government has made significant changes over the last decade to the Banking Act (Cap 488) and Prudential Guidelines to strengthen arrangements in relation to bank licensing, corporate governance, capital adequacy, risk classification of assets and overall risk management (Kassem, & Sakr, 2018).

Liquidity management is a concept that is receiving serious attention all over the world especially with the current financial situations and the state of the world economy. The concern of business owners and managers all over the world is to devise a strategy of managing their day to day operations in order to meet their obligations as they fall due and increase profitability and shareholder's wealth (Witmer, 2019). Liquidity management, in most cases, are considered from the perspective of working capital management as most of the indices used for measuring corporate liquidity are a function of the components of working capital (Hartman-Glaser, Mayer & Milbradt, 2019). The importance of liquidity management as it affects corporate profitability in today's business cannot be over emphasized. The crucial part in managing working capital is required maintaining its liquidity in day-to-day operation to ensure its smooth running and meets its obligation. Liquidity plays a significant role in the successful functioning of a business firm. The determinants of non-performing loans and the effects of macroeconomic variables on NPLs has been the concern of many researchers in the banking literature (Petkovski, Kjosevski and Jovanovski, 2018). Some researchers observed that an expansionary phase of the economy features relatively low NPLs, as both consumers and firms face a sufficient stream of income and revenues to service their debts. Vardar and Özguler (2015) draw heavily on the linkages among the nonperforming loans and different macroeconomic and bank-specific factors in the Turkey banking industry during 2007-2013. Their results suggest that there exists consistent and strong long-run relationship among these variables.

1.1 Bank Regulation

Financial regulation is the governing laws and rules for financial institutions that have been put in place by the government which enables financial institutions to maintain system integrity facilitated by statutory requirements, restrictions and guidelines. (Agbomdakaw 2010). The researcher also stated that regulations intend to maintain market transparency, to license the financial services providers, enforce relevant guidelines and restrictions, prosecuting misconduct cases, protecting depositors, investors, maintaining steadiness of financial systems. The regulations are enforced by the government regulator which is Central Bank of Kenya (CBK) and other international regulators as International Monetary Fund (IMF), Bank of International Settlement (BIS) and World Bank. The Banking Act CAP 488 and CBK Act CAP 491 and various prudential guidelines governs the banking sector by formulating and enforcing implemented regulations which protects the interest of both depositors and creditors to reduce the risks of unsafe and unsound business conditions to transact business that can result to massive bank failures.

According to Njoroge (2016), the CBK formulates and executes financial policies that are aimed to achieve and maintain steadiness of prices and promoting the liquidity, solvency and prosper function of a steady market centered financial systems and to support economic policies of the government. The CBK formulates and conducts monetary policy to keep overall inflation within the available margin at 2.5 percent.

The CBK attain its fiscal policy targets by Open Market Operations which involves the purchasing and selling of qualified securities to control the currency supply and credit. Open Market Operations is also used to stabilize interim interest rates after CBK buys investments on an open market; it elevates commercial banks funds to enhance their expansion on loans facilitating increase in money supply. A foreign and local regulator entails the Capital adequacy, asset quality, management efficiency, earnings and liquidity (CAMEL) ratings to evaluate how sound are financial institutions by CBK setting a ceiling of 4 percent above its Central Bank Rate (CBR) of 10 percent on credit facilities with the Cash Reserves Ratio (CRR) of 5.25 percent Njoroge, Bank Supervision Annual Report (2016). As indicated by Jumreornvong *et al* (2018), capital adequacy has an impact on stakeholder confidence towards a firm and it is the main parameter of measuring the financial performance of commercial banks. Demerjian, Owens and Sokolowski (2018) posit that Capital adequacy is the amount of capital a bank or other financial institution has to have as required by its financial regulator. This is usually expressed as a capital adequacy ratio of equity as a percentage of risk-weighted assets. Capital adequacy determines the capacity of a bank in terms of meeting the time liabilities and other risks such as credit risk, operational risk; etc. It helps cushion the bank against potential losses and hence protects the interests of the bank's depositors and other lenders. Mwai (2017) indicated that compliance of capital requirements by banks increases the performance and acts as a buffer in that regulators require banks that have fallen on the regulatory threshold are required to raise additional capital. Ariff and Shawtari (2019) assert that one of the bank regulations which affect the level of non-performing loans is the asset quality. Asset quality also referred to as loan quality has been defined as the overall risk attached to the various assets held by an individual or institution (Arrawatia, Dawar, Maitra & Dash, 2019). It is most commonly used by banks to determine how many of their assets are at financial risk and how much allowance for potential losses they must make. The most common assets requiring a strict determination of asset quality are loans, which can be non-performing assets if borrowers default on repayment obligations. Risk managers often assess the quality of assets by assigning a numerical ranking to each asset depending upon how much risk is involved (Ombaba, 2013). In Kenya, as a move to ensure assets quality the Government has made significant changes over the last decade to the Banking Act (Cap 488) and Prudential Guidelines to strengthen arrangements in relation to bank licensing, corporate governance, capital adequacy, risk classification of assets and overall risk management (Kassem, & Sakr, 2018). As indicated by Witmer (2019), Liquidity management is a concept that is receiving serious attention all over the world especially with the current financial situations and the state of the world economy. The concern of business owners and managers all over the world is to devise a strategy of managing their day to day operations in order to meet their obligations as they fall due and increase profitability and shareholder's wealth. Liquidity management, in most cases, are considered from the perspective of working capital management as most of the indices used for measuring corporate liquidity are a function of the components of working capital (Hartman-Glaser, Mayer & Milbradt, 2019).

According to Oxford Economic Research Association (2006), financial regulation is measured by

the financial sector improvement in growth that is compared by financial performance prior to latest regulations being affected and the performance once the new regulation is affected. In addition, it's measured by use of surveys that demonstrate growth in outcomes of the market that have resulted from regulation. International comparisons can also be used by analyzing the outcomes in various countries that are comparable but that have different regulatory structures. The bank regulations adopted by this study included capital adequacy, asset quality, liquidity management and management efficiency. These regulations were adopted because Credit risk is represented by the existence of non-performing loans (bad loans), provision for losses of loans and loans loss problems. Therefore, bank needs to be careful in advancing loans as there is a greater risk which follows it in a situation where the loan is defaulted. It is when such risks materialize that loans turn to be non-performing (Nigusse, 2018). Credit risk is represented by the existence of non-performing loans (bad loans), provision for losses of loans and loans foe problems (Jimenez and Saurina, 2006). Credit risk is termed as that which occurs when a bank grants a loan, and, is not either in full or in partial terms repaid to the bank. Since loans and advances are more profitable than any other assets, a bank is willing to lend as much of its funds as possible (Tesfai, 2015). But banks have to be careful about the safety of such advances. Therefore, bank needs to be careful in advancing loans as there is a greater risk which follows it in a situation where the loan is defaulted. It is when such risks materialize that loans turn to be non-performing. Credit risk is represented by the existence of non-performing loans (bad loans), provision for losses of loans and loans foe problems (Jimenez and Saurina, 2006). Credit risk is termed as that which occurs when a bank grants a loan, and, is not either in full or in partial terms repaid to the bank (Campbell, 2007). Since loans and advances are more profitable than any other assets, a bank is willing to lend as much of its funds as possible (Tesfai, 2015). But banks have to be careful about the safety of such advances Therefore; bank needs to be careful in advancing loans as there is a greater risk which follows it in a situation where the loan is defaulted. It is when such risks materialize that loans turn to be non- performing.

1.2 Nonperforming Loan

Muriithi (2014), Non-Performing Loan is that loan that is about to be defaulted or is already defaulted when the payments of both principal and interest are in arrears exceeding ninety days, or the interest payable for ninety days has been capitalized by refinancing or has been delayed by agreement. Similarly, Awuor (2015) indicated that Non Performing Loans generally refers to those loans which have become non-income generating over a prolonged period. NPLs are an expense that declines a banks execution of income. As indicated by Mikiko (2003), loan defaults are inevitable in any lending and banks will try to minimize the risks to be associated with defaulters. NPLs are defaulted loans or at risk of being defaulted as payments of principal and interest are not able to be made on time. In most cases payments of loans that have not been received for a period of three months consecutively are considered to be non-performing.

Non-performing loans (NPLs) are a monumental challenge to the banking sector in Kenya and a major concern to the regulator. NPLs have been increasing ever since from 2012 to 2017 which implies that there are challenges that commercial banks have been experiencing since 2011 in their loan recovery plans and in addressing NPLs thus leading to losses in the banking sector. This is further justified by the Central Bank of Kenya (CBK) bank supervision report for 2017, where it was indicated that the banking sector in Kenya recorded a decline in asset quality as a result of an increase in NPLs ratio. (CBK, 2017)

The ratio of bank NPLs to the non-performing loans ratio among Kenyan lenders rose to a 10-year high in the third quarter of the year 2018 as commercial banks struggled with loan defaults in a tough economic environment. The rise has mainly been driven by business borrowers and has affected largely banks in tier 2 and 3, a research report by Standard Investment Bank showed. Businesses in the country have struggled with a tough operating environment this year as credit growth ground to a halt on the back of a year-old rate capping law and a prolonged electioneering (Okello, Kirori & Ndiao, 2019).

2. Statement of the Problem

Non-performing loans (NPLs) are a monumental challenge to the banking sector in Kenya and a major concern to the regulator. Total gross loans were 5.989 percent in 2015. Since 2003 when the aforesaid ratio stood at an all-time high of 34.9 percent the NPLs have consistently declined to an all-time low of 4.429 percent in 2011. However, the NPLs have been increasing ever since to 4.594 percent in 2012, 5.046 percent in 2013, and 5.455 percent in 2014 and to 5.989 percent in 2015 (IMF, 2016). The foregoing implies that there are challenges that commercial banks have been experiencing since 2011 in their loan recovery plans and in addressing NPLs. This is further justified by the Central Bank of Kenya (CBK) bank supervision report for 2015, where it was indicated that the banking sector in Kenya recorded a decline in asset quality as a result of NPLs ratio increasing from 5.6 percent in December 2014 to 6.8 percent in December, 2015 (CBK, 2015). According to the International Monetary Fund (IMF) statistics, the ratio of bank NPLs to the non-performing loans ratio among Kenyan lenders rose to a 10-year high in the third quarter of the year 2018 as commercial banks struggled with loan defaults in a tough economic environment (Okello, Kirori & Ndiao, 2019). The rise has mainly been driven by business borrowers and has affected largely banks in tier 2 and 3, a research report by Standard Investment Bank showed. Businesses in the country have struggled with a tough operating environment this year as credit growth ground to a halt on the back of a year-old rate capping law and a prolonged electioneering.

Mwai (2017) studied the relationship between capital adequacy requirements and financial performance of commercial banks in Kenya. Nzoka (2015) conducted a study to establish the effect of asset quality on commercial banks financial performance in Kenya, Awuor (2015) evaluated effects of selected bank specific factors on non performing loans amongst commercial banks in Kenya. Mwongeli (2016) on the other hand examined the effect of regulations of financial performance of bank finally; Macharia (2016) assessed the determinants and profitability of commercial banks in Kenya. The study sought to enrich the foregoing by determining the effect of bank regulation on level of nonperforming loans in commercial banks in Nakuru County Kenya. This study thus focused on the effect of bank regulation in respect to the levels of NPLs.

3. Objectives of the Study

The main objective of the study was to determine the effect of bank regulation on level of nonperforming loans in commercial banks in Nakuru County Kenya.

The specific objectives of the study were:

- i. To explore the effect of capital adequacy on the NPLs in commercial banks in Nakuru County Kenya.
- ii. To find out the effect of asset quality on the NPLs in commercial banks in Nakuru County Kenya

- iii. To evaluate the effect of liquidity management on the NPLs in commercial banks in Nakuru County Kenya
- iv. To examine the effect of management efficiency on the NPLs in commercial banks in Nakuru County Kenya
- v. To determine the moderating effect of macroeconomic factors on the relationship between bank regulation and NPLs.

4. Theoretical Review

4.1 Portfolio Theory of Investment

Portfolio theory of investment was pioneered by Markowitz (1952). The theory states that, it is possible to construct an efficient frontier of optimal portfolios offering the maximum possible expected return for a given level of risk. This theory tries to maximize portfolio expected return for a given amount of portfolio risk, or equivalently minimize risk for a given level of expected return, by carefully choosing the proportions of various assets. Although Portfolio Theory is widely used in practice in the financial industry and several of its creators won a Nobel Prize for the theory, in recent years the basic Portfolio Theory have been widely challenged by fields such as behavioral economics (Markowitz 1952) Portfolio theory is a mathematical formulation of the concept of diversification in investing, with the aim of selecting a collection of investment assets that has collectively lower risk than any individual asset. That this is possible can be seen intuitively because different types of assets often change in value in opposite ways. For example, when prices in the stock market fall, prices in the bond market often increase, and vice versa. A collection of both types of assets can therefore have lower overall risk than either individually. But diversification lowers risk even if assets' returns are not negatively correlated indeed, even if they are positively correlated (Markowitz, 1952).

More technically, portfolio theory models assets return as a normally distributed (or more generally as an elliptically distributed random variable), define risk as the standard deviation of return, and model a portfolio as a weighted combination of assets so that the return of a portfolio is the weighted combination of the assets' returns. By combining different assets whose returns are not perfectly positively correlated, portfolio theory seeks to reduce the total variance of the portfolio return. Portfolio theory also assumes that investors are rational and markets are efficient (Sharpe, 1964). Portfolio theory was developed in the 1950s through the early 1970s and was considered an important advance in the mathematical modeling of finance. Since then, many theoretical and practical criticisms have been leveled against it. These include the fact that financial returns do not follow a Gaussian distribution or indeed any symmetric distribution, and those correlations between asset classes (Sproul, 1998).

4.2 Capital Asset Pricing Theory

This theory was first proposed by William Sharpe (1964). Capital Asset Pricing Theory model is used to determine a theoretically appropriate required return of an asset, to make decisions about adding assets to a well-diversified portfolio. Parallel work was also performed by Treynor, (1961) and Lintner, (1965) CAPM extended Harry Markowitz's portfolio theory to introduce the notions of systematic and specific risk. According to him, all investors will hold the market portfolio, leveraging or de-leveraging it with positions in the risk-free asset in order to achieve a desired level of risk. CAPM decomposes a portfolio's risk into systematic and specific risk. Systematic risk is the risk of holding the market portfolio. As the market moves, each individual asset is more or less affected. To the extent that any asset participates in such general market moves, that asset

entails systematic risk. Specific risk is the risk which is unique to an individual asset. It represents the component of an asset's return which is uncorrelated with general market moves (Lintner, 1965).

No matter how much we diversify our investments, it's impossible to get rid of all the risk. As investors, we deserve a rate of return that compensates us for taking on risk. The capital asset pricing model (CAPM) helps us to calculate investment risk and what return on investment we should expect. Here we look at the formula behind the model, the evidence for and against the accuracy of CAPM, and what CAPM means to the average investor (Sharpe, 1964). When the CAPM was first introduced, the investment community viewed the new model with suspicion, since it seemed to indicate that professional investment management was largely a waste of time. It was nearly a decade before investment professionals began to view the CAPM as an important tool in helping investors to understand risk. The key element of the model is that it separates the risk affecting an asset's return into two categories. The first type is called unsystematic, or company-specific, risk.

The long-term average returns for this kind of risk should be zero. The second kind of risk, called systematic risk, is due to general economic uncertainty. The CAPM states that the return on assets should, on average, equal the yield on a risk-free bond held over that time plus a premium proportional to the amount of systematic risk the stock possesses. (Markowitz 1952). The treatment of risk in the CAPM refines the notions of systematic and unsystematic risk developed by Markowitz in the 1950s (Markowitz, 1952). Unsystematic risk is the risk to an asset's value caused by factors that are specific to an organization, such as changes in senior management or product lines. For example, specific senior employees may make good or bad decisions or the same type of manufacturing equipment utilized may have different reliabilities at two different sites. In general, unsystematic risk is present due to the fact that every company is endowed with a unique collection of assets, ideas and personnel whose aggregate productivity may vary. A fundamental principle of modern portfolio theory is that unsystematic risk can be mitigated through diversification. That is, by holding many different assets, random fluctuations in the value of one were offset by opposite fluctuations in another. For example, if one fast food company makes a bad policy decision, its lost customers will go to a different fast food establishment. The investor in both companies will find that the losses in the former investment are balanced by gains in the latter (Markowitz, 1952). Systematic risk is risk that cannot be removed by diversification. This risk represents the variation in an asset's value caused by unpredictable economic movements. This type of risk represents the necessary risk that owners of a firm must accept when launching an enterprise.

Regardless of product quality or executive ability, a firm's profitability was influenced by economic trends. In the capital asset pricing model, the risk associated with an asset is measured in relationship to the risk of the market as a whole (Sharpe, 1964). Kabiru (2002) indicated that the principles of portfolio analysis play a great role in the management of credit risk. The effect of credit risk management practices adopted by financial institutions has led to diversifying their exposure limits across the borrowers and among various types of debt facilities. Capital asset pricing model (CAPM) developed by William Sharp is well applicable in investment decisions. It describes the identification of an investment's return and diversification of risk on the investments at hand. Financial institutions can lend money with rate of interest or buy bond. The market return describes the market which contains the asset and financial institutions can establish limits on the amount of credit to advance to a borrower or firm, diversifying the portfolio composition

eventually reducing the risk of credit loss hence achieving higher financial performance. In this regards, management of the financial institutions including SACCOs needs to seek ways of managing credit risks they are exposed to minimize on the credit loss and maximize on financial returns (Kabiru, 2002).

4.3 The Capital Buffer Theory of Capital Adequacy

Mwai (2017) the capital buffer theory of capital adequacy by Calem and Rob (1996) financial institutions will aim at holding more capital than the recommended statutory capital by adhering to policies that target the formation of sufficient mandatory capital intended to enhance reduction of economic fluctuations by way of lending to counteract fluctuations. The mandatory capital is surplus amount of banks capital held beyond the least regulatory fund. Therefore, this theory holds that financial institutions amid small buffer capital will endeavor to maintain their buffer capital as the more funds a bank holds the easier it will absorb the adverse shocks which will minimize the risks of failure. When the portfolio risks of banks goes up, banks will be forced to raise more capital in order to keep up their capital buffers which relates to the prudential regulation on capital adequacy.

5. Conceptual Framework

Figure 1: Conceptual Framework

6. Research Methodology

The study adopted descriptive research design. The target population for the study comprised of all the twenty eight commercial banks in Nakuru County as at 31st December 2017 (CBK Bank Supervision Annual Report, 2017). The target respondents consisted of twenty eight relationship managers of all the twenty eight commercial banks in Nakuru County. The study adopted census technique to select all twenty eight relationship managers who had full information about the variables of the study in all the twenty eight licensed commercial banks in Nakuru County. All twenty eight respondents were directly involved which represented one hundred percent of the targeted individuals. The study used both primary and secondary data on all the variables of the study. The study used structured questionnaires to collect primary data which were administered to each target member of the population. Primary data collection involved drop and pick method. The study secondary data was collected from the banking survey 2017 and central bank of Kenya annual supervisory reports. The primary and secondary data were prepared and analyzed through Statistical Package of Social Sciences to evaluate descriptive statistical analysis that generated frequency distribution tables and particular inferential statistics which included Pearson correlation analysis and regression analysis which were used to assess the association and relationship between the variables. Multiple regression analysis was conducted on each of the research question to test 95 percent level of significance of independent variables on dependent variable.

7. Research Results

Pearson correlation analysis was used to ascertain the relationship between dependent variable and the independent variables.

Table 1: Correlation between Dependent and Independent Variables

	Non-performing loans	Capital Adequacy	Asset Quality	Liquidity Management	Management Efficiency
Non-performing loans	1.0000				
Capital Adequacy	-0.1717 0.0000	1.0000			
Asset Quality	0.7459 0.0000	-0.0040 0.0000	1.0000		
Liquidity Management	-0.1321 0.0000	0.5033 0.0000	0.0023 0.0000	1.0000	
Management Efficiency	0.6898 0.0000	-0.0366 0.0000	0.7227 0.0000	-0.2616 0.0000	1.0000

*Significant at 0.05 level

The finding revealed that there exist a weak negative relationship between non-performing loans and capital adequacy ($r=-0.1717$; $p>0.05$). This implies that increase in capital adequacy increases non-performing loans. This study corroborates Malimi (2017) and concurs with Alexandri & Santoso (2015) who found that capital adequacy posed insignificant influence on NPLs. Moreover, there exist a strong positive statistically significant relationship between asset quality and NPLs ($r=0.7459$; $p<0.05$). This implies that increase in asset quality increases NPLs. This finding is

supported by Abata (2014), Anyike and Nwosi (2015) who found asset quality to be positively and significantly related to NPLs and bank's performance.

The results further show that there exist a weak negative insignificant relationship between liquidity management and NPLs ($r=-0.1321$; $p>0.05$). The finding is in line with Kinoti (2015) and concurs with Pop *et al* (2018), who note a statistically insignificant effect of NPLs on liquidity management. Finally, the study revealed that there exist a strong positive relationship between management efficiency and NPLs ($r=0.6898$; $p<0.05$). This implies that if banks increase management efficiency, NPLs decrease. These result is supported by Khan *et al* (2020) who reported that effective cost management reduces NPLs. Cajueiro *et al* (2011) found that incompetence is the major cause of rising trouble loans and Karim *et al* (2010) revealed that poor management results in bad quality loans which increase NPLs.

Multiple linear regressions were used to determine the effects of bank regulation on level of non-performing loans. Table 2 shows the model summary,

Table 2: Model Summary

Model	F	R ²	Adjusted R ²	Root MSE	No of observations
1	9.80	0.6301	0.5658	4.9039	28

Table 2 shows that the Adjusted R Square of the regression model is. 0.5658. This indicates that up to 56.58% of changes in nonperforming loans can be explained by changes in capital adequacy, asset quality, liquidity management and management efficiency. This leaves unexplained variation of 43.42% which could be explained by other factors outside the study variables. Table 3 presents ANOVA test. Table 3 shows the significance of the model which was tested at significance level of 0.05.

Table 3: ANOVA Test

Model	Sum of Squares	Df	Mean Square	F	Sig.
Model	942.292286	4	235.573072	9.80	0.0001
Residual	553.105152	23	24.0480501		
Total	1495.39744	27	55.3850903		

a. Dependent Variable: Nonperforming Loans

b. predictors: capital adequacy, asset quality, liquidity management and management efficiency

The F-test signifies whether linear regression model provides a better fit to the data than a model that contains no independent variables. The finding indicates that the model as a whole has statistically significant predictive capability; $F(4, 23) = 9.80$, $p < 0.05$.

Table 4: Regression Coefficients'

	Coefficients.	t-values	Std. Error	Sig.
Capital Adequacy	-0.2619	-1.20	.2182654	0.242
Asset Quality	0.1141	2.63	.043304	0.015
Liquidity Management	0.0356	0.26	.1359463	0.796
Management Efficiency	0.0997	1.62	.0616342	0.119
Constant	4.1013	0.70	5.880585	0.493

The results from the model in Table 4 show that asset quality significantly and positively influence the NPLs by 11.41% ($p < 0.05$). This implies that increase in asset quality increases NPLs by

11.41%. This finding is supported by Abata (2014) who found asset quality to be positively related to NPLs and bank's performance. This result is in line with Anyike and Nwosi (2015) who note that the regulatory authorities should regularly access the banking sector lending behavior to ensure compliance with banking rules and regulations to avoid increasing incidence of NPLs.

On the other hand, Kadioglu, Telceken and Ocal (2017) who found a negative significant association between profitability and NPLs determined by both return on equity and assets. Hence, higher NPLs lead to lower asset quality and on the other hand lower NPLs lead to high asset quality. On the contrary, Ozurumba (2016) and Nzoka (2015) found a negative relationship between financial performance and asset quality. The findings suggested that for high assets quality levels to be achieved, improved investments on assets levels and the low levels of Non-Performing Assets should be realized by controlling risks. During the study period commercial banks faced deterioration of the asset quality attributed by delay payments by public and private entities. Therefore, CBK should closely monitor banks with deteriorating asset quality. Management efficiency has a positively and statistically insignificant influence on NPLs by 9.97% ($p < 0.05$). This implies that if banks increase management efficiency, NPLs decrease by 9.97%. Macharia (2016) found a negative statistically insignificant relationship between management efficiency and NPLs who reported that effective cost management reduces NPLs. Karim *et al* (2010), Khan *et al* (2020) found a negative statistically significant relationship between management efficiency and NPLs thus poor management results in bad quality loans which increase NPLs. On the other hand, Cajueiro *et al* (2011), Louzis *et al* (2012) found a positive statistically significant relationship in that bad management with poor skills in credit scoring, appraisal of pledged collaterals and monitoring borrowers will positively impact to high NPLs.

Similarly, liquidity management exerts a positive statistically insignificant relationship on NPLs by 3.56% ($p < 0.05$). This implies that a unit increase liquidity risk exposure it increases NPLs by 3.56%. This finding is in line with Kinoti (2015) who note the statistically insignificant effect of NPLs on liquidity management and the size of loan portfolio which are expected due to the NPLs being above the acceptable threshold. When liquidity management is statistically insignificant on NPLs it portrays liquidity risk exposure thus NPLs should be monitored prudently to safeguard a sound liquidity position for the bank because NPLs indicate the presence of credit risk debtors which turn into a severe credit risk. During the period of study NPLs were in an upward trend which necessitates the severe effects of liquidity risk in the banking sector despite the banking sector maintaining statutory minimum ratios. Thus liquidity risk can be mitigated by decreasing the level of NPLs by banks; monitoring their long term debtor, CBK to closely monitor the banking sector credit risk on the risk classification. This finding concurs with Pop *et al* (2018) thus regulators should concentrate on less liquid banks as higher sensitivity of their NPLs enhances contribution to systemic risks. On the contrary, Awuor (2015) found a statistically significant positive relationship between liquidity management and level of non-performing loans. Vodora (2011) found a positive link between liquidity and level of NPLs. Finally, capital adequacy has a negative influence on NPLs by 26.2% ($p > 0.05$). This implies that a unit increase in capital adequacy will lead to 26.2% increase on non-performing loans. This result corroborates Malimi (2017) and Khan *et al* (2020) who found that capital adequacy posed insignificant influence on NPLs as banks had strong capital adequacy ratios more than statutory requirements, however, the banking segment was not able to meet the NPLs set thresholds. This result is in line with Alexandri & Santoso (2015) who note that prudence in lending will have a reduction in the urge for banks to take more risks. During the study period, the banking sector average capital adequacy ratio was

above the statutory regulation although the banking sector experienced high NPLs in economic sectors as trade, manufacturing, real estate and personal/ household. Thus CBK should closely monitor the four economic sectors and ensure that commercial banks give adequate provisions for the loans to mitigate risk of default

Multiple regression analysis was conducted to ascertain the moderating effect of macroeconomic factors on the relationship between bank regulation and level of NPLs. In interpretation and understanding the result of regression analysis, R squared was used to check how well the model fitted the data. The coefficient of determination, R^2 was used in this study as a useful tool because it gives the proportion of the variance of one variable that is predictable from the other variable. It is a measure that allows the determination of how certain variables can be in making predictions from a certain model.

Table 5: Regression Model for Moderating Effect of Macroeconomic Factors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.860 ^a	.740	.734	.26871

a. Predictors: (Constant), Macroeconomic Factors, Capital Adequacy, Asset Quality, Liquidity Management, Management Efficiency

Based on the results in Table 5, the R squared after incorporating the moderating variable which was macroeconomic factors was 0.7400 which was higher than the R squared before moderation by macroeconomic factors which had its R square being 0.6301. This means that macroeconomic factors have moderating effect on the relationship between bank regulation and level of NPLs in commercial banks in Nakuru County, Kenya and explains 74.00 percent of the variations in NPLs. Table 4.13 provides the analysis of the variance (ANOVA) results of the Macroeconomic Factors, Capital Adequacy, Asset Quality, Liquidity Management, Management Efficiency on level of NPLs in Nakuru County.

Table 6: ANOVA for Macroeconomic Factors, Bank Regulations, on NPLs

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	34.333	4	8.583	118.876	.000 ^b
	Residual	12.058	23	.072		
	Total	46.391	27			

a. Dependent Variable: Competitiveness

b. Predictors: (Constant), Macroeconomic Factors, Capital Adequacy, Asset Quality, Liquidity Management, Management Efficiency

The results in Table 6 indicate that the model was statistically significant. Further, the results imply that the Macroeconomic Factors, Capital Adequacy, Asset Quality, Liquidity Management, Management Efficiency are good predictors explaining the NPLs in commercial banks in Nakuru County. This was supported by an F-statistic of 118.876 and the reported p-value of 0.000 which was less than the conventional probability significance level of 0.05 implying that macroeconomic factors (GDP and inflation) have moderating effect on the relationship between bank regulations and NPLs. Regression of coefficient results after moderation with macroeconomic factors are presented in Table 7.

Table 7: Regression of Coefficients for Bank regulations, Macroeconomic Factors on NPLs

Model	Unstandardized Coefficients		Standardized T Coefficients		Sig.
	B	Std. Error	Beta		
(Constant)	-0.336	0.219		-1.537	0.126
Capital Adequacy*Macroeconomic Factors	0.313	0.062	0.303	5.061	0.027
Asset Quality*Macroeconomic Factors	0.153	0.072	0.13	2.115	0.036
Liquidity Management*Macroeconomic Factors	0.186	0.051	0.165	3.646	0.044
Management Efficiency*Macroeconomic Factors	0.455	0.045	0.483	10.204	0.038

a. Dependent Variable: NPLs

Results in Table 7 revealed that Capital Adequacy, Asset Quality, Liquidity Management and Management Efficiency were all positively and significantly related to NPLs after moderation with Macroeconomic Factors (GDP and Inflation). This implies that macroeconomic factors have moderating effect on the relationship between bank regulation and level of NPLs. The study period had an average inflation rate of 8.3% and GDP rate of 5.2% thus the high average inflation rate and slow growth of GDP has an impact on the study variables. With high inflation and slow GDP growth, banks will experience low deposits and customer deposits are the main source of funding to banks. Banks are responsive to inflation as bank managers are prone to manipulation which has an impact on management efficiency. High inflation and low GDP growth will have an impact on asset quality and liquidity management in that lower GDP growth reduces the economic activities and debtors' loan repaying capacity thus deteriorating the asset quality and enhancing liquidity risks.

8. Conclusion

Based on the regression results from first objective, the study concludes that there exist negative relationships between non-performing loans and capital adequacy, capital adequacy influence negatively on NPLs. This implies that a unit increase in capital adequacy will lead to 26.2% increase on non-performing loans. Thus, when a bank increases its capital, there is an increase in non-performing loans. Banks should undertake prudence in lending which will reduce the urge for banks to take more risks. As regards the findings of the second objective, the study concludes that there exist positive relationship between asset quality and NPLs, asset quality significantly and positively influences the NPLs. This implies that when banks increase its asset quality, it will enhance an increase in its level of NPLs, since inadequate bank's asset quality will amplify balance due losses plus spend additional funds when collecting NPLs. Relating to the findings of the third objective, the study concludes that there exist a negative statistically insignificant relationship between liquidity management and NPLs. This implies that increase in leverage and liquidity gap

negatively affects profitability of banks as NPLs indicate the presence of credit risk debtors which turn into a severe credit risk. Finally, the findings of the forth objective, the study concludes that there exist a positive statistically insignificant relationship between management efficiency and NPLs. This implies that if banks increase management efficiency, NPLs decrease. Hence, managers of banks should develop policies to ensure they reduce the level of NPLs and banks ought to efficiently manage their operating costs and expenses. The study further concludes that macroeconomic factors which in this case GDP and Inflation moderates the relationship between bank regulation and level of NPLs. This implies that macroeconomic factors are statistically significant to NPLs.

9. Recommendations

The study recommends that central bank of Kenya should regularly access lending behavior to ensure compliance with banking regulations to avoid increasing incidences of NPLs. Banks with high capital adequacy ratios tend to lend more thus increasing their exposure to liquidity risks which increases NPLs. The study also recommends that central bank of Kenya should closely monitor banks with deteriorating asset quality. Deterioration of banks asset quality was attributed to delayed payments by the public and private sector entities. The study further recommends that central bank of Kenya should strictly monitor the economic sector and ensure that banks provide adequate provisions for loans to mitigate risks of default. High inflation and slow GDP growth, banks will experience low deposits and customer deposits are the main source of funding to banks. Banks are responsive to inflation as bank managers are prone to manipulation which has an impact on management efficiency. The study further recommends that banks should maintain a good balance on deposits and lending out loans and adhere to regulators decisions about monetary policies. Banks increase in leverage and liquidity gap negatively affects profitability of banks as NPLs indicate the presence of credit risk debtors which turn into a severe credit risk. Finally, the study recommends that banks should increase the operational efficiency of operation weakness and improve corporate governance on the sanction of loans, thus, central bank of Kenya should focus on managerial performance in order to detect banks with potential increases in NPLs. Poor corporate governance leads to corruption in lending which facilitates increase in NPLs as loans are granted without considering the required thresholds.

References

- Abata, M. A. (2014). Asset Quality and Bank Performance: A Study of Commercial Banks in Nigeria. *Research Journal of Finance and Accounting*, 5(18), 39-44
- Agbomdakaw, A. E. (2010). *Financial Regulations, Risk Management and Value Creation in Financial Institutions: Evidence from Europe and USA*. University of Sussex: Unpublished Research Project.
- Alexandri, B. M., & Santoso, T. I. (2015). Non performing Loan: Impact of Internal and External Factor (Evidence in Indonesia). *Internal Journal of Humanities and Social Science Invention*, 4(1), 87-91.
- Anyike, L. L., & Nwosi, A. A. (2015). Asset Quality and Profitability of Commercial Banks: Evidence from Nigeria . *Research journal of Finance and Accounting* , 6(18), 26-32.
- Ariff, M., & Shawtari, F. A. (2019). Efficiency, asset quality and stability of the banking sector in Malaysia. *Malaysian Journal of Economic Studies*, 56(1), 107-137.
- Arrawatia, R., Dawar, V., Maitra, D., & Dash, S. R. (2019). Asset quality determinants of Indian banks: Empirical evidence and policy issues. *Journal of Public Affairs*, e1937.

- Awuor, F. (2015). *Effects of Selected Bank Specific Factors on Non Performing Loans Amongst Commercial Banks in Kenya*. University of Nairobi: Unpublished Research Project.
- Cajueiro, D. O., Craveiro, G. L., & Tabak, B. M. (2011). *Bank Efficiency and Default in Non Performing Loans in Brazil: Causality Tests*. Brazil: Working Papers Series 253 Banco Central Do Brasil.
- Demerjian, P. R., Owens, E. L., & Sokolowski, M. (2018). Lender Capital Adequacy and Financial Covenant Strictness. Available at SSRN 3240916.
- Hanson, S. G., Kashyap, A. K., & Stein, J. C. (2011). A Macroprudential Approach to Financial Regulation. *Journal of Economic Perspectives*(25), 3-28.
- Hartman-Glaser, B., Mayer, S., & Milbradt, K. (2019). Corporate Liquidity Management under Moral Hazard.
- Jimenez, G., & Saurina, J. (2006). Credit Cycles, Credit Risk, and Prudential Regulation. *International Journal of Central Banking*, 2(2), 65-95.
- Jumreornvong, S., Chakreyavanich, C., Treepongkaruna, S., & Jiraporn, P. (2018). Capital adequacy, deposit insurance, and the effect of their interaction on bank risk. *Journal of Risk and Financial Management*, 11(4), 79.
- Kabiru, J. M. (2002). *The Relationship between Credit Risk Assessment Practice and the Level of Non performing Loans in Kenyan Banks*. University of Nairobi: Unpublished Project.
- Kadioglu, E., Telceken, N., & Ocal, N. (2017). Effect of the Asset Quality on the Bank Profitability. *International Journal of Economics and Finance*, 9(7), 60-65.
- Karim, M. Z., Chan, S.-G., & Hassan, S. (2010). *Bank Efficiency and Non Performing Loans: Evidence from Malaysia and Singapore*. Malaysia and Singapore: Prague Economic Papers.
- Kassem, N. M., & Sakr, A. (2018). The Impact of Bank-Specific Characteristics on the Profitability of Commercial Banks in Egypt. *Journal of Finance*, 6(2), 76-90.
- Khan, M. A., Saddique, A., & Sarwar, Z. (2020). Determinants of Non performing Loans in the Banking Sector in Developing State. *Asian Journal of Accounting Research*, 135.
- Kinoti, Y. G. (Ed.). (2015). *The Effect of Non performing Loans on the Size of the Loan Portfolio in Commercial Banks in Kenya*. Nairobi: University of Nairobi Unpublished Project.
- Kumbhakar, S. C., Lozano-Vivas, A., KnoxLovell, C. A., & Htekhar, H. (1999). The Effects of Deregulation on the Performance of Financial Institutions: The Case of Spanish Savings Banks. *Journal of Money Credit and Banking*, 1(33), 1-5.
- Lintner, J. (1965). The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budget. *Review of Economics and Statistics*, 47(1), 13-37.
- Louzis, D. P., Vouldis, A. T., & Metaxas, V. L. (2012). Macroeconomic and bank specific determinants of non performing loans in Greece: a comparative study of mortgage, business and consumer loan portfolios. *Journal of Banking and Finance* , 36, 1012-1027.
- Macharia, J. N. (2016). *Determinants of Profitability of Commercial Banks in Kenya*. Nairobi: Unpublished Research Project.
- Malimi, K. (2017). The Influence of Capital Adequacy, Profitability and Loan Growth on Non Performing Loans: A Case of Tanzanian Banking Sector. *International Journal of Economics, Business and Management Studies* , 4 (1), 38-49.
- Markowitz, H. M. (1952). "Portfolio Selection". *Journal of Finance*, 7, 77-99.
- Mikiko. (2003). *Mounting NPLs Weigh Heavily on Bank Management, Stock Prices Continue to Fall*. Japan: Research Institute of Economy, Trade and Industry.

- Muriithi, J. W. (2014). *The Effect of Non Performing Loans on Liquidity Risk of Commercial Banks in Kenya*. University of Nairobi. Nairobi: Research Project.
- Mwai, E. N. (2017). *The Relationship Between Capital Adequacy Requirements and Financial Performance of Commercial Banks in Kenya*. Kenyatta University Nairobi: Unpublished Research Project.
- Mwongeli, J. A. (2016). *The Effect of Regulations on Financial Performance of Commercial Banks in Kenya*. Nairobi: Unpublished Thesis.
- Nigusse, E. (2018). *An Assessment of Credit Risk Management in Dashen Bank Share Company* (Doctoral dissertation, St. Mary's University)
- Njoroge, P. (2016). *Bank Supervision Annual Report*. Nairobi: Central Bank of Kenya.
- Njoroge, P. (2017). *Bank Supervision Annual Report*. Nairobi: Central Bank of Kenya.
- Njoroge, P. (July-September 2017). *Quarterly Economic Review*. Nairobi: Central Bank of Kenya.
- Nzoka, F. K. (2015). *The Effects of Assets Quality on the Financial Performance of Commercial Banks in Kenya*. Nairobi: Unpublished Research Project.
- Okello, S., Kirori, G. N., & Ndiao, S. O. (2019). Financial Performance of the Banking Sector in Kenya: The Role of Internal Audit. *Journal of Finance and Accounting*, 3(1), 29-50.
- Ombaba, M. K. (2013). Assessing the Factors Contributing to Non performing Loans in Kenyan
- Oxera. (2006). *A Framework for Assessing the Benefits of Financial Regulation*. UK: Financial Service Authority.
- Ozurumba, B. A. (2016). Impact of Non Performing Loans on the Performance of Selected Commercial Banks in Nigeria. *Research Journal of Finance and Accounting* , 7 (16), 95-109.
- Petkovski, M., Kjosevski, J., & Jovanovski, K. (2018). Empirical Panel Analysis of Non-Performing Loans in the Czech Republic. What are their Determinants and How Strong Is Their Impact on the Real Economy? *Finance a Uver: Czech Journal of Economics & Finance*, 68(5).
- Sharpe, W. F. (1964). Capital Asset Price: A Theory of Market Equilibrium Under Conditions of Risk.
- Sproul, & Micheal. (1998). The Quantity Theory verses the Real Bills Doctrine in Colonial America. *IMF Working Paper*.
- Tesfai, A. (2015). *Evaluating the Relationship Between Liquidity, Capital Adequacy and Non Performing Loans on Financial Performance: Case Study of Habib Bank AG Zurich*. Africa: United States International University
- Treynor, J. L. (1961). *Toward a Theory of Market Value of Risky Asset*. Unpublished Manuscript.
- Warue, B. N. (2013). The Effect of Bank Specific and Macroeconomic Factors on Non-performing Loans in Commercial Banks in Kenya: A Comparative Panel Data Analysis. *Advances in Management and Applied Economics*, 3(2), 135-164
- Vardar, G., & Ozguler, I. C. (2015). Short Term and Long Term Linkages among Non performing Loans, Macro Economic and Bank Specific Factors: An Empirical Analysis of Turkey. *Ege Academic Review*, 15(3), 313.
- Vodova, P. (2011). Liquidity of Czech Commercial Banks and its Determinants.

International Journal of Mathematical Models and Methods in Applied Sciences, 5(6), 1060-1067.

Witmer, J. (2019). Strategic complementarities and money market fund liquidity management. *Journal of Financial Intermediation*, 38, 58-68.

This is an open-access article published and distributed under the terms and conditions of

the [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/) of United States unless otherwise stated. Access, citation and distribution of this article is allowed with full recognition of the authors and the source. Authors seeking to publish with an Internationally Peer Reviewed Journals should consider <https://www.ijcab.org/> by writing to the Editor at editor@ijcab.org or submitting online at <https://journals.ijcab.org/journals/index.php>. The articles must be quality and meet originality test.