

Bank Specific Characteristics, Prudential Regulations and Non-Performing Loans of Commercial Banks Listed At Nairobi Securities Exchange, Kenya

Laban Kinyua Chege¹, Job Omagwa, PhD², Farida Abdul, PhD³

¹(MSc Finance student, Kenyatta University, Kenya:

²(School of Business, Department of Accounting & Finance, Kenyatta University, Kenya:

³(School of Business, Department of Accounting & Finance, Kenyatta University, Kenya:

Corresponding Author: Laban Kinyua Chege

Abstract: The Kenyan banking industry have in the recent past reported a high level of non-performing loans(NPLs). This development has had a negative impact in the industry with key stakeholders raising alarm over the deteriorating trend in the loan quality. The study sought to assess the relationship between bank specific characteristics, prudential regulations and non-performing loans among commercial banks listed at Nairobi Securities Exchange, Kenya. The specific objectives of the study were: to determine the relationship between bank size, credit size, lending rate, capital adequacy, liquidity and NPLs. Inflation was used as a moderating variable. The study collected secondary data of nine commercial banks between the period 2012 to 2017. Panel regression with fixed effects method was used for analyzing the collected data at 5% level of significance. The credit size and liquidity had a p-value of 0.04 and 0.045 respectively indicating a significant effect on the level of NPLs. Bank size, lending rate and capital adequacy ratio had p-value of 0.560, 0.10 and 0.982 respectively indicating an insignificant effect on the level of NPLs. Inflation, had a significant moderating effect on the relationship between bank specific characteristics and NPLs ($p=0.049$) and an insignificant moderating effect on the prudential regulations and NPLs ($p=0.263$). The study recommended investment in human resource assigned to the credit units to mirror the growth in credit size. The CBK should enhance its credit and liquidity regulation supervision. The regulator should also sensitize the lenders on the effect of inflation on their internal operations and also create a proactive regulatory environment to prevent factors that may lead to hikes in liquidity volume.

Key words: Bank specific characteristics, prudential guidelines, inflation, Non-Performing loans, Central Bank of Kenya, commercial banks and Nairobi Securities Exchange.

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I. Introduction and Background

The levels of Non-performing loans at global, regional and local levels have posed a major challenge to credit growth (KPMG, 2018). The World Bank (2018) stated the global average level of Non-Performing Loans in the year 2017 as 7.21%. Banks in the African region have continuously registered an increase in the level of Non-Performing Loans. Locally, the levels of Non-performing loans have been increasing. The increase in the level of Non-Performing loan have outpaced the increase in the loan book during the last six years (2012 to 2017) with the increase in Non-Performing loans and Credit size at 307% and 72.8% respectively (CBK,2017). Non-Performing loans pose the greatest risk to commercial banks given that interest earning forms the heart of revenues derivation of commercial banks (Karim et al., 2013) mainly because lending is the mainstay of commercial banks.

Bank size refers to the total valuation of the assets of a bank (Laeven, Ratnovski & Tong, 2014). Highly capitalized banks are expected to report low volume of NPLs and thinly capitalized banks to report a high percentage of NPLs. The bank size was measured as the total assets held by the commercial bank as indicated in the published annual statement of financial position. Credit size is the volume of loans disbursed and advanced to borrowers in a specific bank. The extension credit facilities in terms of structured loan products accounts for 50% to 70% of the total revenue generated by commercial banks (Karim et al., 2010). The credit size was measured as the volume of loans advanced to borrowers by a commercial bank as shown in the statement of financial position of a respective bank.

Lending rate refers to rental fees charged by the lender on the borrowed funds (Crowley, 2007). The banking institutions in Kenya price their loans in reference to the central bank rate (CBR). The central bank of Kenya sets the benchmark rate commonly referred to as Central Bank rate (CBR). Lending rates in financial

institutions significantly impact on the borrower's repayment ability (Walsh, 2010). The lending rate was measured using the weighted average interest rate charged by a commercial bank in a specific year and as stated in the annual audited report of the commercial bank. Capital adequacy is the proportion of a bank total capital to the risk weighted assets held by the bank. A banks' strength is assessed through the capital adequacy ratio which indicates the buffer threshold held by the bank against shocks to its operations (Okoye et al., 2017). Following the enactment of prudential guidelines in the year 2013, the commercial banks are required to attain a statutory minimum total capital to total risk weighted assets of 14.5%, core capital to total risk weighted assets of 10.5% and core capital to total deposits liabilities of 8% (CBK, Prudential guidelines, 2013). The capital adequacy of the commercial bank was measured using capital adequacy ratio indicated in the statement of financial position.

Liquidity explains the ability of a bank to meet its financial obligations both in the short term and long term as and when they fall due (Nyabate, 2013). A bank institution in Kenya is mandated to hold a minimum liquidity ratio of 20% (CBK, Prudential guidelines, 2013). The liquidity of the commercial bank was measured using liquidity ratio as indicated in the statement of financial position. Inflation is the depreciation or loss of value in the currency (Opuodho, 2014). The Inflation rate is used to indicate the level of inflation in an economy. With an increase in the general rise of goods and services, the purchasing power of the currency declines (Boyd & Champ, 2004). Inflation rate is derived from the consumer price index (CPI), as an annualized percentage change in the consumer price index across a given period of time, usually one calendar year. Globally, lending institutions such as commercial banks, employ inflation rate as a factor in determining their lending rates (Santoni, 1986).

Non-performing loans are loans which are due for payment but the payments against the loans have not been made (Karim et al., 2010). The issuing banks are not able to derive profits from interest earnings against defaulted loans. Defaulted loans have a negative impact to the banks where in addition to profit rationing, they pose liquidity constraints to the banking institutions. Additionally, non-performing loans also commonly referred to as bad loans, calls for loan provisions that equally lead to a shrinking profitability level for a commercial bank. Non-performing loans pose the greatest risk to commercial banks given that interest earning forms the heart of revenues derivation of commercial banks (Karim et al., 2013) mainly because lending is the mainstay of commercial banks.

II. Research Problem

Globally, the level of Non-Performing loans poses the greatest risk to the stability and going concern of the banking industry. Commercial banks derive 70% of their gross revenues from the loan book (Waweru & Kalani, 2009). Baboucek and Jancar (2005) contend that lending is the primary activity of the banks where rates charged on borrowed funds account for the main source of their revenues. The central bank of Kenya has reported a deteriorating nature of the loans held in the commercial banks with the level of Non-Performing loans registering an increase year to year. Between the year 2010 and 2017 the level of Non-Performing loans rose by 307%, equivalent to KES 182.5 B (CBK, Bank sector report, 2017). This is in comparison to a 72.8% increase in credit size and 105% in the bank size between the same periods as well as a change in the operational framework of commercial banks following the enactment of prudential banking guidelines on capital adequacy and liquidity levels of commercial banks (CBK, Bank sector report, 2013).

Previous studies on Non-Performing loans in the Kenyan banking sector focused on macroeconomic and microeconomic drivers of Non-Performing loans. Musau (2014) studied the causes of Non-Performing loans in Kenyan commercial banks. The study employed descriptive cross-sectional research design where inflation level, GDP, real interest rates, credit growth, capital adequacy and liquidity formed the independent variables. The Musau (2014) study found a positive and statistically significant relationship between inflation rate, real interest rates, bank size and liquidity and Non-Performing Loans. However, capital adequacy ratio (CAR) was found to have a negative but significant relationship with Non-Performing Loans.

Nasieku (2014) studied the causes of Non-Performing loans in Commercial Bank of Africa (Kenya). The Nasieku (2014) study reported a significant positive relationship between economic conditions and Non-Performing loans with gross domestic product (GDP) reported as the most influential economic condition on Non-Performing loans. Bank ownership was found to have a significant relationship with Non-Performing Loans owing to the quality of leadership at the Board of directors. The study also reported a significant relationship between loan monitoring techniques with Non-Performing Loans. Hence, in view of the gaps documented from the empirical evidence, this study sought to address the same by assessing the relationship between bank specific characteristics and prudential regulations in relations to Non-Performing Loans of commercial banks listed at Nairobi Securities Exchange, Kenya.

III. Objectives of the study

The specific objectives of the study were:

- i. To determine the relationship between bank size and Non-Performing Loans of commercial banks listed at Nairobi Securities Exchange, Kenya.
- ii. To determine the relationship between credit size and Non-Performing Loans of commercial banks listed at Nairobi Securities Exchange, Kenya.
- iii. To determine the relationship between lending rate and Non-Performing Loans of commercial banks listed at Nairobi Securities Exchange, Kenya.
- iv. To determine the relationship between capital adequacy regulation and Non-Performing Loans of commercial banks listed at Nairobi Securities Exchange, Kenya.
- v. To determine the relationship between liquidity regulation and Non-Performing Loans of commercial banks listed at Nairobi Securities Exchange, Kenya.
- vi. To determine the moderating effect of inflation on the relationship between Bank Specific Characteristics and Non-Performing Loans of commercial banks listed at Nairobi Securities Exchange, Kenya.
- vii. To determine the moderating effect of inflation on the relationship between Prudential Regulations and Non-Performing Loans of commercial banks listed at Nairobi Securities Exchange, Kenya.

***The study formulated null hypothesis for each specific objective and tested the same at 0.05 significance level.**

IV. Significance of the Study

The findings of this study will be of value to various players in the economic environment space.

The banking industry will find the findings valuable in understanding the impact of their internal policies to Non-Performing loans while the Central Bank the institution tasked with regulating commercial banks will find important insights on the relationship between prudential regulations and the quality of the loan book. The government will find the information valuable in accessing the effect of bank specific factors to the general economy and by acquainting themselves with the discussions and findings of this study, the policymakers will be able to implement effective fiscal policies concerning the banking industry and therefore prevent the occurrence of Non-Performing Loans in the economy. The academicians and researchers will find the study valuable in literature review while conducting further studies on Non-Performing Loans.

V. Review of the literature

This section presents theoretical and empirical review. The theoretical literature reviews the existing theories in the confines of NPLs. Empirical literature attempts to review the results of various studies undertaken by researchers on NPLs.

a) Theoretical review

This study considered the following theories: Asymmetric Information Theory, Agency Theory, Loanable Funds Theory and the Theory of Financial Intermediation. The asymmetric information theory was put forward by Akerlof (1970) through the research paper "The market for lemons". Spence (1973) through his paper on "Market signalling" and Stiglitz (1975) contributed to the development of the theory of asymmetric information. The information asymmetric theory in the banking sector is evidenced through the concepts of adverse selection and moral hazard. Through adverse selection, lenders lack capabilities of pricing risk on borrowers thereby imposing high borrowing rates that push away good borrowers while attracting uncreditworthy borrowers. Moral hazard is a consequence of adverse selection whereby after underwriting of the loan, borrower's objectivity of honouring the agreed terms is put in doubt by actions that are contrary to the set conditions (Munene, 2012).

Agency theory is attributed to Jensen and Meckling (1976). The agency theory examines the relationship between a principal whom the agency theory defines as the owner of business and an agent whom the agency theory defines as a representative of the principal in the business (Eisenhardt, 1989). Non-performing loans maybe a result of poor credit structures and lending policies which are implemented by the agents appointed by the principal (Louzis et al., 2011). The agents may purposely administer weak lending policies in order to grow the loan portfolio and book higher interest earnings.

Loanable funds theory was proposed by Wicksell (1898) who elaborated on the differences and relationship between the interest rate and inflation in the economy. Through the explanation of interest rate and inflation, loanable funds theory used two states of economy; an economy where no commodity credits nor loan exist and a credit economy. Loanable funds theory asserts that the demand for and supply of funds is a key determinant of the level of interest rates and therefore individuals who want to save are the source for loanable funds while entrepreneurs who seeks capital or funds for purchase of assets or investment forms the demand for loanable funds.

Theory of financial intermediation is founded on the premise of resource allocation. There are various proponents of the theory of financial intermediation. Mises (1912) described banking as the process of negotiation between credit granters and credit grantees while Gurley and Shaw (1960), noted that banks and other non-bank financial institutions play the role of financial intermediaries through the process of maturity transformation. Sealey and Lindley (1977) noted that financial intermediary involves borrowing of funds by deficit spending units from surplus spending units while Baltensperger (1980) observed that the major role of commercial banks in financial intermediation is risk transformation. Theory of financial intermediation examines financial institutions as drivers of maturity transformation, risk transfer and economic growth.

b) Empirical review

The study reviewed empirical literature with an objective of documenting research gaps. Numerous studies have been done on Non-performing loans. Awour (2015) sought to establish the relationship of bank specific factors on Non-Performing Loans of commercial banks in Kenya. The study adopted a cross sectional survey research design. The study found that bank size had a negative and significant relationship with Non-Performing Loans and also established that bank specific factors explained 15% of the variations in Non-Performing Loans in the commercial banking industry. A negative relationship between the bank size and NPLs indicated that a highly capitalized bank had adequate resources to control the level of NPLs.

Munialo (2014) studied the relationship between the average lending rates and Non-Performing Loans among Kenyan commercial banks for the period 2009 to 2014. The study adopted descriptive research and through multiple linear regression for analysis reported a no significant relationship between average lending rates and Non-Performing Loans. The study concluded that poor lending tendencies resulting from weak credit policies resulted to the high level of NPLs among commercial banks in Kenya. Similarly, Tireito (2012) studied average lending rates and NPLs in Kenyan commercial banks reported an insignificant relationship.

Nguyen (2014) sought to establish the relationship of bank specific factors on NPLs of Vietnam Banks. The study used panel regression model on analysing the relationship between credit size measured by the loans total to asset ratio (LTA), total assets and state ownership as bank specific factors and NPLs. Credit size was found to have a positive and significant relationship with NPLs. A positive association between credit size and NPLs indicates that as commercial banks increase their lending volumes, there is a high likelihood that the level of NPLs significantly increases. Similarly, Jimenez and Saurian (2006) in their study of the relationship between credit size and NPLs reported similar findings of a positive and significant relationship between credit size and NPLs.

Curak, Pepur and Poposki (2013) sought to establish the relationship between macroeconomic factors, bank specific factors and Non-Performing Loans among south European banking systems. The study employed panel regression model to examine the effect of bank specific factors and bank performance. The study found a negative and significant relationship between a bank size and bad loans, a similar finding with Nguyen (2014). Mwangi (2013) studied the effect of interest rate and interest rate derivatives on Non-Performing Loans among commercial banks listed at Nairobi securities exchange in the period 2009 to 2013. The study adopted descriptive research and through multiple regression analysis reported significant relationships between interest rate and Non-Performing Loans. The study found a negative but significant relationship between interest rate and Non-Performing Loans while the interest rate spread was reported to have a positive and significant relationship with Non-Performing Loans.

Djiogap and Ngomsa (2012) studied the impact of bank size, gross domestic product (GDP) growth rate, inflation rate and capital adequacy on NPLs. The study focused on six African countries where a fixed effect model was used to analyse the effect of these variables on NPLs. From the findings, the study concluded that capital adequacy ratio had a negative but significant impact on the level of NPLs which essentially justifies the existing observation in the financial markets where commercial banks with a good and stable capital adequacy ratio are able to withstand credit shocks due to their well-diversified portfolios.

Musau (2014) studied the causes of NPLs in Kenyan commercial banks. The study adopted a multiple regression model to determine the significant bank specific and macroeconomic factors affecting the NPLs. The study employed descriptive cross-sectional research design where capital adequacy, liquidity inflation level, GDP, real interest rates and credit growth, formed the independent variables. The Musau (2014) study found a positive and statistically significant relationship between NPLs and liquidity. However, capital adequacy ratio (CAR) was found to have a negative but significant relationship with NPLs. The study also concluded that 92.1% of variations on NPLs was attributed to changes in the inflation rate, GDP growth rate, the real interest rate, credit growth, capital adequacy and liquidity ratio.

Godlewski (2004) study sought to establish the effect of capital regulation on credit risk among commercial banks in the emerging markets and found that increased capital regulation lead to increased tendencies of risk taking as lenders try to remain profitable therefore leading to credit risk exposure. Bank capital regulation was found to have a negative but significant relationship with credit risk exposure. The

increased credit risk exposure often leads to a high proportion of NPLs in commercial banks. The study asserts that capital regulation has no disciplinary impression on the banking sector and that it leads to a costly operational behaviour of the banks resulting to inefficiencies and lack opacity in reporting.

VI. Methodology

This section discusses the research design, the target population and sampling technique, data analysis and data presentation. This study employed causal research in establishing the causal relationship between bank specific characteristics and prudential regulations with NPLs. The variables under study were quantitative and therefore required collection and analysis of the empirical data in order to establish the existing relationship between the study variables. The target population for this study were the commercial banks listed at the Nairobi stock exchange. A census of all the nine listed commercial banks at Nairobi Securities Exchange on or before the year 2011 was formed the population. In a census, all members of a population form the study (Murphy,2002). Panel regression analysis was adopted for analysing the panel data collected.

The data on bank size, credit size, prudential regulations and Non-Performing Loans were extracted from the statement of financial position of the respective commercial bank. The data on lending rates was extracted from audited and published annual report as the weighted effective lending rates. Bank size was measured as the natural logarithm of the assets as represented in the statement of financial position while credit size, commonly referred to as loan book, was measured as the natural logarithm of the total loan advances. The lending rate was measured as the average of an individual bank lending rates in a specific year while the capital adequacy and liquidity regulations were measured by capital adequacy ratio and liquidity ratio respectively. The study carried out descriptive analysis on the data collected and used Pearson correlation coefficient to establish the association and strength of the explanatory variables. Panel regression analysis method with fixed effects was adopted for analysing the panel data collected.

The empirical model is shown below.

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \varepsilon$$

Where:

Y_{it} = Non-Performing Loans for bank i at time t

β_0 = Constant

$\beta_1 - \beta_5$ =Coefficients.

X_{1it} =Bank size for bank i at time t

X_{2it} =Credit size for bank i at time t

X_{3it} = Lending rate for bank i at time t

X_{4it} = Capital adequacy regulation for bank i at time t

X_{5it} = Liquidity of bank i at time t

ε = Error term

The study adopted inflation as the moderator variable with the following moderator model on bank specific characteristics and NPLs used:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 M_t + \beta_3 X.M_{it} + \varepsilon$$

Where:

Y_{it} = Non-Performing Loans for bank i at time t

β_0 =Constant.

$\beta_1 - \beta_3$ = Coefficients.

X_j = Bank Specific Characteristics for bank i at time t.

M_t =Inflation rate at time t.

$X.M_{it}$ = Interaction of Bank Specific Characteristics and Inflation Rate for bank i at time t.

ε = Error term

while the moderator model on Prudential Regulations and NPLs was as follows:

$$Y_{it} = \beta_0 + \beta_1 X_j + \beta_2 M_t + \beta_3 X.M_{it} + \varepsilon$$

Where:

Y_{it} = Non-Performing Loans for bank i at time t

β_0 =Constant.

$\beta_1 - \beta_3$ = Coefficients.

X_{it} = Prudential regulations for bank i at time t.

M_t =Inflation rate at time t.

$X.M_{it}$ = Interaction of Prudential Regulations and Inflation Rate for bank i at time t.

ε = Error term

VII. Results and Findings

This section presents data analysis, presentation of the findings and interpretation of the findings. Through data analysis, the study conducted descriptive analysis and diagnostic tests on the data collected.

a) Descriptive statistics

The study carried out descriptive analysis of the variables under study.

Table 1: Descriptive statistics

Variable	Mean	Median	Standard Deviation
Bank Size	213.69*	219.9*	1.52%
Credit Size	125.48*	132.9*	1.62%
Lending rate	14.00%	14.23%	1.97%
Capital Adequacy Ratio	19.09%	18.52%	6.38%
Liquidity Ratio	39.63%	39.36%	9.07%
NPLs	8.54*	7.32*	1.86%
Inflation	5.87%	6.19%	1.76%

The mean of the bank size indicated that the commercial banks under study had a relatively strong asset position. The difference between the median of the bank size and the average bank size was found to be relatively small thereby eliminating the possibility of extreme outliers across the observations. The standard deviation across the bank size of the study variables was relatively small indicating that there were no major differences observed in bank size across the observations.

The average credit size across the commercial banks under study indicated that the banks were actively growing their loan books across the study period with only a slower growth registered from 2016. The median and the average credit size differed by a small margin indicating that there were no extreme outliers across the observations. The standard deviation across the credit size of the study variables was relatively small. The average lending rate across the commercial banks during the study period was relatively low. However, the rates were relatively low in the year 2016 and 2017 in comparison to the other years under study. The standard deviation of the lending rate was also found to be relatively small.

The average capital adequacy ratio (CAR) across the study period attained the set prudential threshold of 14.5% while the standard deviation of capital adequacy ratio was relatively high across the observations. The commercial banks under study had a strong liquidity position as indicated by the average Liquidity Ratio which has attained the set prudential threshold of 20%. Although the average and median values of liquidity ratio had a small difference, the standard deviation of the data collected on liquidity ratio was significantly large thereby indicating a possibility of outliers across the observations. The average Non-Performing Loans during the study period was lower than the industry average of 11%. The median and the average Non-Performing Loans differed by a small margin while the standard deviation of Non-Performing Loans across the study period was relatively small.

b) Diagnostic Test Results

The study carried out diagnostic tests on the data collected. A Jarque-Bera test on the data collected failed to reject the null hypothesis that the data came from a normal population. A VIF test for multicollinearity concluded that Credit size and bank size were highly correlated while moderate correlation was reported among the lending rate, capital adequacy ratio and the liquidity ratio. The Breusch Pagan Test on the error terms confirmed presence of heteroscedasticity while the Durbin Watson test on error terms reported the absence of first order correlation. The Augmented dickey fuller test was used to examine concluded that all the variables lacked unit root.

c) Inferential analysis

The study carried correlation analysis to determine the nature of association and strength of the relationship of the explanatory variables. Panel regression method was used for data analysis in identifying the suitable model on the relationship between Bank Specific Characteristics, Prudential Regulations and Non-Performing Loans.

Table 2: Pearson Correlation

Variable	Bank Size	Credit Size	Lending Rate	Capital Adequacy Ratio	Liquidity Ratio
Bank Size	1.0000				
Credit Size	0.9448	1.0000			
Lending Rate	-0.1701	-0.0948	1.0000		
Capital Adequacy Ratio	0.1248	0.1844	0.1406	1.0000	
Liquidity Ratio	0.0072	-0.1519	-0.3725	0.1622	1.0000

Using Pearson correlation coefficient, the study reported a positive and strong relationship between bank size and credit size ($r= 0.9448$). A negative and very weak correlation was also found ($r=-0.1701$) between bank size and the lending rate. The bank size was also found to have a positive but weak relationship with capital adequacy ratio and liquidity ratio ($r= 0.1248$). The credit size was found to have a negative and very weak relationship with liquidity ratio ($r= -0.1519$) and lending rate ($r= -0.0948$) respectively. However, credit size was found to have a positive and very weak relationship ($r= 0.1844$) with capital adequacy ratio. The lending rate and capital adequacy ratio reported a positive and very weak relationship ($r= 0.1406$).

Table 3: Hausman Test

The study used the panel method for regression analysis on the data collected. Through the Hausman test the study employed panel regression with fixed effects for analysis.

Variable	Coefficients			sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re	(b-B) Difference	
Bank Size	.1903088	1.086896	-.8965871	.
Credit Size	1.552581	.0307774	1.521804	.
Lending Rate	-4.370913	-3.427903	-.9430096	.376302
Capital Adequacy Ratio	-.0389926	-2.989432	2.950439	.
Liquidity Ratio	1.14571	-.4766193	1.622329	.
Prob>chi2 = 0.0000 (V_b-V_B is not positive definite)				

The Hausman test reported a p-value of 0.0000 indicating that it was statistically significant at 5% significance level. The null hypothesis of the Hausman test was rejected and the study concluded that the fixed effect model was preferred to random effect model. The fixed effect model was used to regress Non-Performing loans with the explanatory variables.

Table 4: Fixed effect regression analysis

Panel regression method with fixed effects regress NPLs with the explanatory variables

Variable	Coefficient	Standard Error	T	P> t
Bank Size	0.1903088	0.3127111	0.61	0.560
Credit Size	1.552581*	0.391968	3.96	0.004
Lending Rate	-4.370913	1.300015	-3.36	0.010
Capital Adequacy Ratio	-0.0389926	1.640548	-0.02	0.982
Liquidity Ratio	1.14571*	.5369497	2.13	0.045
Constant	-9.352804	5.024525	-1.86	0.100
(*) indicate 5% significance level.				

Credit size and liquidity ratio were found to have a positive and significant relationship with Non-Performing Loans. The regression results established an insignificant relationship between bank size, lending rate, capital adequacy ratio and Non-Performing Loans. Inflation was found to have a significant moderating effect on the relationship between bank specific characteristics and Non-Performing loans. However, it was found to have an insignificant moderating effect on the relationship between prudential regulations and Non-Performing Loans.

The findings of this study were found to be consistent with Hisham, Ilyas AND Rehaman (2014) who found that the size of the loan book had a significant and positive relationship with the Non-Performing Loans in Pakistan banking sector. Mwangi (2013) study also reported a negative and significant relationship between lending rates and Non-Performing Loans among forty-three (43) commercial banks in Kenya. Gavalas and Theodore (2013) also reported a negative and significant relationship between lending rates and Non-Performing Loans and concluded that an increase in the lending rates may deter borrowers and consequently lead to a decline in the amount of loans advanced and eventually a relatively low credit risk exposure on the portfolio. Liquidity ratio and Non-Performing Loans were found to have a positive and significant relationship with similar findings reported by Okoye, Ikechukwu and Nzewe (2017) study on the effect of capital adequacy on the financial performance of commercial banks in Nigeria. Bank size was found to have positive and insignificant relationship with Non-Performing Loans consistent with the findings of Rajha (2016) who reported that bank size was insignificant in explaining the trends in Non-Performing loans among Jordanian commercial banks. The results of this study on capital adequacy were found to be consistent with the findings of Malimi (2017) who reported that capital adequacy ratio had no significant influence on the levels of Non-Performing loans in Tanzania banking sector.

Table 5: Moderating Effect Model 1

The results of the moderating effect model on the relationship between Bank Specific Characteristics and Non-Performing Loans are as shown below:

Variable	Coefficient	Standard Error	t	P> t
Bank Specific Characteristics	3.426742*	.4848499	7.07	0.000
Inflation	14.6023	8.649397	1.69	0.130
Interaction between Bank Specific Characteristics and Inflation	-2.053364*	.945489	-2.17	0.049
Constant	-15.84855*	3.637319	-4.36	0.002

(*) indicate 5% significance level.

The moderating effect model reported a moderating interaction effect coefficient between bank specific characteristics and inflation of -2.053364 with a P-value of 0.049 implying it was significant 5% significance levels. The moderating effect model reported a F-statistic of 23.72 with a P-value of 0.0002 therefore found significant at 5% significance level.

Table 6: Moderating Effect Model 2

The results of the moderating effect model on the relationship between Prudential Regulations and Non-Performing Loans are as shown below:

Variable	Coefficient	Standard Error	t	P> t
Prudential Regulations	2.298486	2.360753	0.97	0.359
Inflation	12.10429*	5.226383	2.32	0.049
Interaction between Prudential Regulations and Inflation	-20.7222	17.22763	-1.20	0.263
Constant	8.825944*	.7671797	11.50	0.000

(*) indicate 5% significance level.

The moderating results reported a negative and insignificant interaction coefficient of 20.7222 with a P-value of 0.263 between prudential regulations and inflation

VIII. Summary of key findings

The study found a positive and significant relationship between credit size, liquidity ratio and NPLs. However, bank size, lending rate and capital adequacy regulation were found to have an insignificant relationship with NPLs. The relationship between bank size and NPLs was found to be positive. A negative relationship was reported between capital adequacy regulation, lending rate and NPLs. Inflation was found to have a significant moderating effect on the relationship between bank specific characteristics and NPLs while its moderating effect on the relationship between prudential regulations and NPLs was found to be insignificant.

IX. Conclusions and Recommendations

Several conclusions are derived from the study findings. We conclude that the size of a commercial bank did not determine the volume of non-performing loans and vice versa. Also, an insignificant relationship between the bank size and Non-Performing Loans indicated that the size of assets at disposal of a commercial bank do not necessarily lead to a quality loan portfolio. The study further concluded that when the quantity of loans advanced to borrowers by a commercial bank increase, there is a possibility that the level of Non-performing will consequently rise. The proportion of bad loans would increase if similar terms and conditions, and credit underwriting procedures remained unchanged. Further, the study concluded that during a period of high interest rates borrowers avoided credit facilities from commercial banks with such reduced uptake of loans consequently reducing the credit risk exposure of a commercial bank loan. Additionally, the study concluded that favourable capital threshold as defined in Basel 111 and CBK prudential Regulations may not mitigate credit risk exposure to a commercial bank. A positive relationship between liquidity ratio and non-performing loans indicated that commercial banks were wary of high levels of liquidity in that if stricter lending policies were not adopted, such liquid liabilities would end up creating a higher volume of non-performing assets.

Several recommendations were made based on the study findings. Commercial banks are required to put in place adequate measures for controlling credit risk as they should anticipate a rise in the level of Non-Performing Loans with an increase in the credit size. Such measures should address the lending policies, the credit monitoring tools and the recovery tools. The lenders should employ high lending rate as a tool to avoid underwriting sub-standard loans. However, they should strive to have a proper balance between return and risk appetite. Additionally, the commercial banks should observe their liquidity levels and avoid reckless lending practices since such procedures would lead to sub-standard loans which would be characterised by poor repayment behaviour and eventually ending up to be non-performing assets.

The CBK should create awareness to the commercial banks about the significance of liquidity levels to the Non-Performing Loans and offer a high regulation threshold that mitigates poor lending practices. The regulator should also sensitize the lenders on the effect of Inflation on their internal operations that consequently influence the level of Non-Performing Loans in respective commercial banks. Although the NPLs increased in the year 2015-2017, this was unexpected as the amendment of the Banking Act established capping of the lending rate. It is expected that a decline in the lending rate would have a direct positive effect on NPLs. However, during the period, there were several events which may have led to the increase of NPLs for example the collapse of the Imperial Bank and placement of the Chase bank under receivership which reduced the liquidity available and consequently a credit squeeze. The government and CBK should create a proactive regulatory environment to avoid hikes in liquidity volume.

X. Contributions to Knowledge

The findings of this study will make an important contribution to the existing literature on bank specific characteristics, prudential regulations and non-performing loans. The major contribution of this study is that bank specific characteristics (credit size and lending rate) have a significant relationship with non-performing loans. Additionally, the study also makes an important contribution on prudential regulations by concluding that liquidity ratio has a significant relationship with non-performing loans. The study further established that inflation has a significant moderating effect on the relationship between bank specific characteristics and non-performing loans. The findings of this study will be useful to the banking industry. It shall inform them on the significance of respective banking characteristics to their overall Non-Performing Loans position. The commercial banks will also find out the importance of prudential compliance and the consequently effect on the level of Non-Performing loans they report. The commercial bank regulator will find the results key in their overall regulatory role while other researchers will find the study interactive while offering guidelines to their research.

XI. Areas for further research

The study found out that bank size had an insignificant relationship with NPLs. Further studies should examine the relationship of Bank size and NPLs by using a different measure of bank size other than the total assets listed in the statement of financial position. Capital adequacy ratio was also found to have an insignificant relationship with NPLs. Hence further research on capital adequacy ratio could utilize a wider time scope and sample size.

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