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Research Paper

Lending Behavior and Non -Performing Loans of Commercial Banks in Kenya.

Fridah Wayua Mulwa
Kenyatta University, School of Business, Department of Accounting and Finance

ABSTRACT
Kenyan commercial banks are a crucial finance pillar in the economy because they grant loans to businesses and individuals facilitate growth of businesses and investments. However, commercial banks in Kenya face a huge drawback with Non-performing loans because for the past five years Non-Performing loans have doubled from 5.6% to 12.7% and in the first quarter of 2019 non-performing loans had increased by 27.5 billion Kenyan shillings which is an increase of 8.7% with NPLs of 345 Billion Kenyan Shillings. Several research studies have been conducted on NPLs of commercial banks in Kenya however, none of them considered using competition as moderation variable for their studies. Therefore, there was a literature gap and to address it this research study investigated the effect of lending behavior and non-performing loans of commercial banks in Kenya. The study adopted causal research design; census sampling was used to conduct a study on the 38 commercial banks that had been on consistent operation from 2014-2018. For this study secondary data from the audited financial statements of commercial banks in Kenya from their official websites and from the Central Bank of Kenya annual bank supervision reports was be used. The findings were that; loan growth has a positive insignificant effect on NPLs of Kenyan commercial banks from the findings of the research study. Secondly, from the findings of the study lending rate has a negative but significant effect on NPLs of the Kenyan commercial banks. Thirdly loan portfolio diversification resulted to a negative significant effect on NPLs of commercial banks in Kenya. Further the research study provided evidence that liquidity level has an insignificant negative effect on NPLs of the Kenyan commercial banks. Furthermore, findings of the research study show that bank size has a positive significant effect on NPLs of the Kenyan commercial banks. Lastly, competition has a significant moderation effect on NPLs of the Kenyan commercial banks. The study recommends that banks should provide a wide range of loan products and the Central Bank of Kenya should increase the minimum capital requirement to promote mergers and acquisitions since the banking sector is already overbanked.

KEYWORDS: *Lending Behavior, Non-Performing Loans, Bank Size, Loan Portfolio Diversification, Loan Growth, Lending Rate, Competition*

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I. INTRODUCTION

1.1 Background of the study

Commercial banks grant loans to individuals, business firms and the government on short, medium- or long-term basis to facilitate development and investment activities, which contribute towards economic growth of a country (Alshatti,2015). There are several factors that influence commercial banks decision to lend loan to their borrowers taking into consideration factors like their volume of deposits, prevailing interest rates, banks liquidity ratio and their level of foreign and domestic investments (Chantapong, 2005). Brown and Zehnder (2006), argue that commercial banks give loans to customers in guidance to the principles that guide their operations such as profitability, solvency and liquidity.

Credit is the main income generating asset in most banks' portfolio, one of the reasons why commercial banks spent their resources to evaluate their credit quality (Nwankwo,2000). However, the economic crisis in 2007 saw the global banking industry experience an increase in the growth of bad debts, and in 2013, 8 percent of the total amount of loans extended to the euro area were non-performing, however they were not uniform in all countries 2 percent was in the Nordic region and 60 percent in Greece and Cyprus. And by the year 2015 NPLs were a major challenge in the Euro banking sector (Aiyar *et al*, 2015 and Grodzicki- *et al*, 2015). According to Sontakke and Tiwari (2013), NPLs are the biggest problem to the banking industry

across the globe because they reduce the expected interest income of commercial banks thus affecting their net income and their profits. NPLs are due to failure by the commercial banks to put in place strong monitoring and supervision controls, weak legal infrastructure and poor debt recovery strategies (Adhikary,2006).

According to Fofac (2005), interest rates have been a major determinant of loan reimbursement in the sub-Saharan African nations, also there is a close relation between NPLs and the macroeconomic elements which are not diversified in some African economies.

UNDP report (2005), noted that the Kenyan banking sector is full is loan portfolios that are poor and evaluated that 36% of the total given loans which are performing meaning that NPLs make up 64%. According to the Central Bank of Kenya (2018), the Kenyan commercial banks have experienced an immense rise in NPLs as they have doubled for the past 5 years with 5.6 percent of NPLs ratio in 2014 to 12.7 percent in 2018.

Majority of banks in Kenya fail due to poor management of lending by the staff who fail to analyze their borrower's information and quick loan approvals. Karanja (2009), argued that larger local banks, failures are due to poor analyzed lending where it is hard to establish net income from asset loaned out therefore affecting the net assets of the banks. Therefore, it's necessary to carry a study on lending behavior and non-performing loans of commercial banks in Kenya.

II. LITERATURE REVIEW

This section describes the theories of the study that is the financial intermediation theory, theory of information asymmetry, Credit Rationing Theory, liquidity preference theory and learning theory and also the empirical literature of the study.

Theoretical Review

Financial Intermediation Theory: The theory of financial intermediation was proposed by Diamond (1984), to explain the importance of technology in the movement of finances in an organization. According to this theory financial intermediation is depositing of funds by surplus units to financial institutions who lend it to deficit units. The existence of financial intermediaries helps to minimize the awareness and costs of transactions which come up from an information asymmetry between the financial lending institutions and their customers. Presence of intermediaries provides a continuous flow of funds from excess units to units which are in deficit therefore, they are able to fulfil the brokerage function because they combine users and providers of capital without altering the claim.

This theory stresses on the information that the bank has about, the borrower before granting them a loan (Bisignano,1992). According to Kibe (2003), banks break down assets into small units thus reducing the costs of transaction and also employ diversification to ensure that the welfare of equity holders and their customers is maintained.

Theory of information Asymmetry: This theory was developed by Akerlof (1970|), further by Stiglitz and Weiss (1981), whereby they defined information asymmetries as the unequal share of information that is accessible to businesses looking for capital and suppliers of the capital are presumed to have more informational advantage as opposed to the insiders of the businesses. Asymmetric information in the financial market can be either in the form of moral hazard and adverse selection. According to Auronen (2003), this theory states that's it's difficult to differentiate between borrowers who are likely to default payment or not therefore there is a problem of moral hazard, which states that there is an option for a borrower to fail to pay their loaned amount unless there is a future implication for the default, and in the financial market if the borrower is more informed on the loan item they are likely to negotiate favorable terms as opposed to the lender. According to Richard (2011), adverse selection is when a lender is not able to differentiate between projects that are have a higher credit risk and will end up making either a correct or wrong decision concerning the transaction. This theory explains that lenders face a challenge when determining the amount of wealth that the borrower will have accumulated by the time the loan will be repaid Therefore, accumulation of NPLs in commercial banks has been due to the presence of moral hazards. According to Abor (2005), a finance gap occurs mainly due to information asymmetries between financial service providers and the borrower

According to Barron and Staten (2008), it is possible individuals and persons with a negative loan repayment history to get new loans because they are ready to be charged interest rates, therefore, reducing the income of the bank.in such a situation banks are most likely to take low financing costs and deny interest advances, as opposed to higher loan fees and meet the greater part of the borrowers interest for loans.

Credit Rationing Theory: The theory credit rationing was proposed by Freiner and Gordon (1965), and later the theory was advanced by (Stiglitz and Weiss, 1981). According to this theory lenders base the prevailing interest rates on available collateral to control the amount of credit to give to borrowers. The decision to lend money to borrowers is also determined by the surety presented by the borrowers therefore, to reduce riskier investments and increase chances of the borrower to fulfil their credit obligation as lenders give loans at low interest rates. According to this theory borrowers will have an avenue to default loan payments when other

alternatives to collateral are used as collateral by borrowers for loans since their relation is not close with the lender as when collateral is involved.

Credit Rationing theory is important for the study because it explains how the dependent variable that is NPLs and independent variable that is lending rate influences how borrowers will default loan payments when the lenders in this case commercial banks charge high rates to invest in risky investment projects without collateral leading to an increase in NPLs.

The Liquidity Preference Theory: This theory of liquidity preference was proposed by Keynes (1936), to show various reasons why financial institutions desire to have to hold or invest liquid assets which can be demanded by investors at any time. According to Keynes the demand for money takes three forms that is speculative, precautionary and transactionary motive (Tily,2006). According to Asensio (2017), precautionary motive is holding money for unforeseen contingences, transactionary motive is based on demand for money to run current transactions for business and speculative motive is holding resources in form of liquidity awaiting interest changes or bond prices. Interest rates vary with the length or maturity of loans therefore, this theory is used to determine the optimal cash balance in a firm. If an organization uses speculative motive for its money demand it will not be able to have a balanced cash account in an unstable economy (Turyahebwa *et al*, 2013). The theory is important for this study because it explains the independent variable on liquidity level because it explains the motives commercial banks can always use to maintain a balance in their cash accounts.

The Learning Theory: This theory was developed by Jovanovic (1982), which was a different approach to firm growth which was called the 'noisy selection' model. In this theory firms in a small, perfectly competitive industry have various sizes as they learn at rates which are varying, about the real efficiency over time (firm, age variable). According to the theory firms are less aware of their real efficiency and most of the time decide on their level of output on the based on their costs in order to maximize their profits. Firms normally adjust their decisions on their level of output in accordance to their true cost once they get in to a new market and become more informed over time about their real capabilities according to how well they perform in the real business world.

The theory introduced the time element that is age and explained how firms reach a point when they are diminishing in returns to and decreasing probability that aging firm achieves. Through his reasoning one expects that experience new firms grow steadily than the older firms because of uncertainty of the real cost efficiency. According to Cressy (1999), the Jovanovic model holds that the only way to learn about real efficiency is to enter into business. This model is useful in explaining the firm growth pattern.

Empirical Literature Kingu *et al* (2018), conducted a study on the determinants of non-performing loans a case study of commercial banks in Tanzania, to determine the effect of loan growth on NPLs. The study used the causality research design and used descriptive analysis, using secondary data of 16 out of the 36 commercial banks in Tanzania. From the study findings a rise in loan growth did not have an increase in NPLs. However, this finding is yet to be confirmed in the Kenyan commercial banks with competition as a moderating variable.

Seema (2017), carried a research study on the determinants of NPLs in Nepalese commercial banks. The study was conducted on 26 commercial banks out of 36 in Nepal using secondary data from published documents of various commercial banks and Nepal Rastra Bank. Panel regression analysis model was employed to analyze data. The research study findings indicated that there exists a negative relationship between loan growth and NPLs. However, this study needs to be conducted to confirm the findings with a dynamic panel regression model and competition will be used as a moderating variable.

Obuya and Olweny (2017), carried a study on lending behavior loan losses from listed commercial banks in Kenya, and used panel regression analysis. Secondary data used was from the annual supervision reports and the audited financial statements from the Central Bank of Kenya. The findings of the study were; loan growth has a negative statistically insignificant effect on loan losses. However, this study will use competition as a moderating variable.

Mensah and Adjei (2015), carried a research study on the determinants of non-performing loans in the Ghana banking industry. Secondary data from 12 commercial banks from the central bank of Ghana was used. The study used panel regression model for data analysis. From the study loan growth has a negative effect on NPLs. However, these findings need to be confirmed in Kenyan commercial banks with competition as a moderating variable.

Pakhchanyan and Sahakyan (2014), conducted a research on the impact of abnormal loan growth on the banks solvency, profitability, and stability of the Armenian banking sector. The research study used secondary data from Armenian banks websites from 2003-2014. The GMM technique was to run panel data of 22 commercial banks. The findings of the study were loan growth has appositive effect on loan losses. However, this study findings are yet to be confirmed in the Kenyan commercial banks with competition as a moderating variable.

Laxmi, Ram and Wang (2017), carried a research study on macro-economic &bank specific determinants of NPLs in Nepalese banking system. 30 commercial banks were sampled for the study, secondary data from Nepal Rostra Bank (NRB) supervision reports annual audited reports of commercial banks in Nepal

and the Economic Bulletin. Panel regression model was used to analyze data. The research study findings were that liquidity has a negative effect on NPLs of the Nepalese banking system. However, this finding is yet to be confirmed in Kenyan commercial banks with competition as a moderating variable.

Subhi (2016), carried a study on determinants of NPLs in the Jordanian banking sector. The study used secondary data from the bank's annual financial reports, central bank of Jordan and the association of banks in Jordan. The study employed panel regression analysis for 12 commercial banks that were sampled. The study findings were that liquidity has a significant positive relation with NPLs. However, these findings are yet to be confirmed with the Kenyan commercial banks and competition will be used as a moderating variable.

Awour (2015), conducted a study on effects of selected bank specific factors on NPLs amongst Kenyan commercial banks. Secondary data was used for this study on 43 Kenyan commercial banks, with cross sectional research design for the study. The study used linear regression model and used SPSS for analysis. From the finding's liquidity has a statistically positive relationship with NPLs of the Kenyan commercial. However, for this study the researcher will employ causal research design and a dynamic panel regression model will be used

Nyaliet (2017), conducted a study on the factors affecting NPLs a case study of Kenyan Commercial Bank. Secondary data was used for the research study from the audited financial statements. The findings of the research study showed that bank size has a statistically insignificant relationship with non-performing loans. However, it is important to confirm these findings and with competition as moderating variable.

Laxmi, Ram and Wang (2017), carried a research study on macro-economic &bank specific determinants of NPLs in Nepalese banking system. 30 commercial banks were sampled for the study, secondary data from Nepal Rastra Bank (NRB) supervision reports annual audited reports of commercial banks in Nepal and the Economic Bulletin. Panel regression model was used to analyze data. The research study findings were bank size had a significant positive effect on NPLs this is because large banks take excessive credit risks. However, these findings are yet to be confirmed among the Kenyan commercial banks and competition will be used as moderating variable.

Mensah and Adjei (2015), carried a research on the determinants of NPLs in the Ghana banking industry. Secondary data from 12 commercial banks from the central bank of Ghana was used. Panel regression analysis model was used to analyze the data. The findings from the research study indicated that bank size has a positive effect on NPLs meaning that an increase in bank size leads to an increase in NPLs. However, the above research study is to be confirmed among the Kenyan commercial banks with competition as a moderating variable.

Obuya and Olweny (2017), carried a research study on lending behavior loan losses from listed commercial banks in Kenya, and used panel regression model was used for data analysis. Secondary data was used from audited financial statements and the Central Bank of Kenya. From the study findings loan portfolio diversification has a statistically insignificant negative effect on loan losses. However, the study will include all the Kenyan commercial banks and competition will be used as a moderating variable.

Komla, Anthony and Lydia (2017), conducted a research study on the effects of loan portfolio diversification on banks risks and returns. This study was based on 30 commercial banks from Ghana using secondary data from the banking supervision department of Ghana and individual banks annual reports. Panel regression analysis model was used for the data analysis. From the study findings loan portfolio diversification had a significant negative effect on bank risks that is NPLs and loan loss provisions. However, this study will use competition as a moderating variable to study 40 commercial banks in Kenya.

Abdioglu & Aytekin (2016), conducted a study on the factors that affect Non-Performing Loans ratio of deposit taking banks. Secondary data from the deposit taking banks was used for the study from the commercial bank's websites. The study used dynamic panel regression for analysis. The findings of the study were that ratio loan portfolio diversification had a positive effect on NPLs. Furthermore, the research study did not use competition as a moderating variable.

Ozan and Bolat (2016), carried a study on the determinants of NPLs of deposit taking banks in turkey. They study sampled 20 deposit taking banks in turkey using annual financial data from the Turkish Banking Association. The study employed panel regression for data analysis. From the finding's revenue diversification has a negative and significant effect on non-performing loans. However, this study findings are yet to be confirmed in commercial banks in Kenya with competition as a moderating variable.

Obuya and Olweny (2017), carried a study on lending behavior loan losses from listed commercial banks in Kenya, and used panel regression model for data analysis. The study used audited financial statements as their secondary data. The findings were lending rate has a statistically positive but insignificant effect on the loan losses of 11 commercial banks in Kenya. The insignificant effect is because the 11 listed commercial banks are in tier1 meaning that the commercial banks have well trained credit management teams that grant loans to borrowers who are financially stable with a high chance of loan repayment. However, this study will use competition as a moderating variable for this study.

Gadise (2014), conducted a study on the determinants of Non-Performing loans of commercial banks in Ethiopia using a sample of 8 banks out of the 19 commercial banks in Ethiopia. Secondary data from the Ethiopian National Bank and audited annual statements from banks was used. Panel data was employed for data analysis. The findings were lending rate has a negative impact on NPLs of commercial banks in Ethiopia. However, the above study findings are yet to be confirmed among Kenyan commercial banks and will use competition as a moderating variable.

Mwangi (2014), carried a research study on interest rates and non-performing loans of commercial banks in Kenya. The secondary data from audited financial statements and employed multiple linear regression analysis. From the findings lending rate has a negative relationship with NPLs of the Kenyan. However, this study will consider other variables like loan growth, bank size, lending rates and will use a dynamic panel regression model.

Katobu (2017), carried a research on the impact of competition on risk taking behavior of Kenyan commercial banks. The study employed secondary data. Panel regression analysis model was used. Competition was measures using market power ratio and HHI statistic, from the study findings there is a positive relation between HHI used to measure competition and NPLs an increase in HHI is a decrease in competition meaning that a decrease in competition causes an increase in NPLs. However, this study will use HHI as a measure of competition.

Fernandez *et al* (2015), conducted a research on the Mexican banking sector to measure relationship between competition and bank stability. Lerner and HHI were used to measure competition and bank stability were measured using z-index. From his study findings were that competition is positively related to financial stability. However, in this study HHI will be used as a measure of competition.

III. RESEARCH METHODOLOGY

3.1 Introduction

This is a detailed outline of the study that is the research design, target population, data collection instruments and the data analysis to be used for the study.

3.2 Research Design

Research design according to Bachman &Schutt (2016), is the approach used to bring together different components in a study in a logical way to meet the study objectives. This study will adopt causal research design. The study design is well suited for the research study because causal research design measures the effect of specific changes on existing norms and assumptions (Wangige, 2016).

According to Beach &Pedersen (2016), this research design is appropriate for understanding a phenomenon with a conditional form in this case X and Y. Since causal research design establishes relations between research variables it therefore suitable to examine the effect of lending behavior and non-performing loans of commercial banks in Kenya and the moderating effect of competition on lending behavior and NPLs of commercial banks in Kenya.

3.3 Target Population

This is a collection of individuals or objects that are the focus of query (Castillo,2009). The target population for this study is the 38 Kenyan commercial banks that have been in consistent operation from 2014-2018. This period was suitable for this study because according to the CBK, 2018 non-performing loans grew from 5.6% in 2014 to 12.7% in 2018. This increase made it necessary to conduct a research study on lending behavior and non-performing loans of commercial banks in Kenya.

3.4 Sampling Technique

This study employed census sampling technique on the 38 commercial banks that have been in existence and in constant operation from the year 2014 to 2018. Census sampling technique is the systematic process where data is obtained and recorded for the entire population under research study thus it gives the true measure of the entire population under study Lavrakas, (2008). argued that census is the systematic process whereby information is obtained and recorded for the entire population under study. Mugenda & Mugenda (2003), argued that when a population sample is small or convenient, it is necessary to include the whole population. Therefore, for this study because the population sample entailed 38 commercial banks census sampling technique was most appropriate for this research study.

3.5 Empirical Model

The researcher employed the dynamic panel regression model based on panel data because credit risk tends to persist over time meaning that the previous year NPLs may affect the current year NPLs (Ramayandi *et*

al, 2014). Therefore, non-performing loans will be shown as a function of loan growth, lending rate, loan portfolio diversification operating efficiency and bank size

$NPLs_{i,t} = \alpha + \delta NPLs_{i,t-1} + \beta_1 LG_{1i,t} + \beta_2 LR_{i,t} + \beta_3 LPD_{i,t} + \beta_4 LDL_{i,t} + \beta_5 BS_{i,t} + \varepsilon_{i,t}$

Where;

$NPLs_{i,t}$ - non-performing loans

$NPLs_{i,t-1}$ one-year lag of non-performing loans

α– constant

$LG_{1\ i,t}$ −loan growth

$LR_{2\ i,t}$ −lending rate

$LPD_{3\ i,t}$ −loan portfolio diversification

$LDL_{4\ i,t}$ −liquidity level

$BS_{5\ i,t}$−bank size

β-β −regression coefficients

$_i$ −individual commercial bank

$_t$ −time (2014-2018)

Ɛ −error term

The moderating effect of competition on lending behavior and NPLs of commercial banks in Kenya will be tested using the following model

$NPLs_{i,t} = \alpha + \delta NPLs_{i,t-1} + \beta_1 LG_{1i,t} + \beta_2 LR_{i,t} + \beta_3 LPD_{i,t} + \beta_4 LDL_{i,t} + \beta_5 BS_{i,t} + \beta_1 LG_{1i,t} * M0_{i,t} + \beta_2 LR_{2i,t} * M0_{i,t} + \beta_3 LPD_{3i,t} * M0_{i,t} + +\beta_4 LDL_{4i,t} * M0_{i,t} + \beta_5 BS_{5i,t} * M0_{i,t} + \varepsilon_i$

Where;

$NPLs_{i,t}$=non-performing loans

$LG_{i,t}$= loan growth

$LR_{2\ i,t}$ −lending rate

$LPD_{3\ i,t}$ −loan portfolio diversification

$LDL_{4\ i,t}$ −liquidity level

$BS_{5\ i,t}$−bank size

$M0_{i,t}$=moderating variable(competition)

$LG_{i,t}$*$M0_{i,t}$= interaction term

β_1 , $_2\beta_2$, β_3 = beta coefficients

IV. DATA ANALYSIS RESULTS AND DISCUSSION

4.1 Descriptive Statistics

It expounds on the basic characteristics of the data being used for the research study. The analysis provided statistics on the number of observations, mean, standard deviation minimum and maximum values, kurtosis and skewness of the study variables. The table below shows the results.

Table 4.1 Descriptive Statistics

Variable	Observations	Mean	Std Dev	Min	Max	Kurtosis	Skewness
NPLs	190	0.1382	0.1359	0	0.777	0.0000	0.0000
LG	190	0.1212	0.2447	-0.778	0.988	0.0000	0.0000
LR	190	0.1569	0.3269	0.11	0.256	0.0000	0.6723
LPD	190	0.6810	0.2023	0	1.078	0.0000	0.0000
LQD	190	0.8366	0.2579	0	1.786	0.7911	0.0000
BSZ	190	1.6531	0.5653	0.3	2.8	0.2954	0.0000
COMP	190	0.1661	0.3552	0.0002	1.999	0.0000	0.0000

Source: Research Data (2021)

From the table above there were 190 observations of 38 commercial banks that were in constant operation from 2015-2018. NPLs ratio had a mean of 0.1381573 with a standard deviation of 0.1358976, a minimum of 0 a maximum of 0.7 with a skewness and kurtosis of 0. For the NPLs ratio there is almost no variation meaning that commercial banks in Kenya nowadays are strict to lending money to lenders who are likely not to default payments

4.2 Regression Analysis and Hypothesis testing

Dynamic panel regression analysis was carried out after conducting the diagnostic tests to determine the effect of lending behavior and NPLs of commercial banks in Kenya and the results are presented below;

4.2.1 Dynamic panel regression model without a moderation variable

The results below show the effect of lending behavior and NPLs of commercial banks in Kenya using a dynamic panel regression model without a moderating variable.

Table 4.2 Dynamic Panel Regression Results

NPLs	Coefficients	standard error	Z	p>z	[95per cent conf.	Interval
NPLs L.1	0.1687	0.0771	2.19	0.029	0.0175	0.320
LG	0.051	0.0639	0.81	0.418	-0.0736	0.177
LR	-0.515	0.192	-2.67	0.008*	-0.8927	-0.137
LPD	-0.124	0.052	-2.37	0.018*	-0.2260	-0.021
LQ	-0.002	0.069	-0.03	0.974	-0.1377	0.133
BS	0.390	0.119	3.25	0.001*	0.1553	0.626
Cons	-0.399	0.240	-1.66	0.097	-0.8691	0.072

Source: Research Data (2021)

From the table above without inclusion of the independent variables NPLs of commercial banks decrease by - 0.399. Lagged NPLs has a positive coefficient of 0.1687 which showed that its overall effect on the study variables is positive meaning that banks with high NPLs in the previous year are likely to have high NPLs in the current year and also credit risk tends to persist in accordance with the risk-taking trends of commercial banks. Firstly, a unit increase in loan growth resulted to an increase in NPLs by 0.0517 times which was statistically non-significant with a p value of .0.418. Secondly a unit increase in lending rate led to a decline in NPLs by 0.51483 times which was statistically significant with a p value of 0.008. Thirdly a unit increase in loan portfolio diversification caused a decline in NPLs by 0.1237 times which was statistically significant with a p = 0.018. While a unit increase in liquidity level resulted to a decline in NPLs by 0.00229 times which was statistically insignificant with a p = 0.974. Lastly a unit increase in bank size showed there was an increase in NPLs by 0.3904 times which was statistically significant with a p = 0.001. Therefore, from the above results the equation becomes;

$$NPLs_{i,t} = -0 \cdot 399 + 0 \cdot 1687 NPLs_{i,t-1} + 0 \cdot 0517 LG_{i,t} - 0 \cdot 5148 LR_{i,t} - 0 \cdot 1237 LPD_{i,t} - 0 \cdot 00229 LQ_{i,t} + 0 \cdot 3904 BS_{i,t} + 0 \cdot 2400 \varepsilon_{i,t}$$

Regression analysis with competition as a moderation variable

The dynamic panel regression analysis showed the interactions between independent variables and competition which was the moderation variable. The results are presented in the table below.

Table 4.3 Dynamic panel regression with competition as a moderation variable result.

NPLS	Coefficient	Std. Error	Z	P>Z	95 per cent conf.	Interval
NPLS L1.	0.5003	0.0888	5.64	0.000*	0.3263	0.6743
LG	0.0346	0.0434	0.800	0.425	-0.0504	0.1197
LR	-0.4315	0.3799	1.14	0.256	-1.1176	0.3130
LPD	-0.1441	0.0641	2.25	0.024*	-0.2697	-0.0185
LQ	-0.0505	0.04115	1.23	0.219	-0.0301	0.1312
BS	0.0061	0.02769	0.22	0.826	-0.0603	0.0482
COMPE*LG	0.1647	0.4198	0.39	0.695	-0.6581	0.9875
COMPE*LR	-0.4377	1.2761	0.34	0.732	-2.939	2.0634
COMPE*LPD	-0.5651	0.4283	1.32	0.187	-0.2744	1.4044
COMPE*LQ	-0.2492	0.3469	0.72	0.473	-0.9292	0.4307
COMPE*BS	0.0632	0.1381	0.46	0.647	-0.3339	0.2075
CONS	0.2194	0.0974	2.25	0.024	0.0285	0.4103

Source: Research Data (2021)

The results above show the interactions between independent study variables and competition as the moderating variable. The lagged NPLs was positive of 0.5003 showing that NPLs have an overall effect on the study variables. For every unit increase in Loan growth there was an increase in NPLs by 0.0346 times. This increase was not statistically significant because the p =0.425. For every unit increase in lending rate NPLs had a decrease by 0.4315 times, this decline is not statistically significant because p =0.256. With a unit increase in loan portfolio diversification there is a decline in NPLs by 0.1442 times, this decline is statistically significant with p =0.024. for every unit increase in liquidity level NPLs declined by 0.05055 times this decrease is not statistically significant with a p =0.219. With every unit increase in bank size NPLs increased 0.0061 times, this increase was not statistically significant which had a p = 0.826.

Interaction between competition and loan growth, resulted to an increase of NPLs by 0.1647 which was not statistically significant. The interaction between competition and lending rate led to a decline in NPLs by 0.4377 which was not statistically significant. With the interaction between competition and loan portfolio diversification there was a decline in NPLs by 0.5650 which was not statistically significant. The interaction between competition and liquidity level resulted to a decrease in NPLs by 0.2492 which was not significant. Lastly interaction between competition and bank size led to an increase in NPLs by 0.0632 which was not significant

From the results the equation becomes;

$$NPLs_{i,t} = 0 \cdot 2194 + 0 \cdot 5003 NPLs_{i,t-1} + 0 \cdot 0346 LG_{i,t} - 0 \cdot 4315 LR_{i,t} - 0 \cdot 1442 LPD_{i,t} \cdot 05055 LG_{i,t} + 0 \cdot 0061 BS_{i,t} + 0 \cdot 1647 COMPE * LG_{i,t} - 0 \cdot 4377 COMPE * LR_{i,t} - 0 \cdot 5650 COMPE * LPD_{i,t} - 0 \cdot 2492 COMPE * LQ_{i,t} + 0 \cdot 0632 COMPE * BS_{i,t} + 0 \cdot 0974 \varepsilon_{i,t}$$

The p value of the model with competition has a moderating variable had a p value of 0.0000 which is statistically significant therefore, the null hypothesis at 5% level of significance was rejected. This study is in totality with Katobu (2017) and Fernandez et al (2015), that competition is positively significant effect on lending behavior and NPLs of commercial banks.

V. CONCLUSION AND RECOMMENDATIONS

The conclusion of the research study was drawn from the findings of this research study. The study concluded that loan growth had a positive statistically insignificant effect on the NPLs of commercial in Kenya. Therefore, an increase in loan growth causes an increase in NPLs of commercial banks this is because the more banks give loans there is likelihood of loan defaulting which results to NPLs increasing. The study concluded that lending rate had a negative statistically significant effect on NPLs of commercial banks in Kenya. Therefore, an increase in lending rates makes NPLs to decline this is because customers are likely to borrow less.

Further the study concluded that loan portfolio diversification has a negative statistically significant effect on NPLs of commercial banks in Kenya. Therefore, an increase in loan portfolio diversification leads to a decline in NPLs this is because when banks diversify loans to more secure loan investments like government securities and bills with less likelihood of being defaulted and also having a variety of loan products enables lenders to borrow from loan products favorable and pay them in time to them leading to decline in NPLs of commercial banks.

Furthermore, the study concluded that liquidity level had a negative statistically insignificant effect on NPLs. Therefore, an increase in liquidity level causes a decrease in NPLs of commercial banks this because banks are likely to reduce loan defaulters by putting in place measures of credit worthiness of their customers.

The study concluded that bank size had a positive statistically significant effect on NPLs. Therefore, an increase in bank size led to an increase in NPLs because the larger the size of the bank the more loans they lend increasing chances of loan defaulting.

Lastly, the research study concluded that competition had a significant effect on the relationship of lending behavior and NPLs of commercial banks in Kenya. Therefore, competition determines the lending behavior of commercial banks because banks with higher market share(competitive) have a larger customer base and lend more than lowly competitive thus end up more NPLs because the chances of loan defaulters are high.

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