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Effect of Bank Size on the relationship between Credit risk and Financial Performance of Commercial Banks in Kenya

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Abstract

Commercial banks in Kenya have faced daunting challenges that touch on various key financial performance indicators and therefore impacting on performance. Credit risk affects the key financial indicators that are likely to impact performance of any lending institution. The main goal of this study was to ascertain the moderating effect of bank size on the relationship between credit risk and financial performance of Commercial banks in Kenya. Longitudinal research design was utilized on data from 41 licensed banks in the country. The study relied on secondary panel data and multiple regression was used and analysis was through STATA analytical tool. The study established that bank size has a significant effect on the financial performance. Introduction of bank size has added knowledge by demonstrating that the link between credit risk and financial performance cannot be studied in isolation. The study recommends that the government and the regulators should consciously encourage mergers and consolidations of commercial banks. Bigger and well capitalized banks are essential for the stability of financial system. This could be done by giving incentives to commercial banks that would be interested in such arrangements.

Key terms: Bank Size, Credit Risk, Financial Performance, Commercial Banks

Introduction

Credit risk is at the heart of any financial intermediation which is one of the core businesses of a commercial bank. Alshatti (2015) indicates that commercial banking business is always exposed to numerous inherent risks and credit risk ranks among the critical risks particularly in a lending business. Due to the importance of the quality of assets on the financial performance of a bank, shareholders, managers, and the regulators take a very keen interest in the management of credit risks. The challenge of the deteriorating asset quality and nonperforming loans is described as a major headache to many banks and indeed to the global financial system by Sujeewa (2015) and Aladwan (2015). The rapport between credit risk and financial performance

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of banks can be influenced by various variables and may be internal or external. Some of these factors include size of a bank among others.

High levels of NPLs have been associated with poor credit risk management systems and financial performance that easily leads to a financial crisis. Increase in NPLs has a negative impact on the earnings, asset quality, capital adequacy among other key financial performance parameters making it important for regulators and policy makers. Discourse on how size affects FP has been a contentious topic among researchers. Some of them believe that big banks possess huge resources and can enjoy economies of scale which leads to lower income to cost ratios. This means the big banks can invest in more robust systems that will lead to better financial performance compared to smaller banks. The other school of thought holds that the bigger the banks are the more bureaucratic leading to inefficiency and poor financial performance.

This study is anchored on the Loanable funds theory by Robertson (1940) which stipulates that interest rate of a facility is ascertained from forces of demand and supply for funds available to save and lend to borrowers. At the core of this theory is how interest rates are determined and how the demand for credit or loanable funds helps achieve an equilibrium interest rate. The theory explains how interest rates on loans and levels of these rates have an impact on the levels of credit risk on the credit facilities. Subsequently, the levels of interest rates determine the interest income that a bank will report, and this is also influenced by the levels of the credit risk that is largely demonstrated by the levels of nonperforming loans. The theory also helps to expound the fact that size of a bank is because of organic growth derived from continuous accumulation of profits generated from the interest income. The anchoring theory has assisted in explaining the interrelationships among credit risk, size and the financial performance.

Digital revolution has revolutionized banking and as Alushula (2019) noted, commercial banks in Kenya recorded better earnings in 2018. There has been a wave of mergers and acquisitions that have led to change in the sizes of the banks involved in those transactions (CBK, 2018). The COVID-19 pandemic whose outbreak was reported in the early months of 2020 destabilized the normal way of doing business and many businesses had to either readjust or close shop due to the impact of the high volatility in global market. According to the CBK, Kshs. 1.63 trillion translating into 54.2% of the loan portfolio in the Kenyan Banking sector was restructured in 2020 due to the challenges precipitated by the COVID-19 pandemic (CBK, 2020). The central bank responded by instituting some measures that sought to protect the performance of the

banks and consequently ensure that the customers' deposits are safe. Some of those measures included the loan classifications and provisioning requirements that were to help manage the asset quality and the earnings as well.

Research Problem

Credit risk is a big challenge that continues to affect many lending financial institutions. There is a high correlation between high levels of NPLs and weak credit risk management systems. When credit risk increases, NPLs become a big challenge due to increase in collections costs and loan loss provisions that leads to poor financial performance in commercial banks (Sujeewa, 2015; Muriithi et al., 2016). Mwangi (2018) opine that financial performance is impacted by the size of a bank because size determines the capacity and resources that a financial institution can amass to address some of the key financial performance indicators.

According to the report from GCR Ratings report in the first quarter of 2021, the Kenyan banking sector is still facing huge challenges which largely include the deteriorating asset quality and stagnating growth. According to Khawaja and Din (2007) and Maina (2015), banks are experiencing unprecedented challenges that related to the key facets of financial performance. Very high interest rate spreads are one of these key challenges because as the spreads continues to soar, interest income decreases. High interest rates on credit facilities also lead to debt service fatigue which exacerbate the levels of NPLs especially where credit risk is not well managed. Increased NPLs lead to increased loan loss impairments. Other external factors such as the COVID-19 pandemic has worsened the situation and the increased credit risk negatively impacts the overall bank performance. The banking sector is also undergoing radical changes powered by competition from FinTechs, evolving business models, increasingly stringent regulation, and compliance requirements as well as disruptive technologies. Some of these stringent regulations include the requirements by the Basel II and III Accords, the Dodd-Frank Act and IFRS 9. High interest rate spread causes higher levels of credit risk.

Scholars have studied the associations between bank size and financial performance and often ended up with conflicting results. While Mwangi (2018) established that size has a direct positive impact on financial performance, other studies such as Aladwan (2015) and Dahmash (2015) contradicted that assertion. Based

on the foregoing, there is no single position regarding the impact of bank size onto the relationship between credit risk and financial performance.

Research Objective

The study sought to assess the effect of bank size on the relationship between credit risk and financial performance of commercial banks in Kenya.

Theoretical Background

Ross and Mitnick formulated the theory in 1973. Agency theory explains the relationships between principals and agents as well as the concept of delegation of control (Mitnick, 1975). The interactions between the shareholders and the agents lead to conflicts due to no-alignment of interests. These relationships are also affected by the structure of the ownership or the size of the business among other factors. The agency theory refers to the management as agents who are expected to serve the interests of the shareholders which among others include wealth maximization. These agents work hard to increase the shareholder's value at an expectation of earning commensurate remuneration or rewards. However, in real life, shareholders and management's interests are not always aligned and this leads to a conflict usually referred to as agent-shareholder problem.

The theory is critical in amplifying the impact of bank size on the relationship between credit risk management and financial performance. Bank size is a moderating factor in the relationship, and the theory helps in determining their impact on the correlation between the main variables. Bank size was measured by the logarithm of the total assets. Failure of managers in their roles could lead to more expenses and impacts performance (Heath, 2009).

Empirical Review

Mwangi (2018) considered the impact of size on FP of banks in Kenya. Using panel data over a ten-year period and analyzed through OLS, the conclusion was that size has a positive impact on FP. Operationalization of the key variables was like Aladwan (2015) and Dahmash (2015) where bank size and FP was measured by total assets and ROA respectively. The findings were in line with Abel and Le Roux (2016); Sufian and Kamarudin (2012) although Aladwan (2015), Shehzad (2013) and Dahmash (2015) were of the contrary view. Inclusion of other variables could enrich the study for instance, Mamatzakis et al.

(2017) concluded that government-owned banks were less profitable than privately owned banks. While the study produced significant results showing that size has a positive impact on profitability, the relationship was quite simplistic and could have been affected by other key factors. Introduction of other factors such as size, nature of management and ownership could have added value to the research. This made it important for this research to introduce other factors such as ownership and size to ascertain their impact on the principal relationship under study.

Saleh and Afifa (2020) explored the impact of credit risk, liquidity risk and capital on returns of banks in Jordan. Data from 13 banks listed in the securities exchange was compiled. It investigated the link between these variables after the infamous financial crisis of 2008/2009. This was a momentous moment for the banking industry that culminated into huge and very stringent controls and standards being introduced to avert another global financial crisis. A lot of changes on the management of credit risk, liquidity and capital adequacy were introduced through the new Basel regulations especially the Basel 111 regulations introduced in 2010. Key variables included the loan loss provisions to loans ratio that represented credit risk while ROA, ROA, and interest income to earning assets (NIM) were used as measures of performance. The data analysis was based on fixed effects regression model.

The outcomes gave links of causality among the identified bank-specific variables such as credit risk, liquidity risk and bank capital and FP. Some of the key outcomes included that size has a negative influence on ROA, ROE and NIM. Banks with higher liquidity and capital adequacy can face financial crisis in a better way and therefore guarantee better profitability. This study was in line with other studies such as Chege et al. (2018) or Mwangi (2018) which also concluded that credit risk has a large negative impact on FP and bank size has a meaningful positive impact on performance, respectively. Nevertheless, the study was carried out in very uncertain and unique time when the effects of a financial catastrophe were reflecting in the financial statements. If a study is done in normal times, the outcome of the study could change significantly and that is the reason such a study should be replicated in times of normal financial times.

Shehzad et al. (2013) examined how bank size, growth impacts the levels of earnings or profitability of commercial banks. They used a dynamic panel of more than 15000 banks drawn from 148 countries. One of the conclusions was that size has impact on variability of bank profitability growth. This concurred with Aladwan (2015) and Dahmash (2015) but was contrary to Mwangi (2018) and Abe and Le Roux (2016). It

also concluded that in high-income OECD countries, although more profitable, expansion of big banks is slower compared to smaller ones. OECD countries are more economically endowed compared to developing nations. A study in low-income country like Kenya would help to test the outcomes under different environment.

Kaaya and Pastory (2013) investigated the bearing of credit risk and performance of banks in Tanzania. Panel data from eleven banks was adopted and descriptive research design were applied. Regression analysis was applied and ROA was used to measure performance which is the dependent variable. Credit risk was proxied by loan loss to gross loan, NPLs, loan loss to net loan, impaired loans to gross loan. Two control variables namely, customer deposits and bank size were introduced. The conclusion was that credit risk has a substantial negative correlation with FP. This is consistent with most of the past studies as per the reviewed literature for instance Saleh and Afifa (2020); Zhongming et.al (2019) and Bhattarai (2016).

Methodology

Research design helps in mapping up a complete strategy on how to synchronize different parts of the study in a comprehensible and rational way to ensure that you will efficiently address the research problem (De Vaus, 2006). This study employed longitudinal research design as it employed continuous or repeated measures over prolonged periods of time and there it was very appropriate for such a project. Longitudinal design is also subdivided into four i.e., trend study designs, cohort study designs, panel designs and lastly time-series designs. All these designs are dependent of the sample adopted, tenor of the study, data collection time, and considers the measurements used. This study also used trend studies as they are the best in assessing the changes in a sample that runs over time. This ultimately drew results that can help in making conclusions over a populace. It is suitable because it is using panel data analysis which largely helps in analyzing two-dimensional data which is cross sectional and longitudinal.

With a population of 41 banks licensed and under the CBK's regulatory framework, the study uses panel data which helped to study changes in the identified quantitative parameters that define the variables over time. Ten year data (2010 to 2019) was assembled for each of the variables that include; credit risk (NPLs to total loans ratio); bank size (total assets) and financial performance based on the CAMELs rating scores which were operationalized as tabulated in table one below.

Table 1: Operationalization of study variables

Variable	Operation Definition	Indicator	Measurement	Scale	Comparable studies
Independent Variable -Credit Risk	Credit risk is computed based on the debtor's holistic ability to repay a loan as per the terms and conditions	Asset quality	NPLs to Gross Loans Ratio	Ratio	Sujeewa (2015); Shehzad et al., 2013
Moderating Variable -Bank Size	The size of a bank i.e., definition of how large or small the bank is.	Total assets	Natural logarithm of total assets	Ratio	Mwangi (2018); Aladwan (2015)
Dependent Variable - Financial performance	The recorded performance centered on key bank's financial parameters	Performance	CAMELs	Ratio	Babar and Lions (2012) and Ahsan (2018)

The analysis was done using various data analysis methodologies under the STATA analysis model and the results were interpreted to deduce practical lessons and knowledge that could be utilized in the efforts to improve asset quality and ultimately bank performance. Multiple regression was used in the evaluation of the data collected to test the relationships between the variables. Baron and Kenny (1986) recommended a three-step method in which regression analyses should be done and test how significant the coefficients are at each of the steps as defined in table two below. This approach allows for the estimation for each of the paths in the model which help in ascertaining if the moderator functions meet the anticipated requirements. Moderation analysis is important as it also allows a researcher to test the influence of a third variable on a certain relationship. Moderating variables can strengthen, weaken, or alter the nature or thrust of a relationship between two major variables.

Table 2: Research Objective, Hypotheses, Diagnostic Tests, and Interpretation

Objective	Hypothesis	Diagnostic Approaches	Interpretation
Determine the moderating effect of bank size on the relationship between credit risk and FP of commercial banks in Kenya.	H₁ : Bank size does not moderate the relationship between credit risk and FP of commercial in Kenya.	A regression analysis with independent predicting dependent Step 1: $FP = \beta_0 + \beta_1 CR_{it} + \epsilon$ Step 2: $FP = \beta_0 + \beta_1 CR_{it} + \beta_2 BS_{it} + \epsilon$ Step 3: $FP = \beta_0 + \beta_1 CR_{it} + \beta_2 BS_{it} + \beta_3 CR * BS_{it} + \epsilon$	Moderating effect of bank size exists if $\beta_1 - \beta_3$ is statistically Significant

Findings and Discussions

The moderating effect of bank size was assessed, and results explained using coefficient of determination (R-Square) and the regression coefficients. Hierarchical regression analysis was performed with an interaction term (a product of credit risk and bank size) introduced as an additional predictor. The moderating effect was analyzed in 3 models as guided by the following models:

$$\text{Step 1: } FP_{it} = \beta_0 + \beta_1 CR_{it} + \varepsilon$$

$$\text{Step 2: } FP_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 BS_{it} + \varepsilon$$

$$\text{Step 3: } FP_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 BS_{it} + \beta_3 CR * BS_{it} + \varepsilon$$

Table three below shows the regression coefficients for the first model;

Table 3: Regression Results

Financial Performance	Coef.	Std. Err.	z	P> z
Credit Risk	-3.382	0.176	-19.240	0.000
_cons	1.032	0.034	30.250	0.000
Wald chi2(1)	370.05			
Prob > chi2	0.000			
R-squared	53.25			

The fitted model was:

$$FP_{it} = 1.032 - 3.382CR_{it}$$

The coefficient of determination R Square was 53.25%. The model indicates that credit risk explains 53.25% of the variation in financial performance. The Wald chi2 of 370.05 illustrates the fitness of the model in regard to the effect of Credit Risk on financial performance and $p=0.000 < 0.05$ imply that the relationship between credit risk and financial performance are statistically significant. The beta coefficient of -3.382 suggests that units change in credit risk is associated with 3.382 decrease in financial performance.

The second model was;

$$\text{Step 2: } FP_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 BS_{it} + \varepsilon$$

Table four below shows the regression coefficients for the second model;

Table 4: Regression Results

Financial Performance	Coef.	Std. Err.	z	P> z
Credit Risk	-3.1754	0.2184	-14.540	0.000
Bank Size	0.0054	0.0035	1.550	0.120
_cons	0.9235	0.0773	11.950	0.000
Wald chi2(2)	372.68			
Prob > chi2	0.000			
R-squared	53.55			

The fitted model was:

$$FP_{it} = 0.9235 - 3.1754CR_{it} + 0.0054BS_{it}$$

The results indicated that the coefficient of determination R-Squared was 53.55%. The model indicates that credit risk and bank size explain 53.55% of the variation in financial performance. The Wald chi2 of 376.68 shows the fitness of the model in regard to the effect of credit risk and bank size on financial performance and $p=0.000 < 0.05$ imply that the effect of credit risk and bank size on financial performance is statistically significant. The beta coefficient of -3.1754 suggests that units change in credit risk is associated with 3.1754 decrease in financial performance. In addition, beta coefficient of 0.0384 suggests that units change in bank size is associated with 0.0054 increase change in financial performance.

The third model was;

$$\text{Step 3: } FP_{it} = \beta_0 + \beta_1 CR_{it} + \beta_1 BS_{it} + \beta_3 CR * BS_{it} + \varepsilon$$

Table five below shows the regression coefficients for the third model;

Table 5: Regression Results

Financial Performance	Coef.	Std. Err.	z	P> z
Credit Risk	-2.8926	0.2153	-13.43	0.000
Bank Size	0.0050	0.0033	1.49	0.136
CR*BS	0.0705	0.0126	5.60	0.000
_cons	0.8225	0.0763	10.78	0.000
Wald chi2(3)	426.36			
Prob > chi2	0.000			
R-squared	70.94			

The fitted model was;

$$FP_{it} = 0.8225_{it} - 2.8926CR_{it} + 0.0050BS_{it} + 0.0705CR * BS_{it}$$

In step three, the results show that the regression model of credit risk, bank size and the interaction term CR*BS on financial performance was significant with ($\beta_1=-2.8926$, $p=0.000 < 0.05$: $\beta_2=0.0050$, $p=0.0136 < 0.05$: $\beta_3=0.0705$, $p=0.000 < 0.05$). The model indicates that credit risk, bank size and the interaction term CR*BS explains 70.94% of the variation in financial performance. The Wald chi2 (2) of

426.36 shows the fitness of the model regarding the effect of credit risk, bank size and the interaction term CR*BS on financial performance.

The P value of the interaction term (CR*BS) is $0.000 < 0.05$ and the R^2 increased from 53.25% to 53.55% and 70.94% after the interaction term and thus, we conclude that bank size moderates the relationship between credit risk and financial performance. The null hypothesis was rejected that the relationship between credit risk and financial performance is not moderated by bank size.

Conclusions and Recommendations

Hierarchical regression analysis was performed with an interaction term (a product of credit risk and bank size) introduced as an additional predictor. The moderating effect was analyzed in 3 models. In the first model, the coefficient of determination R Square was 53.25%. The model indicates that credit risk explains 53.25% of the variation in financial performance. The p value $0.000 < 0.05$ implied that the relationship between credit risk and FP are statistically significant. The beta coefficient of -3.382 suggests that units change in credit risk is associated with 3.382 decrease change on financial performance.

In the second model, the results indicated that the R-Squared, was 53.55%. The model indicates that credit risk and bank size explain 53.55% of the variation in financial performance. The p value $= 0.000 < 0.05$ imply that the relationship between credit risk and bank size are statistically significant. The beta coefficient of -3.1754 suggests that units change in credit risk is associated with 3.1754 decrease change on FP. In addition, beta coefficient of 0.0384 suggests that units change in bank size is associated with 0.0054 increase on financial performance. In step three, the results show that the regression model of credit risk, bank size and the interaction term CR*BS on FP was significant with ($\beta_1 = -2.8926$, $p = 0.000 < 0.05$; $\beta_2 = 0.0050$, $p = 0.0136 < 0.05$; $\beta_3 = 0.0705$, $p = 0.000 < 0.05$). The model indicates that credit risk, bank size and the interaction term CR*BS explains 70.94% of the variation in financial performance.

The P value of the interaction term (CR*BS) is $0.000 < 0.05$ and the R^2 increased from 53.25% to 53.55% and 70.94% after the interaction term and thus, we conclude that bank size moderates the relationship between credit risk and FP. The null hypothesis was rejected that the relationship between credit risk and FP is not moderated by bank size. The findings are in line with Shehzad et al. (2013) who examined how

bank size and growth affect the levels of earnings or profitability of commercial banks and established that size has an impact on variability of bank profitability growth.

The study has demonstrated that bank size has a significant impact on the relationship between credit risk and FP. According to the outcomes, an increase in bank size equally has a positive impact on the subject relationship. Growth in bank size could occur through an organic growth which involves ploughing back of the profits made or through mergers and consolidations. The most recent major merger/acquisition in the banking sector was in 2019 when CBA and NIC banks merged into NCBA Group PLC. This substantially increased the size of the bank to be one of the biggest tier 1 banks in Kenya.

The findings and conclusions concurred with Aladwan (2015) and Dahmash (2015) Sujeewa (2015) and Muriithi et al. (2016). Aladwan (2015) examined the effect of bank size on the profitability of listed commercial banks in Jordan. The banks were segmented into different sizes and categorized. It concluded that size has a significant positive impact on profitability. Dahmash (2015) study was in Jordan as well but focused on a non-financial institution, but the conclusion was still the same that size has a positive impact on the FP of a company. However, the results were in contradiction with those of Adusei (2015) who established that there is no significant impact of bank size on FP. Other studies that have confirmed the effect of size on bank performance include Mwangi (2018), Saleh and Afifa (2020), Shehzad et al. (2013) and Kaaya and Pastory (2013).

The study also demonstrates that the size of a bank has a positive influence on FP. According to the CBK, banks are classified into three major clusters: Tier1, 2 and 3. According to CBK, this classification is based on a weighted index of total assets, shareholders' funds, customer deposits, loan book and savings accounts' balances. The bigger the bank the more the resources at disposal to be able to build more robust credit risk management structures that helps in mitigating credit risks. This translates into better returns for the commercial banks. The government and the regulator should consciously encourage mergers and consolidations of commercial banks. Bigger and well capitalized banks are essential for the stability of financial system. This could be done by giving incentives to commercial banks that would be interested in such arrangements. For instance, in 2019, the Treasury exempted CBA and NIC banks from paying share transfer tax in the merger arrangement. This could be introduced in form of a policy decision or framework that will encourage smaller banks to consider future mergers or consolidations.

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