# EFFECT OF RISK-BASED LENDING ON THE FINANCIAL PERFORMANCE OFTIER III COMMERCIAL BANKS IN KENYA

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**DECLARATION**

This is my original thesis and has not been submitted before for approval for the award of a degree in this University or any other University.

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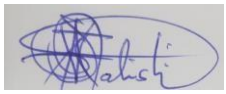
Signed: 

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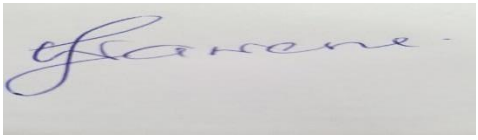
Signed: 

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## ABSTRACT

Risk-based lending was authorized by Central Bank of Kenya in 2019, enabling lenders to adjust loan interest rates depending on the risk profile of a borrower. This was meant to increase access to credit among economic agents. The general objective of the study is to determine the effect of risk-based lending on the financial performance of Kenyan commercial banks before and after the introduction of risk-based lending. The particular objectives were to explore the effect of risk-based credit scoring and risk-based lending interest rates levied on bank financial performance before and after the introduction of risk-based lending. The study was anchored on credit risk theory supplemented by loan pricing theory and credit scoring theory. Positivist research philosophy was adopted and guided by correlational research design. The target population was 22 tier III commercial banks covering the period of 2016 to 2023, the period before the risk-based lending was introduced (2016-2019), and the period during the risk- based lending (2020-2023). Secondary data was extracted from tier III banks' financial statements and records between the periods 2016-2023. In addition, primary data was collected from lending officers of the tier III banks using interviews. The investigation utilized content analysis approach in the analysis of qualitative data collected through interviews with lending officers. Stata software version 16 was utilized in the analysis of panel data. The analysis involved descriptive and inferential statistics. The descriptive tests comprised maximum and minimum values, Kurtosis, Skewness, standard deviation and the means. Inferential statistics were in the form of panel analysis with structural breaks. From the results, the correlation between risk-based credit scoring and financial performance was both positive and significant statistically ($r=0.5517$, $p = 000<0.05$). Regression results before the introduction of risk-based lending in Kenya (2016-2019) indicate that the coefficient of risk-based credit scoring was positive 0.0000073 and statistically significant ($0.000 < 0.05$) while after the advent of risk-based lending in Kenya, (2020-2023), the coefficient of risk-based credit scoring was positive 0.0000077 and statistically significant ($0.000 < 0.05$). The correlation between risk-based lending interest rate and financial performance in Kenya was both positive and significant statistically ($r = 0.5427$, $p = 000<0.05$). The effect of risk-based lending in Kenya (2016-2019) indicate that the coefficient of risk-based lending interest rate was positive 0.000205 and statistically significant ($p = 0.000<0.05$). After the introduction of risk-based lending in Kenya (2020-2023), the coefficient of risk-based lending interest rate was positive 0.000188 and statistically significant ($0.000 < 0.05$) implying a decline in the aggregate effect of risk-based lending interest rate compared to the period before. The correlation between bank size and financial performance was both significant statistically and positive ($r = 0.5603$, $p = 000<0.05$). The coefficient of bank size was positive 0.00035 and statistically significant ($p=0.000<0.05$) implying that a unit improvement in bank size would yield 0.00035 units significant improvement in the performance of the Kenyan commercial banks financially. Thus, bank size has a significant strengthening effect on the relationship between risk-based lending and the financial performance of tier III commercial banks. The study concluded that risk-based credit scoring, risk-based lending interest rate and bank size are significant determinants of variations in the performance of Kenyan tier III commercial banks financially. The investigation recommended that the tier III commercial banks ought not to focus so much on the credit scores while advancing loans to its customers. The banks ought not to segregate customers based on the levels of their credit risks. Finally, the banks ought to focus on building their asset bases.



**Key Words:** Commercial banks, financial performance, Kenya, risk-based lending,

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| CBK: | Central Bank of Kenya |
| FICO: | Fair Isaac Corporation |
| GDP: | Gross Domestic Product |
| NACOSTI: | National Commission for Science, Technology and Innovation |
| NPLs: | Non-Performing Loans |
| ROA: | Return on Assets |
| ROE: | Return on Equity |
| SARB: | South African Reserve Bank |
| SARB: | South African Reserve Bank |
| SMEs: | Small and Medium Enterprises |
| USD: | United States Dollar |

**DEDICATION**

I wish to dedicate the dissertation presented herein to my dear family for the mental and financial support, advice, and genuine corrections. Additionally, I recognize my friends for the support especially during discussion groups.

**ACKNOWLEDGMENTS**

This academic endeavor would not succeed without the grace of God. I thank God for keeping me well and allowing me to finish this project on time. I also acknowledge the support of my family. My family provided me with emotional and social support that kept me going. You were an encouragement when things seemed tough and I will not take that for granted. In addition, I recognize and thank my supervisor for her unwavering help and advice. Your invaluable support gave me the confidence to achieve my best.

# CHAPTER ONE

# INTRODUCTION

## 1.1 Background of the Study

The banking sector is a significant financial player whose key role entails the mobilization and preservation of funds and financing individuals and businesses with credit. The sector plays a significant role in the economy. Its role in the economy entails supporting the economy's financial system and hence contributing to the nation's socioeconomic development (Vikas et al., 2022). Globally, the sector contributes to approximately 20 to 25% of the economy (Ross, 2021). The industry employment rates is approximately 7.7 million employees and USD 3 trillion global commercial bank size. The industry also provide a source if financial intermediation and stability (Mohsin, 2016).

The financial sector contributes significantly to various economies as they provide financial support to governments, households as well as having significant contribution to the socioeconomic transformation of the society. Given that the banking sector contributes to the socioeconomic transformation of a country, the financial performance of the sector is significant to the researchers, policymakers as well as practitioners as the sector maps the financial health of the operators in maintaining their day-to-day activities. However, the performance of banks is affected by a myriad of elementsthat include bank internal factors like credit risk, lending, liquidity risks, and total assets (Ekinci & Poyraz, 2019; Saleh & Abu Afifa, 2020) and external elements like macroeconomic factors (Lutf & Omarkhil, 2018; Sarkar & Rakshit, 2023) and regulatory environment (Agala & Gichure, 2019).

Commercial banks generate revenue from several business activities charging fees on banking services offered like checking accounts, financial counselling, and the sales of other financial products (insurance and mutual funds). However, earning interest from loans provided in the form of mortgages, auto loans, business loans, and personal loans remains the main source of bank revenue (Feyen & Huertas, 2020; Kiweu, 2012). As indicated in the 2023 Central Bank of Kenya (CBK) statement, lending remains one of the main banking businesses. As such, a bank's main exposure is credit risk. As per CBK (2023) and Ghenimi et al. (2017), the soundness of the banking system is largely affected by the level of credit risks. With unchecked credit risk in the form of high non-performing loans (NPLs), many banks have made huge losses or collapsed (Kwashie et

al., 2022; Wallace & Brown, 2023). Consequently, banks have been forced to engage in risk-based lending to reduce to bank fatality associated with credit risks. Credit risk exposure has made lending business by banks the most common way where banks lose their funds to bad loans (Olusanya et al., (2012). To correct this, commercial banks have resorted to extending credit to customers based on credit exposure while charging different interest rates that align with their level of interest rate (Zhong, 2013).

Risk-based lending occurs when lenders provide credit loans to consumers by charging different interest rates or credit terms based on their likelihood to default in repaying the loans advanced (Harvard University Employees Credit Union, 2022). In this method, lenders link loan prices to borrowers' risk levels and their historical credit behaviors (Nyawira, 2021). Risk-based lending is being continuously adopted to facilitate adequate evaluation of the borrower's creditworthiness and determine the terms of loans in financial institutions in the modern world. Risk-based lending allows the banks to evaluate the credit risk of their clients to determine the interest rate to be charged based on different customer credit risk exposures. According to Kagan (2020), risk-based lending scrutinizes the factors correlated with the borrower's ability to repay the borrowed funds, income, employment status, credit score, collateral, presence of guarantor, assets, and debt level. Under risk-based pricing, high-risk borrowers are charged high-interest rates whereas low-risk borrowers are subjected to low interest levies (Center for Capital Market Competitiveness, 2021). As such, risk-based lending anchors its operations on credit terms laid, the level of interest rate to be charged and the loan approval rate based on the time takes to undertake a scrutiny of the borrower (Mukatuni, 2021; Müller et al., 2021).

Risk based lending is an essential financial strategy where the terms of a loan, suchas the loan amounts and interest rates, are customized according to the borrower's risk profile (Bruno et al., 2017). Various risk assessment approaches consider factors that could influence borrower's capability torepay the loan, including their credit history, employment stability, income, existing debts, and associated relevant financial information (Müller et al., 2021). Lenders assign a risk level to the borrower, often expressed as a credit scoreor rating and later use this risk assessment to determine the loan terms (Dani et al., 2023).

In the United States, banks have been pricing loans based on the associated risk. With most loans, higher risk leads to a higher interest rate and lower risk results in a lower interest rate. With risk-

based lending, the banks in the United States aim to attain profitability margin, bolster stability, and enhance their growth by reducing instances of NPLs. As such, there has been a steady decline in cases of NPLs to total loans from 5 percent in 2009 to 0.7 percent in 2022 (Statista, 2022).

In Russia, credit risk monitoring as guided by bank credit policies is highly emphasized to reduce cases of bad loans and measure borrower's ability to repay the borrowed money to increase interest rate revenue for the bank (Van Horne, 2011). According to Morozov and Danilova (2017), the banks in Russia apply differentiated risk weights to mortgage loans, based on consumers' payment- to-income levels and loan-to-value. In India, leading banks have introduced plans to charge the credit loans extended to borrowers as per their level of credit scores ((Kumar, 2020). There is a perception that risk-based pricing of loans in India would be beneficial to the lender and borrower (Kumar, 2020). The lender would be able to assess the risk of a customer before giving out a loan thus reducing cases of default rates. On the other hand, the borrowers especially those with high credit scores can access credit loans at affordable interest rates.

In South Africa, credit risk arising from bad loans remains a problem for many banks. As indicated in the banking report (South African Reserve Bank [SARB], 2019), the South African banking sector encountered a significant loss due to credit write-offs. Banks wrote off a combined value of USD 8.54 billion in advanced loans in 2019 representing a 22% increase from 2018 (SARB, 2019). As a result, the banks have introduced the risk-based pricing of credit loans to reduce the cases of bad loans (Mukatuni, 2021).

Credit loans are the major source of revenue for many retail banks in East African countries, as they are in other countries across the globe (Altunbas, 2009). However, the chance of borrowers defaulting on the borrowed funds has significantly gone up, especially for unsecured loans causing concerns among the banks. According to Central Bank of Kenya, non-performing loan to gross loan ratio have continued increasing with the ratio being at 12.5% in January 2019 to 14.45% in March 2021 and have consistently rose to 15.3% in 2023 (Omondi, 2023). The high default rate constitutes a high risk to the banks and the economy in general. Considering economic importance of the banking sector, managing credit risks that are likely to threaten their operations and sustainability is crucial. Banks extend loans to consumers with the expectation of reaping interest income, which depends on the ability of the borrowers to repay the loans plus interest rates without defaulting (Harcourt, 2017).

In the stressed lending market in Uganda, banks have been in the process of reviewing the risk control practices to understand customer level of credit risks. According to Ciborra (2012), policymakers have constantly been urging banks to carefully monitor the credit risks of customers as advised by the Central Bank of Uganda to minimize cases of credit defaults. To help banks better manage and diversify their credit risk, the Uganda Banking Act, for example, has regulations pertaining to maximum restrictions on the accommodation of credit. As noted by Krestlow (2013), failure to undertake due scrutiny of the customer contributed significantly to cases of loan defaults by a majority of banks in Uganda. However, banks are yet to adopt risk-based lending in Uganda to minimize cases of bad loans that arise because of customer default.

In Kenya, risk-based lending was approved by CBK in 2019, enabling lenders to adjust loan interest rates depending on a borrower's risk profile while attempting to improve credit access. The goal of risk-based lending was to open more opportunities for individuals and businesses viewed as risky to access credit by paying a high interest rate based on their credit risk levels. Likewise, the move was meant to reward borrowers with good credit scores with lower interest rates (Tiriongo et al., 2023).

Despite the growing prominence of risk-based lending in the banking industry, past scholars have not adequately conceptualized risk-based lending (Harvard University Employees Credit Union, 2022; Kagan, 2020; MMukatuni, 2021; Müller et al., 2021). Risk-based lending by banks is based on the credit risk exposure and interest rate to be charged (Harvard University Employees Credit Union, 2022). According to Mukatuni (2021) and Müller et al. (2021), risk-based lending anchors its operations on credit terms laid, the level of the interest rate charged, and loan approval rates based on the time taken to scrutinize borrowers' creditworthiness. Kagan (2020) indicates that risk-based lending scrutinizes the factors correlated with the ability of the borrower to repay the borrowed funds, income, employment status, credit score, collateral, presence of guarantor, assets, and debt level. In addition, it is yet to be explored how risk-based lending has impacted the financial performance of commercial banks (Ekinci & Poyraz, 2019; Siddique et al., 2021).

Existing studies have focused on credit risk levels in banks and how it has impacted their financial performance (Ekinci & Poyraz, 2019; Siddique et al., 2021) but not based on the separation of customer's credit risks in terms of differential interest rates charged, credit terms, and loan approval rates an indication of a conceptual gap. Locally in Kenya, a study on risk-based pricing by Tiriongo

et al. (2023) established that credit risk affected lending rates alongside bank idiosyncratic attributes like bank sizes, deposits, and bank efficiency. However, the study by Tiriongo et al. (2023) did not narrow down the direct impact of risk-based lending on bank's financial wellbeing. Furthermore, Tiriongo et al. (2023) did not also consider other critical concepts associated with risk-based lending like risk-based credit scoring, interest rate charged and bank size.

Bank size is touted in research to have direct impact on profitability of the banking institutions (Hasanov et al., 2019; Kwashie et al., 2022) or moderating effect (Kihuro et al., 2022; Konya et al., 2019). Ekinci and Poyraz (2019) and Kwashie et al. (2022) postulated that the size of bank has significant positive impact on bank financial performance. However, Nguyen (2021) noted that bank size significantly but negative affects bank performance using ROA and ROE in Vietnam. This is an existence of empirical gap as past studies have pointed bank size to positively affect bank financial performance. It is based on this that the proposed research seeks to explore the impact risk-based lending on banks' financial performance with focus to tier III banks in Kenya.

### 1.1.1 Financial performance of commercial banks

The financial performance of a firm entails its financial wellness to maintain and fund its business operations on daily basis (Fatihudin, 2018). It also outlines the firm's efficiency in the utilization of its resources to create value to its shareholders in the process of generating revenue (Tudose et al., 2022). Performance entails the attainment of non-financial and financial parameters. Financial parameters entail the assessment of the entity's financial health in terms of monetary gains and include profitability ratios and profits. The non-financial parameters take qualitative forms and includes corporate brand outlook, the innovativeness of a firm, customer satisfaction, product development as well as the market share (Nguyen et al., 2020).

Return on assets and return on equity comprise the commonly used measures of measuring the profitability of a firm (Thiagarajan, 2018). Profitability ratios measure the firm's efficiency in generating revenue from its invested resources and include ROE and ROA. ROA measures the efficiency of a firm in the utilization of its resources to make income and denotes the returns earned to a certain level of assets. ROE measures the efficiency of a business in the utilization of equity from the shareholder's funds and shows the total income from the shareholder's equity. Greater ROE is an indication of better performance as well as the prospectus of the bank (Pinto et al., 2017).

Various authors have measured banks' financial performance using different parameters. Shkodra (2019) measured the performance of banks using ROA and profit margin while Handayani and Winarningsih (2020), and Mukendi and Manda (2022) used ROA to measure the performance of banks in Zambia. According to Reed (2015) and Shkodra (2019), common measures of banks' financial performance comprise the return on assets, profit margin and return on equity. Hagel (2018), Laing and Dunbar (2015) and indicated that ROA is a comprehensive measure parameter for measuring the firm's financial performance.

Based on the studies, ROA and ROE are common profitability measures of the bank (Kaddumi et al., 2023). Compared to ROE, ROA forms the most commonly used and the effective measure of profitability because the measure it is not prone to financial engineering. ROA is a commonly used measure as it measures the firm's efficiency in generating revenue. The key drivers of the sustainability of commercial banks are their profits (Rutkowska-Ziarko, 2015). The financial performance of the tier III commercial banking institutions under review were operationalized using ROA as the measure is less prone to financial engineering. Table 1.1 presents ROA and ROE statistics for commercial banks in Kenya.

**Table 1.1: ROA and ROE Statistics**

| | Tier III | | Tier I | |
|---|---|---|---|---|
| Year | ROA | ROE | ROA | ROE |
| 2021 | 1.72% | 6.78 % | 3.29% | 29.49 |
| 2022 | 0.167% | 3.06 % | 4.5% | 31.83 |

### 1.1.2 Commercial Banks in Kenya

CBK categorizes banks as tier I, tier II and tier III banks. This categorization of these banks is based on the total assets and market share. According to CBK (2022), tier I comprise big banks with large total assets of over KES 500 billion and also huge customer deposits. For tier II the total bank assets are between 300-499 billion while for tier III the bank assets are lower than 300 billion. When grouped using market share as the parameter, tier I banks controls an estimated 74.8% of

the market share, the second tier 16.4% of the share of the market whereas tier III makes up 8.8% of the market share (CBK, 2022). Finally, using asset base as the parameter, tier III has KES 463 billion (9%) asset base, tier II KES 968 billion (16%) and tier I KES4.5 trillion (75%) (CBK, 2022).

In Kenya, there are 22 tier III commercial banks according to the 2022 CBK report. Interest income from loans to customers is a major source of revenue for commercial banks. Though the financial performance of a bank is contributed by various bank-specific factors and revenue sources, interest income generated from lending to customers forms a significant source of revenue for the bank. Bank profitability of lower tier banks especially tier III banks in Kenya has not been stable with various banks recording losses, collapsing, engaging in mergers and acquisitions, or exiting the market (CBK, 2021).

Tier III in Kenyan commercial banks are not financially performing well in comparison to tier II or tier I banks. This results to questioning if the size of the bank in terms of assets it controls influences the linkage between risk-based lending and profitability of tier III banks. For instance, the Return on Assets (ROA) for tier III banks in 2022 was 0.167% and Return on Equity (ROE) of 3.06% (CBK, 2022) compared to ROA of 4.5% and ROE of 31.83% for tier I banks. In 2021, the ROA for tier III banks was -1.72% and ROE of 6.78% (CBK, 2021) compared to ROA of 3.29% and ROE of 29.49% for tier I banks. Furthermore, several tier III banks collapsed that comprise Imperial Bank in 2015 and Chase Bank in 2016, others put under receivership such as Dubai Bank of Kenya or acquired by other banks like Habib Bank that was acquired by Diamond Trust Bank and in 2017, Jamii Bora Bank Limited by the Cooperative Bank of Kenya Limited in 2020 (CBK,2022).

Risk-based lending in Kenya among commercial banks was introduced in 2019 after the abolishment of interest rate capping. The introduction of risk-based lending succeeded in the interest rate capping that came into operation in 2016. The interest rate capping was meant to reduce the high cost of credit and promote more access to loans by a majority of excluded households and SMEs (CBK, 2018). With the risk-based lending model, the banks are required to differently price their loans based on the customer's level of risk of default. As at 2023, the CBK had cleared 33 commercial banks (84%) to engage in risk-based lending. Interest rates are levied on customers based on their probability to default. The broader perspective for risk-based credit

pricing among banks is to reap more interest income from the loans advanced to riskier borrowers by charging high rates instead of denying them access to credit (CBK, 2023). However, this may not necessarily result in more interest income for banks as high rates charged may promote high loan default rates. It also promotes moral hazard in form of predatory lending and discrimination.

Additionally, risk-based lending is likely to drive away customers for fear of high interest rates to rival banks or other lenders like savings and credit corporative societies and microfinance institutions. Further, Monasterio (2022) cites predatory lending and discrimination of customers, which would jeopardize a free market economy. As per Tiriongo et al. (2023), deploying the risk-based lending technique is ambiguous because customers are not homogenous, and hence using similar credit evaluation criteria would lead to biased customer evaluation for legibility to high or lower interest rates to access loans. Currently, the base rate lending rate set by CBK is 12.5%. The risk base lending model does not specify if low-risk customers would get an interest rate charge lower than the base rate resulting in policy ambiguity.

### 1.1.3 Risk-Based Lending in Kenya

The abolishment of interest rate capping in Kenya in 2019 paved the way for the emergence of risk-based lending. The CBK introduced the interest rate capping policy in 2016 as a remedy to the high cost of credit that was perceived to hinder credit access to a majority of households (CBK, 2018). The Banking Act of 2015 tied the lending rates at 4.0 percent above the CBK rate of 10.5% at that time (CBK, 2016). The deployment of the interest rate capping act was expected to increase credit access by lowering the costs of credit. However, the interest rate capping law did not address the core purpose as it resulted in banks tightening up their credit terms, and as such, many individuals and businesses were denied access to affordable credit as earlier envisioned. As per African Business (2020), many Small and Medium Enterprises (SMEs) were denied credit loans estimated to be USD 2.97 billion, about 1perecnt of Kenya's Gross Domestic product (GDP) at the time. In addition, credit provision to SMEs as the percentage of aggregate loans provided by the banks declined to 15 percent in 2019 compared to 25 percent in 2015 before the capping.

Because, the effectiveness of monetary policy in promoting the spirit of a free market economy as a result of interest rate capping and led to more credit denial (Alper et al., 2020), it was abolished in 2019 paving the way for risk-based lending in Kenya (CBK, 2019). Under risk-basedlending, the banks are required to differently price their loans based on the customer's level of riskof default.

As for 2023, the CBK had cleared 33 commercial banks (84%) to engage in risk-basedlending. Under this approach, high interest rates are levied on customers perceived to be risker borrowers whereas lower interest rates are subjected to customers with better credit scores (CBK, 2023). The broader perspective for risk-based credit pricing among banks is to reap more interest income from the loans advanced to riskier borrowers by charging high rates instead of denying them access to credit. This is in line with the spirit of promoting financial inclusion, however, this may not necessarily result in more interest income for banks as high rates charged may promote high loan default rates.

Despite the risk-based lending model taking prominence, the policy has equally attracted proponents and at the same time antagonists. According to the proponents, risk-based lending would allow many borrowers to access credit loans as the lender shall have the liberty to price the loans based on the risky exposure of each of the customers (Center for Capital Market Competitiveness, 2021; Raiter & Parisi, 2004). According to the Center for Capital Market Competitiveness (2021) and Edelberg (2006), risk-based pricing would lower the cost of credit for borrowers with higher credit scores while creating a fairer marketplace. As a result, many individuals and small enterprises, which have been experiencing challenges to access formal credit, would access credit.

Furthermore, critics of risk-based lending postulate that the pricing model would lead to predator lending, exploitation of the customers, and instead of reducing default rate among risky borrowers further exacerbate default rate (Müller et al., 2021; Nyawira, 2021). According to Nyawira (2021), risk-based lending would provide rich customers access to affordable loans while low-income borrowers would be subjected to high costs to access credit, which is against the perceived endeavors of the policy. The consequences would be credit denial to the perceived risky customers and increased default rate among the customers who were charged high-interest rates for being seen as risky borrowers. As such, the banks instead of recording fewer cases of NPLs, the number of defaulted loans would sharply increase (Monasterio, 2022). Defaults can lead to significant revenue loss for lenders. In addition, risk-based lending is likely to drive away customers for fear of high interest rates to rival banks or other financial institutions like microfinance institutions and savings and credit corporative societies that would accommodate them by levying favourable interest rates.

Opponents of risk-based lending also cite predatory lending and discrimination of customers, which would jeopardize a free market economy. As per Tiriongo et al. (2023), deploying the risk-based lending technique is ambiguous because customers are not homogenous. The result is a decline in bank interest income because of high default rates and fewer borrowers. When commercial banks lend to high-risk borrowers with high interest rates, the banks may increase their exposure to more defaults. Risk-based lending relies on the accuracy of customer data and any inaccuracies in interpreting customer data may disadvantage other customers. Risk based lending may also lead to potential revenue cuts (San, 2019).

### 1.2 Statement of the Problem

In Kenya, banks in lower tier specifically tier III seen to be recording lower profitability margins in comparison to larger banks in tier I or II resulting to the questioning if bank size has any effect on this (CBK, 2024). The ROA for tier III banks in 2022 was 0.167% and ROE of 3.06% (CBK, 2022) compared to ROA of 4.5% and ROE of 31.83% for tier I banks. In 2021, the ROA for tier III banks was -1.72% and ROE of 6.78% (CBK, 2021) compared to ROA of 3.29% and ROE of 29.49% for tier I banks. Furthermore, several banks in the tier III have collapsed, put under receivership, acquired or sought for merger with other tier II or tier one banks (CBK, 2023). The ROA level for tier III banks is below acceptable levels of 4% and above (Hargrave, 2022) being recorded by tier I banks. Nonetheless, Maverick (2023) argues that ROA of 1% to 2% represents just a good profit or revenue margin for a bank. The banks' financial performance also depends on loan defaults. The % net NPLs to gross loans for tier III banks was 6.9.1% in 2019, 10.4% in 2020, 14.8% in 2021 and 15.1% in 2022 (CBK reports, 2020, 2021, 2022). High bad loans have been one of the factors resulting in declining bank performance and even the collapse of some tier III banks like Imperial Bank (CBK, 2023).

To tame cases of high loan default, commercial banks through the guidance of the CBK introduced risk-based lending in 2019 (CBK, 2019). The policy, however, has brought debate among researchers, practitioners, and policymakers on the viability of the policy in promoting financial inclusion in the market and whether it results in improved bank performance via reduced loan defaults. The proponents of the risk-based lending Center for Capital Market Competitiveness (2021), Edelberg (2006), Raiter and Parisi (2004) argue that many borrowers would be able to access credit loans, as the banks shall have the liberty to levy different interest rates based on the

customer level of risk exposure to default. However, critics of risk-based lending argue that the pricing model would lead to predator lending, and exploitation of the customers and instead of reducing the default rate among risky borrowers further exacerbate the default rate (Müller et al., 2021; Nyawira, 2021).

The existing studies have focused on credit risk levels in banks and how it has impacted their financial performance (Ekinci & Poyraz, 2019; Siddique et al., 2021) but not based on the separation of customer's credit risks in terms of differential interest rates charged, credit terms, and loan approval rates an indication of a conceptual gap as the current study sought to determine the effect of risk based credit scoring and risk based interest rates levied on the financial performance of the banks under study. Locally in Kenya, a study on risk-based pricing by Tiriongo et al. (2023) established that credit risk affected lending rates alongside bank idiosyncratic attributes like bank sizes, deposits, and bank efficiency. However, the study by Tiriongo et al. (2023) did not narrow down how risk-based lending affects banks' financial performance. It is on the basis of this that the proposed investigation sought to explore risk based credit scoring and risk based interest rates levied on financial performance of tier III commercial banks in Kenya before the period risk- based lending was introduced in 2019 and after it was introduced.

### 1.3 Research Objectives

This research was anchored by a main and specific objective as shown;

#### 1.3.1 General objective

The general objective was to investigate the effect of risk-based lending on the financial performanceof tier III commercial banks before and after the introduction of risk-based lending in Kenya.

#### 1.3.2 Specific Objectives

The specific objectives were to:

i. Determine the effect of risk-based credit scoring on financial performance of tier III commercial banks in Kenya.

ii. Establish the effect of risk-based interest rates levied on financial performance of tier III commercial banks in Kenya.

## 1.4 Research Questions

i. What is the effect of risk-based credit scoring on financial performance of tier III commercial banks in Kenya?

ii. What is the effect of risk-based interest rates levied on financial performance of tier III commercial banks in Kenya?

## 1.5 Scope of the Study

The focus of this research was the impact of risk-based lending on profitability of tier III banks before and after Kenya introduced risk-based lending. The banks' financial performance is however, affected by many other elements. These include bank internal elements like macroeconomic elements like inflation, exchange rates among other factors as well as management efficiency, size of the bank, liquidity, asset quality as well as capital adequacy. The investigation at hand narrowed to the effect of risk-based credit scoring and risk-based interest rates levied on the profitability of tier III banks prior the adoption of the risk-based lending in Kenya and during its deployment. For geographical scope, the study targeted 22 tier III cleared by the CBK to do risk-based lending in Kenya.

The study has targeted tier III banks because they have been recording declining financial performance that has been attributed to ballooning default loans (Ngode, 2021). Thus, the introduction of risk- based lending was meant to reduce the default and improve interest income for the commercial banks. Some tier III banks have been put under receivership by CBK, collapsed or acquired by other banks because of unstable financial performance. The time scope was 2016 to 2023, the period before the risk-based lending was introduced (2016-2019), and the period during the risk- based lending (2020-2023). The period before the risk-based lending was introduced (2016-2019) and the period during the risk-based lending (2020-2023) was captured as a dummy variable (D), where D=0, implies period prior the adoption of the risk-based lending in Kenya and D=1, is the period during the risk-based lending in Kenya. According to Karafiath (1988), a dummy variable is employed in an event study to represent a subgroup in a population sample.

## 1.6 Significance of the study

The investigation shall be significant to practice, policy, and research.

### 1.6.1 Significance to Practice

High loan default rates continue to confront many commercial banks. Taming high loan default rates while ensuring access to credit loans by different customers is significant to the socio-economic change of the country. As such, the investigation outcome would illuminate the costs and benefits of risk-based lending both to the borrower and the banks. The technique may help ensure access to credit to high-risk individuals and firms who would have otherwise been denied access by charging a higher interest rate. However, this may not necessarily be the case as high interest rates charged on risky borrowers may scare away the borrowers. On the side of the lenders (banks), charging high interest rates on already risky borrowers would more likely result in a high loan default rate hence a decline in bank profitability margins. The research outcome would thus attempt to crack the practicality dilemma of the policy.

### 1.6.2 Significance to Policy Makers

This study may be used as a useful information tool for policymakers like the CBK, Kenya Bankers Association, and Competition Authority of Kenya through the Consumer Protection Department as they formulate or review policies pertaining the risk-based lending. The players may review the policies to ensure that the policies promote the sustainability of the banks without jeopardizing the consumer rights to fair pricing. The outcomes of the study may inform the policy makers on the advantages and disadvantages of risk-based lending on financial performance of the commercial banks under study.

### 1.6.3 Significance to Research

This study would usefully and significantly contribute to informing scholars as a reference for further studies on risk-based lending and bank financial performance. The study would also inform research gaps in the field of study that would inform further studies by future scholars.

## 1.7 Chapter Summary

The chapter presented an in-depth synthesis of risk-based lending and bank performance from global, regional, and local perspectives. Research gaps emanating from past scholars regarding risk-based lending and bank performance were explored. The problem statement was formulated and supported by statistics and knowledge gaps. The chapter proceeds to outline the importance of the research to banks especially tier III, and policymakers through the CBK, Kenya Bankers Association and Competition Authority of Kenya and future research. The chapter ended by presenting a summary of the research.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

The theories that guided the proposed research are discussed in this chapter. Further, in-depth, synthesis of past studies is undertaken as guided by the study objectives to identify knowledge gaps. It winds by presenting how the study variables have been operationalized as well as conceptual framework.

## 2.2 Theoretical Framework

This research was anchored on credit risk theory. It was also guided by loan pricing theory and credit scoring theory. The study adopts a multi-theory approach to anchor this study. This is because one theory might not be sufficient to anchor all the objectives of the study. After all, every theory has a strength and weakness. For instance, credit risk theory measures the quantity and probability of risks without quantifying their impacts in terms of monetary value. This is cured by introducing the loan pricing theory that looks at how the potential risk of default and puts an appropriate price tag to cover this. Again, the loan pricing theory only indicates the price of the loan without indicating the features looked at when determining the pricing value of the loan. This limitation is cured by the credit scoring theory that defines the features looked at when evaluating the creditworthiness of the potential borrower.

### 2.2.1 Credit Risk Theory

The theory was advanced by Merton (1977) and views an organization's credit risk in terms of capital structure, and equity versus debt financing in the company. This is an indication that borrowers' failure to meet their obligation to repay credit borrowed impacted the bank's capital structure. To organization risk experts, practitioners, and policymakers, credit risk remains one glaring problem. This is worsened by complexities in measuring credit risk to ascertain the appropriate amount of capital structure that firms should hold to offset themselves in case of adverse credit risks. Thus, the theory attempts to define the quantity of credit risk exposure and the probability of default.

According to Truck and Rachev (2009), credit risk theory thus attempts to clarify the idea of the credit portfolio, credit spread, and credit loss management. To reduce cases of borrowers' default,

due credit checks about the borrower have to be conducted and pegged on the level of security required to access the credit (Thakor, 2016). As such, high default rates would be associated with high-interest rates. Though credit risk theories are meant to measure credit risk, they fail to consider other elements and factors that affect the ability of the borrower to repay the borrowed funds like industry-specific risks or macroeconomic factors. This is the main limitation of this theory.

Credit risk theory is significant in highlighting the significance of risk-based credit scoring and risk based lending interest rates to reduce loan default. Commercial banks would have to charge higher rates, especially for customers perceived to be risky borrowers. Consequently, the bank's financial performance would depend on its ability to minimize the cases of credit defaults. In addition, based on the credit risk theory, the lenders (tier III banks in this case) may review their borrowers' assessment criteria in line with the Central Bank of Kenya guidelines on bank-customer relations. In addition, the effectiveness of credit risk mitigation may depend on the specific bank strategies and resources put in place. The theory thus is relevant in ascertaining the impact of risk-based lending and bank size on profitability of tier III banks before and after the advent of risk-based lending in Kenya. However, credit risk theory measures the quantity and probability of risks without quantifying their impacts in terms of monetary value. This is cured by the loan pricing theory that looks at how the potential risk of default and puts an appropriate price tag to cover this.

### 2.2.2 Loan Pricing Theory

The theory was proposed by Stiglitz and Weiss (1981). As per the theory, the banks often put high lending rates to compensate for any default. The theory also emphasizes the need to consider asymmetric information, moral hazard problems, and adverse selection pricing loans to attract more interest income (Stiglitz & Weiss, 1981). This is supported by Chodecal (2004) who argued that majority of borrowers tend to develop moral hazard behaviours by participating in riskier activities after obtaining loans and advances.

High lending rates are set by lenders as per the loan pricing theory. As such, considering moral hazard, information flow, and adverse selection guide the pricing of loans being advanced (Stiglitz & Weiss, 1981). When lenders propose high lending rates, an adverse selection problem is triggered making more riskier customers willingly accept the high rates. However, it may not be

always true that the interest rates set by banks equal the risky nature of risky borrowers. This theory also recognizes the direct and indirect costs of the banks' activities that may result in high rates of access to loans.

Thus, the amount of loans disbursed would be affected by the pricing. The failure to do diligent moralhazard habits may lead to risky loans being priced lowly resulting in more credit risks in case of defaults. Moreover, adverse selection may creep in because of high lending rates. This would result in a decline in loan portfolio with the result being high prices to access loans.

The theory is essential in understanding the risk-based interest rates adopted by banks as an avenue to minimize loan default while enhancing credit access to many potential borrowers with different creditworthiness. The differential interest rates levied by the banks would tend to affect the total cost of loanable money. In turn, loan uptake is severely impacted undermining the banks' lending business activities. It supports the objective to explore the influence of risk-based interest rates levied on the financial performance of tier III commercial banks before and after the introduction of risk-based lending in Kenya. One significant limitation of the loan pricing theory is that; it only indicates the price of the loan without indicating the features looked at when determining the pricing value of the loan (Camba-Mendez & Mongelli, 2021). This limitation is cured by the credit scoring theory that defines the features looked at when evaluating the creditworthiness of the potential borrower.

### 2.2.3 Credit Scoring Theory

Credit scoring theory was advanced by Satyajit (2004). The theory defines the features looked at when evaluating the creditworthiness of the potential borrower. As per the theory, screening customers to assess their ability to repay borrowed funds is the first step in reducing credit risks. According to Chatterjee et al. (2023), lenders have deployed the 5Cs in evaluating clients' viability to be given a loan. The 5Cs comprise capacity, character, capital, collateral, and condition. With the 5Cs the lenders better understand their customers hence reducing the level of credit risks.

Character defines the integrity, and trustworthiness of the borrower as it defines their ability to willingly repay the borrowed funds. Capacity defines the ability of the borrower in terms of resources to repay the loan (Abdou & Pointon, 2011). On the other hand, capital connotes the household, businesses, or individuals in terms of assets and liabilities when seeking credit loans.

Collateral is the asset the borrower is willing to give away in case of default; but could also mean the presence of a guarantor to pay the loan on behalf of another borrower in case of default. Conditions are terms that lender considers the before extending credit to the borrower. Thus, a credit scoring model attempts to classify borrowers based on their ability to repay the borrowed loans (Abd Rabuh, 2020). The main weakness of the credit scoring theory is that although it ranks the risk levels of the borrower, it does not elaborate the probability of default associated with the borrower. It only indicates the borrower's level of risks from highest to the lowest.

The credit scoring theory is significant in informing the risk based credit scoring adopted by the Tier III commercial banks in Kenya. The risk-based credit scoring model being adopted by the commercial banks in Kenya anchors its operations on knowing well the borrower in terms of credit history and background checks. Thus, the theory is helpful in the evaluation of borrowers before extending credit loans. It anchors the objective on how risk-based credit scoring affected the financial performance of tier III banks in Kenya before and after the introduction of risk-based lending.

### 2.3 Empirical Review

The sections outline the empirical inquiry of existing studies about the study objectives. The empirical literature review has been conducted as guided by the study of thematic areas. The critique of the studies was undertaken to reveal research gaps.

#### 2.3.1 Risk-based Lending Credit Score and Financial Performance

Credit score focuses on criteria meant to assess borrowers' creditworthiness. In Rwanda, Nshimiyimana (2023) studied credit management and financial performance of Equity Bank Remera branch using descriptive and correlation research design and found that credit score positively impacts the profitability of commercial banks using ROE. Likewise, Mariyamungu and Kengere (2023) researching on credit management practices and performance of Rwandan Access bank PLC financially employed descriptive and correlational research design. The studies by Mariyamungu and Kengere (2023), and Nshimiyimana (2023) both presented a methodological gap by deploying a case study whereas this study employed a mix of time series and cross-sectional approaches. Case study results can be difficult to replicate in other populations hence they may not be representative. Nshimiyimana (2023) employed ROE to measure bank performance. The proposed study employed ROA as a measure of bank financial performance. Compared to ROE,

ROA forms the most commonly used and the effective measure of profitability because the measure it is not prone to financial engineering (Rutkowska- Ziarko, 2015).

In addition, the sample size employed by Nshimiyimana (2023) was small at 24 observations. The sample size used is small which may not be effective for estimating regression model tests. According to Kroll and Song (2013), parametric tests using multiple linear regression require a minimum sample size of 30 observations. The current study shall employ panel data from 2015 to 2018 (before risk-based lending credit score was introduced) and 2019 to 2023 after the introduction. Using structural breaks in the analysis, the proposed research purposed to explore the impact of non- credit score on profitability of tier III banks before and after Kenya introduced risk-based lending in 2019.

In the US, Claessens et al. (2018) found that credit lending depends on the credit score of the borrower. Markov et al. (2022) in a systematic review of studies from 2016-2021established that credit scores have been deployed by financial institutions to identify creditworthy borrowers. Nonetheless, the researches, by Claessens et al. (2018) and Markov et al. (2022) failed to quantitatively investigate the impact of risk-based lending credit scores on the profitability of commercial banks. The proposed research seeks to establish the effect of risk-based lending credit scores on profitability of tier III commercial banks before and after Kenya introduced risk-based lending.

Das et al. (2017) examined the correlation between corporate defaults and common shortcomings. They discovered that credit scoring was applied to different contexts, such as supporting the approval of personal applications. In their study on credit scoring, Aveny et al. (2019) discovered that debtors do not provide financial information for their company's assessment. In contrast, the banks did not impose any requirements on the borrower to provide periodic reports on the performance of the financed firm while granting credit. Whereas credit scoring reduces subjective judgments and possible biases, it significantly increases costs. This is an indication that credit scoring may not necessarily result in increased financial performance in a firm.

The process of making decisions that lead to a borrower being granted credit is still centered around credit evaluation. Determining whether or not to approve a credit proposal is the primary goal of a credit review. It comprises using the borrower's loan application to determine the borrower's capability to repay the borrowed loans on time. In assessing borrower's creditworthiness, factors such as loan size, borrower goal, security, and borrower's capacity to repay the loan are taken into consideration.

Several studies have been conducted on the role of risk-based lending credit evaluation criteria on financial performance of firms. Credit evaluation has a major impact on banks' profitability, according to research done in Nepal by Bhatt et al. (2023) on the factors that influence credit risk management and how those factors are related bank performance. However, a research by Arifaj and Baruti (2023) studying credit risk and probability of banks among Balkan Countries employing ROE and ROA found that credit risk evaluation was inversely related to bank performance. This is an empirical gap because past studies have shown that credit evaluation had a positive impact on bank performance (Bhatt et al., 2023; Ongeri et al., 2021). This could mean that too much credit evaluation may turn away even credit-worthy potential borrowers denying the bank revenue from loans. Additionally, the researches were undertaken in different countries that may have differential regulatory frameworks governing the banks. The system of regulation might be different from Kenya's commercial bank's regulatory framework.

A multiphase neural network aggregate learning model was used by Lean et al. (2017) to evaluate credit risk at the assessment standard. Additionally, Piramuthu (2017) did a study on credit-risk evaluation decisions while Ndyagyenda (2019) investigating credit risk management and bank performance indicated that strong credit evaluation defines a bank’s survival and profitability of bank of Africa. The studies presented methodological gaps by deploying a case study whereas this study employed an amalgamation of time series and cross sectional approaches. Case study results can be difficult to replicate in other populations hence they may not be representative. In a study by Nurwulandari et al. (2022) on risk-based bank scoring and profitability of 41commercail banks in Indonesia covering 2014-2019, it was established that credit hurt financial performance.

Among local studies in Kenya, Ongeri et al. (2021) employing descriptive research design, evaluated credit evaluation impacts on commercial banks’ performance financially in Kisii County and found that credit evaluation significantly affects bank performance in the study locale. Another

research by Lagat and Bogongo (2023) also using a descriptive survey design explored that collection policy, credit standards and terms positively affect the profitability of banks in Eldoret. However, the studies by Lagat and Bogongo (2023), and Ongeri et al. (2021) employed primary data and descriptive survey design to measure how credit evaluation impacts bank financial performance yet secondary data could be used. This is a methodological gap that the proposed study sought to address by determining the impact of risk-based credit evaluation on profitability of tier III banks using secondary data. In addition, there is a gap in terms of the research design adopted. Descriptive survey design may not be effective when assessing the impact of credit management at one point in time. Longer periods are required to achieve more representative and accurate results. The proposed study seeks to establish how risk-based credit evaluation affect bank performance from 2015 to 2018 (before risk-based credit evaluation was introduced) and 2019 to 2023 after the introduction.

### 2.3.2 Risk-based Lending Interest Rates Levied and Financial Performance

Considering the role of banks' internal factors, Tiriongo et al. (2023) carried out a study on risk-based credit pricing in Kenya spanning the period 2003-2021 and established that credit pricing in Kenya is affected by credit risk, efficiency, and bank size among others. Tiriongo et al. (2023) further revealed that the deployment of risk-based pricing was heterogeneous and depended on internal policies and bank-specific features. However, the study by Tiriongo et al. (2023) did not narrow down the influence of risk-based lending on profitability of banks.

Studying credit-scoring methods among 13 Jordanian commercial banks covering the years 2011 to 2018, Markov et al. (2022) established that interest rates moderately affect banks' performance. Additionally, interest rate risk positively affects financial performance as noted by Odeke and Odongo (2014). In this study, the interest rate levied was homogeneous. However, in the current model involving, risk-based lending, the interest rates would be heterogeneous based on the creditworthiness of the borrower. This provides a gap as the current investigation seeks to determine whether charging different interest rates on credit loans would promote or hinder bank performance.

Windsor et al. (2023) investigating the significance of interest rates on bank profitability over the period 2019 to 2022 among 1,500 banks operating in 10 banking systems showed that interest rate

charges reduce banks' net interest margins. Another study by Dondi et al. (2023) determining the effect of lending interest rates on profitability of mortgage-offering commercial banks in Kenya over the period 2015 to 2022 established that lending interest rates substantially and adversely impact bank performance. This is an indication of a gap in practice because risk-based lending was meant to improve bank net interest revenue by levying different interest rates for different customers with different default risk levels. In the current model involving, risk-based lending, the interest rates would be heterogeneous based on the credit level of the borrower. The current investigation seeks to fill the gap by determining whether charging different interest rates on credit loans would promote or hinder bank performance. It thus employed structural breaks in the analysis; this study seeks to establish the impact of risk-based lending interest rates levied on financial performance of tier III prior and during the risk-based lending period (from 2019) with a focus on tier III banks Kenya. This is a methodological dap to ascertain the impact of the new lending policy.

### 2.3.3 Bank Size, Risk-Based Lending and Financial Performance

Bank size has been touted in research to have direct impact on profitability of banks (Hasanov et al., 2019; Kwashie et al., 2022) or moderating effect (Kihuro et al., 2022; Konya et al., 2019). Common measure of bank size has been true use of total assets. Using longitudinal research design, Kihuro et al. (2022) studying bank size effect on the nexus between profitability and the risk associated with credit in Kenya established that bank size significantly affects profitability of banks. Similarly, Konya et al. (2019) using descriptive research design investigated how financial risk exposure and bank size affects Kenyan commercial banks' performance financially noted bank size moderate the influence of the exposure on risk on the banks' profitability levels. The researches by Kihuro et al. (2022) and Konya et al. (2019) did not study bank size effects when implementing risk-based lending practices among banks.

According to Tiriongo et al. (2023), the implementation of risk-based credit pricing would depend on bank size. However, Tiriongo et al. (2023) but did not show how bank size and risk-based lending affect profitability of banks. Utilizing generalized methods of moments, Hasanov et al. (2019) indicated that bank size significantly positively affects the financial performance of banks. Likewise, Kwashie et al. (2022) in Ghana and Ekinci and Poyraz (2019) in Turkey pointed out the significant positive impact of the size of the bank on bank financial performance. Nevertheless,

Nguyen (2021) noted that bank size significantly and negatively affects the ROA and ROE of banks in Vietnam. This is an existence of empirical gap as past studies have pointed out that bank size positively affects bank financial performance. Mkhaiber and Werner (2021) in the United States indicated inverse nexus existing between the size of banks and ability of these banks to extent credit to small sassed business enterprises.

### 2.4 Research Gaps

The existing studies have focused on risk associated with credit and financial performance of banks (Ekinci & Poyraz, 2019; Siddique et al., 2021) but not based on the separation of customer's credit risks in terms of differential interest rates charged, credit terms and loan approval rates an indication of the conceptual gap. Locally in Kenya, a study on risk-based pricing by Tiriongo et al. (2023) established that credit risk affected lending rates alongside bank idiosyncratic attributes like bank sizes, deposits, and bank efficiency. However, the investigation by Tiriongo et al. (2023) did not narrow to the effect of risk-based lending on financial performance of Tier III banks. Researches by Markov et al. (2022) and Windsor et al. (2023) found that lending interest rates affect bank performance. However, the studies did not show whether the impact was positive or negative. In addition, the interest rates employed by Markov et al. (2022) and Windsor et al. (2023) were uniform across thebanks. However, the current lending model involving, risk-based lending is heterogeneous where the rates are different for all customers based on their level of creditworthiness. The current assessment seeks to fill the gap by exploring whether charging different interest rates on credit loans would promote or hinder bank performance. The summary of research gaps is shown in Table 2.1.

**Table 2.1: Summary of Research Gaps**

| Author | Title | Finding | Research gaps | The focus of thecurrent study |
|---|---|---|---|---|
| Bhatt et al. (2023) | Determinants of credit risk management and their relationship with the performance of commercial banks in Nepal | Credit evaluation has a significant effect on financial performance of banks in Nepal | However, the study focused on banks in Nepal whose system of regulation mightbe different from Kenya's commercial bank regulatory framework | The proposed study seeks to determine the effect of risk- based lending credit evaluation on of tier III commercial banks before and after the introduction of risk-based lending in Kenya. |
| Ongeri et al. (2021) | Effect of credit evaluation on financial performance of commercial banks. | Credit evaluation had a statistically significant effect on financial performance of commercial banks. | However, the study employed primary data to measure the effect of credit evaluation on bank financial performance yet secondary data could be used. | This is a methodological gap that the proposed study seeks to address by determining the effect of risk- based credit scoring on financial performance of tier III using secondary data and interview guide. |
| Arifaj and Baruti (2023) | Effect of credit risk on the financial performance of commercial banks | Credit risk evaluation was inversely related to bank performance. | This is an empirical gap because past studies have shown that credit evaluation | Seeks to determine the effect of risk- based credit riskevaluation on bank performance |

| | | | | |
|---|---|---|---|---|
| | in Balkan Countries | | had a positive impact on bank performance | |
| Lagat and Bogongo (2023) | Effect of credit management on financial performance | Credit terms, credit standards, and collection policy positively affects the financial performance of commercial banks | There exists a methodological gap because the study was cross- sectional whereby the study was a panel study. A cross- sectional study may not be effective when assessing the impact of credit management at over time | The proposed study seeks to determine the effect of risk- based credit evaluation on bank performance from 2015 to 2018 (before risk-based credit evaluation was introduced) and from 2019 to 2023 after the introduction |
| Ndyagyenda (2019) | Credit risk management and financial performance with a case study of Bankof Africa | Strong credit evaluation defines a bank's survival and profitability | The study presented a methodological gap by deploying a case study whereas this study employed a mix of time series and cross sectional approaches. Case study results can be difficult to replicate in other populations hence they may not be representative. | The proposed study adopted a panel approach |

| | | | | |
|---|---|---|---|---|
| Nshimiyimana (2023) | Impact of credit management on performance financially of commercial bank with a focus on Equity Bank Remera branch | Credit score was found to have a positive impact on the profitability of commercial banks | The sample size used is small which may not be effective for estimating regression model tests. According to Kroll and Song(2013), parametric tests using multiple linear regression require a minimum sample size of 30 observations | The current study shall employ panel data from 2015 to 2018 (before risk- based lending credit score was introduced) and 2019 to 2023 after the introduction. |
| Claessens etal. (2018) | how credit ratings affectbank lending under capital constraints | Credit lending effects to be strong for smaller, riskier, and capital-constrained banks as well as for borrowers with poorer credit quality and unsecured | However, the study did not determine the effect of risk- based credit scores on financial performance. | The proposed study seeks to establish the effect of risk- based lending credit scores on financial performance oftier III banks |

| | | | | |
|---|---|---|---|---|
| Markov et al. (2022) | Credit scoring methods | Credit score has been deployed by financial institutions to identify creditworthy borrowers | However, the study did not quantitatively determine the effect of risk- based lending credit scores on financial performance ofcommercial banks | Seeks to determine the effect of risk- based lending credit score on of tier III commercial banks before and after the introduction of risk-based lending in Kenya |
| Mkhaiber and Werner (2021) | Relationship between bank size and the propensity to lend to small firms | There is inverse relationship between bank size and the propensity of banks to lend to small businesses | This is a methodological gap because it seeks to determine the impact of the size of banks on bank performance before and after the introduction of the bank policy. | Seeks to determine the effect of bank size on the effectof risk-based lending on performance of tier III commercial banks before and after the introduction of risk-based lending in Kenya |
| Hasanov et al. (2019) | Macroeconomic as well as bank-specific determinants of bank profitability | bank has positive and significant effect on financial performance of banks | This is a methodological gap because it seeks to explore how bank performance is affected by the size of banks before and after the introduction of the bank policy. | Using structural breaks in the analysis, the proposed seeks to determine the impact of bank size on bank performance before and after the introduction of risk-based lending in Kenya |

| | | | | |
|---|---|---|---|---|
| Kwashie et al. (2022) | Impact of credit risk on financial performance of commercial banks in Ghana | size of bank has significant positive effect on bank financial performance | This is an existing empirical gap because past studies have established that bank size has a significant influence on banks' performance for instance Nguyen (2021). | Seeks to do structural breaks in the analysis to determine the impact of risk- based lending on bank performance. |
| Tiriongo et al. (2023) | Risk-based credit pricing inKenya | Implementation of risk-based pricing would be heterogenous and dependent on bank-specific characteristics | However, the study by Tiriongo et al. (2023) did notnarrow to the effect of risk-based lendingon bank financial performance. | Seeks to determine the effect of risk- based lending on financial performance of banks. |
| Markov et al. (2022) | Credit scoring methods | Interest rate risk has a positive effect on financial performance | In this study, the interest rate levied was homogeneous. However, in the current model involving, risk- based lending, the interest rates would be heterogeneous based on the borrower's creditworthiness | This provides a gap the current investigation seek to fill by exploring whether charging different interest rates on credit loans would promote or hinder bank performance. |

## 2.5 Conceptual Framework

Figure 2.1 outlines the conceptual framework of risk-based lending and financial performance of tier III commercial banks prior and during the risk-based lending in Kenya. The independent variables are risk-based lending credit score, risk-based lending interest rates levied and bank size as a control variable. Financial performance of tier III commercial banks prior and during the risk-based lending in Kenya is the dependent variable. It is postulated that risk-based lending credit score, and risk-based lending interest rates levied affect the profitability of tier III banks in Kenya.

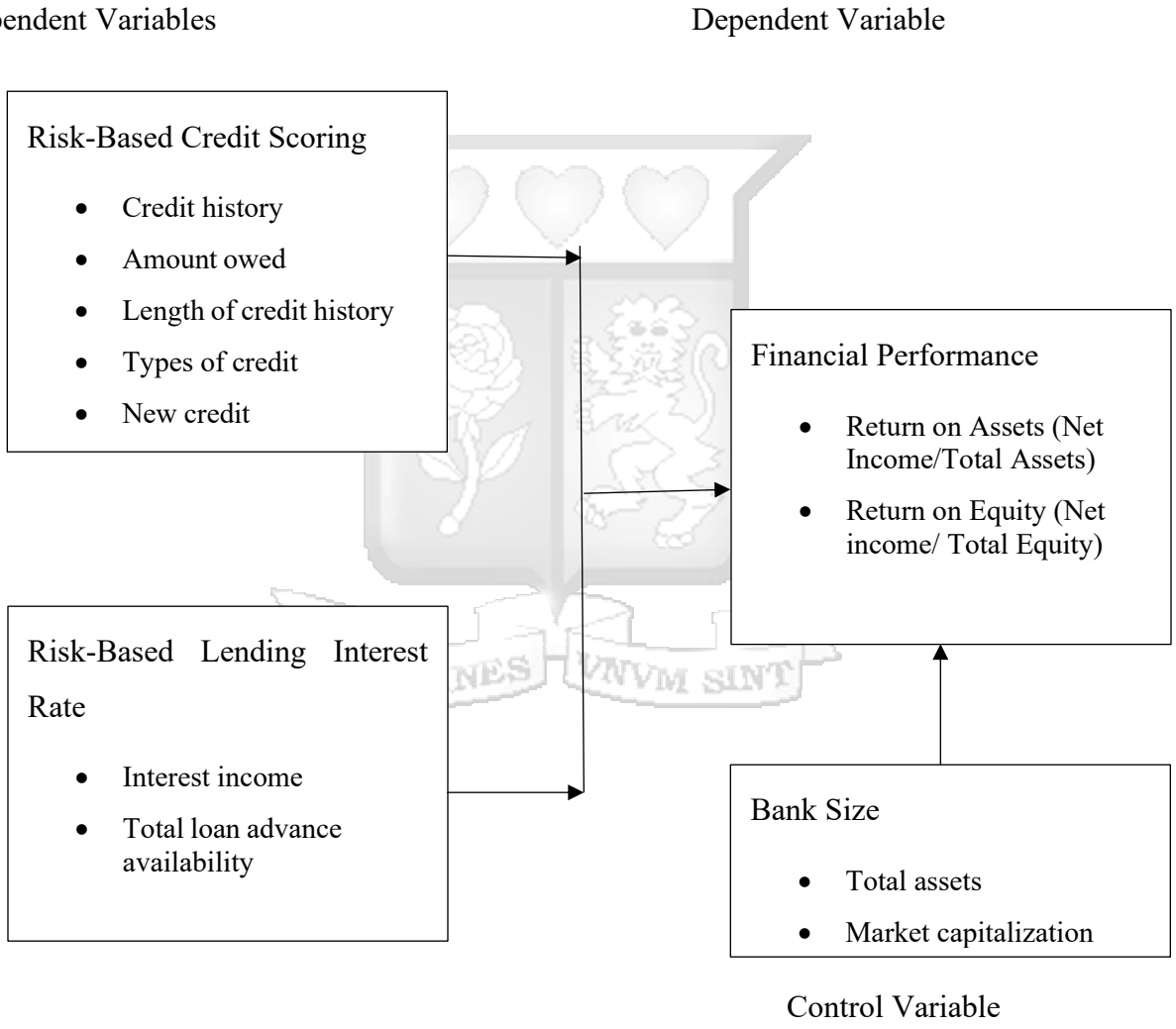


**Figure 2.1: Conceptual Framework**

## 2.6 Operationalization of Variables

Table 2.2 shows how each of the variables is measured. The independent variables are risk-based lending credit score and risk-based lending interest rates levied with bank size as the control variable. Financial performance of tier III commercial banks before and after the introduction of risk-based lending in Kenya is the outcome variable.

**Table 2.2 Operationalization of Variables**

| Variable | Description | Measurementindicators | Literature sources | Supporting Theories |
|---|---|---|---|---|
| Risk-based lending creditscore | Refers to customers' levelof creditworthiness | • Credit score levelbased on Fair Isaac Corporation(FICO) calculator. FICOfairly considers bother aspects ofthe borrower andthe lender hencenot biased. FICOassess on clientsbased on credithistory (35%), amount owed(30%), length ofcredit history(15%), types of credit (10%) and new credit (10%). This was thenconverted to FICO scale (300-850) where lowervalues imply low credit scores andhigher valuesmean high creditscores. Averagecredit scores were calculated for each of the period2016-2023 | Kroll and Song (2013), Claessens et al. (2018) and Markov et al. (2022) | Credit risk theory, loan pricing theory, and credit scoring theory. |
| Bank size | Refers to total assets of thebank | • Log of total assets | Hasanov et al. (2019), Kwashie et al. (2022), Konya etal. (2019), Kihuro etal. (2022) andTiriongo et al. (2023) | |
| Risk-based lending interest rates | Refers to the amount of levycharged in extending creditloans to customers by afinancial | • %interest ratecharged on different customers basedon their credit risklevels. Average %interest ratecharge for each of the bank over theperiod 2016-2023was computed | Abbeam et al. (2018), Bonnke et al. (2022), Markov et al. (2022), Tiriongo et al. (2023) and Windsor et al. | |

| | | | | |
|---|---|---|---|---|
| | institution | | (2023) | |
| Financial performance of banks | Is the attainmentof bank s'financial goals like net profits | • Return on assetsto be perceived asnet income to total assets of each of the bank over the period 2016-2023 | Fibriyanti & Nurcholidah, (2021), Kablay, and Gumbo (2021). | |

## 2.7 Chapter Summary

The chapter provided the theories that guided the study. The theories include credit risk theory,loan pricing theory, and credit scoring theory. In addition, an empirical review of studies was conducted on the effect of risk-based lending credit score ad risk-based lending interest rates levied on financial performance of tier III commercial banks before and after the introduction of risk-based lending in Kenya. The chapter also presented a summary of the research gaps and conceptual framework.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

The chapter presents the methodology that the research adopted which includes research design, philosophy, target population as well as the sampling methods, methods of data collection as well as analyzing data. The chapter further outlines the ways in which the researcher ensured ethical conduct and research quality.

## 3.2 Research Philosophy

This research adopted the positivist research philosophy. In contrast to the interpretivism philosophical approach, which places the researcher in a subjective position, positivism seeks an objective, unconditional and independent view. Its research outcomes are observable and quantifiable truths that can be ascertained statistically (Tamminen & Poucher, 2020). This implies that the research assumes unambiguous and accurate knowledge. With positivism, problem is formulated based on the objective or the subject of the study. A structured methodology is the followed in answering research objectives guided by scientific principles. The positivist research philosophy is suitable for this study because it helped answer research questions by anchoring the study on scientific objectivity (Park et al., 2020).

Positivism is rooted in the belief that knowledge can be obtained through objective observations and measurements. With scientific objectivity, the study sought to make scientific claims and adopt the most appropriate method to make inferences about the population. With positivism according to Park et al. (2020), the researcher seeks to answer the objectives of the study including the effect of risk based credit scoring and risk based interest rates levied on financial performance of banks under study by collecting relevant data and interpreting it objectively. Thus, in this study adopting the positivist philosophical approach, enabled the objective measurement of the study variables and following scientific methodologies to collect, analyze, and interpret the study findings.

## 3.3 Research design

This research utilized a correlational research design, which is instrumental in examining correlations between variables without including any control or manipulation on the part of the researcher. A correlation shows how strongly and/or in which direction two or more variables are

related to one another. Finding correlations between variables i.e., those where changing one causes a change in another is the goal of correlational research. The ability to forecast scores and elucidate the link between variables is made possible by correlation research.

According to Tan (2014), correlation study designs employ statistical tests to quantify and characterize the strength and nature of the connection or link between two or more variables. Nshimiyimana (2023) employed a correlation research design investigating the effect of credit management on bank performance focusing on Equity Bank Remera Branch in Rwanda. The correlational research design was employed to determine the impact of risk-based lending credit score, risk-based lending interest rates levied on performance financially of tier III banks in Kenya. It also determined the effect of bank size of bank size as control variable.

### 3.4 Population and Sampling

Population refers to an aggregate of subjects intended to be studied in a universe. It is from these subjects that a conclusion about the population is drawn (Stillwell & Clarke, 2011). The target population is the community of interest (Acharya, 2010). The target population for the study were Tier III commercial banks in Kenya. There are 22 tier III commercial banks in Kenya (CBK, 2022). The study targeted tier III banks because they have been recording declining financial performance that has been attributed to ballooning default loans. Thus, the introduction of risk-based lending was meant to reduce the default and improve interest income for the commercial banks. Some tier III banks have been put under receivership by CBK, collapsed or acquired by other banks because of unstable financial performance. The study also targeted 22 lending officers from tier III banks, one lending officer from each of the bank. They have also crucial information concerning the operations of the Risk-based lending pricing and how it has impacted performance of the tier III banks, customer borrowing behavior and interest income of the tier III banks.

#### 3.4.1 Sampling procedure

Sampling is a process where a portion of the target group is selected to represent a given study (Levy & Lemeshow, 2013). Sampling is a deliberate selection of several members of a population who provided the data from which conclusions were drawn for larger population groups that these samples represent. In sampling, the determination of whither the sample is a true representation of the population is critical. A census of all the 22 tier III commercial banks in Kenya who were cleared by the Central Bank of Kenya to undertake risk-based lending participated in the study. In

addition, all the 22 lending officers from the tier III banks were selected to participate in interviews for the investigation. When the target population is small, Cantwell (2008) indicates that a census technique is the most appropriate method. This sampling design is appropriate because one can study the population in its entirety within the shortest time. The census technique may also minimize bias by including all the items in the population. The census method is also significant in solving the accuracy challenges of sampling method (Khan, 2018).

### 3.5 Data Collection Methods

Secondary data is particularly applicable due to the type of variables under review. Thus, secondary data for the key variables under review were collected for all the 22 tier III banks. The data was extracted from the bank records as well as the financial statements of the banks under review between the periods 2016-2023. The period has been selected to facilitate a comparative investigation on the effect of risk-based lending on financial performance of tier III from 2016 to 2019 (before risk-based lending was introduced) and 2020 to 2023 after the introduction of risk-based lending in Kenya. This presents an event study thus, it would be more feasible to compare two period regimes, the period during interest rate capping and the period during risk-based lending. The abolishment of interest rate capping in 2019 gave birth to risk-based lending. The period before the risk-based lending was introduced (2016-2019) and the period during the risk-based lending (2020-2023) was captured as a dummy variable (D), where D=0, implies period before the introduction of the risk-based lending in Kenya and D=1, is the period during the risk-based lending in Kenya. According to Karafiath (1988), a dummy variable is employed in an event study to represent a subgroup in a population sample.

The financial records also included the tier III commercial bank financial reports and the supervision reports of the Central Bank of Kenya prior and after Kenya introduced risk-based lending. The data to be collected were annual, covering the period 2016-2023 for risk-based credit scoring, risk-based interest rates levied, size of the banks and financial performance of tier III commercial banks before and after the introduction of risk-based lending in Kenya using returnon assets.

The variables of the study were risk-based lending credit score, risk-based lending interest rates levied and size of the bank as the predictor variables, and financial performance of tier III commercial banks prior and after risk-based lending was introduced in Kenya as the outcome

variable. In collecting data for risk-based lending credit scoring, the study assessed customers' ability to repay the borrowed funds based on customer's character, capacity, capital, collateral, and conditions using credit evaluation forms capturing this information. The raw credit evaluation score was converted to FICO Credit Score Ranges. The credit score ranges from 300-850 where a smaller score means low creditworthiness of the customer while a higher score means high creditworthiness (Teamsters Council Union, 2022).

In addition, the study collected data for bank size in KES. Bank size was measured as a logarithm of total assets of each of the tier III banks. Bank size was similarly measured this way by Abbeam et al. (2018), Bonnke et al. (2022), Markov et al. (2022), Tiriongo et al. (2023) and Windsor et al. (2023). Further, the risk-based lending interest rates levied by each of the banks as per the customer's level of risk was also collected, and the average interest charge computed in line with Abbeam et al. (2018), Bonnke et al. (2022), Markov et al. (2022) and Tiriongo et al. (2023). Finally, the study computed the ROA of each bank over the study period by collecting net interest income and total assets.

The data for each of the variables was then cleaned and arranged as panel series data for analysis covering all the 22 tier III commercial banks in Kenya that have been cleared by the Central Bank of Kenya to undertake risk-based lending. The total observations over the study period were 176 observations (88 observations before the period risk-based lending was introduced (2016- 2019) and 88 observations during the risk-based lending period (2020-2023).

In addition, primary data was collected using interview guide for triangulation purposes. The interview guide attached in Appendix III was used to collect data from lending officers. The lending officers participated in the interview session. A consent through a written letter to the tier III banks was sought requesting the permission to engage the lending officers in the interview. The researcher clearly highlighted the intention of the study, request for the appropriate time to undertake the interview session. Each of the interview session, time and venue was agreed by upon with each of the lending officers. The time and venue were communicated in time. Any adjustment to the venue and time or withdrawal from the study by the lending officers was accepted. The time for the interview took approximate 20-30 minutes. The identity of the lending officers was concealed by using unique codes (LO1, LO2, LO3…LO22) where LO denote Lending officer Use of unique codes ensured anonymity of the participants.

### 3.6 Data Analysis

The procedure of data analysis entails giving data order, a definite structure, and computed meaning to a huge data amount (Wickham & Wickham, 2016). The process of changing raw data into important information that is useful in providing solution to a problem is what encompasses data analysis (Khan, 2018). Data analysis involved qualitative and quantitative data analysis techniques. The qualitative analysis was undertaken using content analysis. Content analysis approach was employed to analyze qualitative data collected through interviews with lending officers. Content analysis is an analysis technique where key themes are put together in line with the key themes of the study. Various processes are involved content analysis and entails; identify, analyze and interpret patterns of meaning within qualitative data, identifying key themes in the responses, grouped together, interpreted and presented in prose form and reporting them in prose form. The qualitative findings were triangulated with the quantitative findings from the quantitative data collected through the questionnaire. The quantitative analysis shall entail the descriptive and inferential tests.

The descriptive tests comprised the maximum and minimum values, Kurtosis, Skewness, standard deviations and means. The descriptive outcomes are significant in providing the description of the population features without making any reference. Inferential statistics were in the form of panel analysis with structural breaks/event analysis, to explore the effect of credit scoring and interest rates levied on financial performance of tier III commercial banks prior and during the risk-based lending period in Kenya. It also sought to establish the effect of bank size on profitability of tier III commercial banks before and after the introduction of risk-based lending in Kenya. The panel analysis allows exclusion of biases in data by controlling heterogeneity thus mitigating errors in a model (Bonhomme & Manresa, 2015). Panel data was analyzed using STATA software. The proposed investigation sought to explore the impacts of interest rates levied as well as credit scoring using structural breaks on tier III banks' financial performance before the advent of risk-based lending (2016-2019) and during the risk-based lending period 2020-2023) in Kenya. The panel regression model prior introduction of risk-based lending (2016-2019) was as:

$$Yit = \beta 0 + \beta 1X1it + \beta 2X2it + \beta 3X3it + D_{01} + \varepsilon$$

Where: Y is the financial performance of tier III banks

$\beta_0$ is the constant

$\beta_1$, $\beta_2$ and $\beta_3$ are the regression slope coefficients

$X_1$ is the credit score of tier III banks

$X_2$ is lending interest rates levied of tier III banks

$X_3$ is bank size of tier III banks

i is the number of tier III banks

t is time variance (2016-2019)

$D_0$ is period before the introduction of risk-based lending in Kenya (2016-2019), $D_1$ is the period after the introduction of risk-based lending in Kenya (2020-2023)

$\varepsilon$ is the error term

### 3.6.1 Diagnostic Tests

The tests are carried out to ascertain the suitability of the data to carry out further analysis. The tests included Hausman tests, test for heteroscedasticity, multicollinearity, autocorrelation as well as normality. To test for normality, the Kolmogorov-Smirnov test was employed. The null hypothesis is that error terms of the data are normally distributed. When the calculated p-value is <0.05, we fail to reject the null hypothesis. Nonetheless, if the p-value is <0.05, the error variation in the dataset is normally distributed. In case of violation of normality tests, non-parametric tests like Spearman rank correlation was used.

Severer multicollinearity magnifies standard errors of the model resulting in incorrect model coefficients (Alin, 2010). Variance inflation factors was adopted to check for collinearity in the dataset. The Variance Inflation Factors >5 implies that multicollinearity is present in the data (Jurczyk, 2009). In the case of severe multicollinearity, this was cured by removing some of the highly correlated independent variables. To check for autocorrelation error terms in data across time, the Durbin-Watson test was employed. Durbin-Watson statistic range between 0 to 4. A value of 2 shows the absence of serial autocorrelation in the data.

Breusch-Pagan-Godfrey test was used to test for heteroscedasticity. It assumed that data have homoscedastic error variance. If tests reveal an error variance in the data is non-homoscedastic then heteroscedasticity exists in the panel data. This can be mitigated by estimating a FGLS model.

This can be proven by computed p-value which when the outcome is <0.05 exhibits the presence of heteroscedasticity and vice versa (Breusch & Pagan, 1980).

Hausman's Test for random and fixed was based on Hausman's (1978) specification of a model.The investigation assumes that the model is a fixed effect model. Upon testing the hypothesis using estimators, a conclusions were drawn whether the model is fixed and if it is not fixed, then the hypothesis was rejected and the study concluded that the random effect model is the appropriate model to determine the relationship of the study variables.

### 3.7 Ethical Issues in Research

To deliver on the demands of the legal and ethical parameters, the researcher sought permission and authority from NACOSTI and the Strathmore University ethics committee to undertake this research. Secondly, the participants were, among other measures, given an introductory letter and given all the details about the research and how the information was used to facilitate informed consent. The study participants were given assurance that the information given was purposely utilized for academic research only and was not used for commercial purposes. Thirdly, the researcher assured the participants of the confidentiality of the information gathered from the banks.

### 3.8 Summary of the chapter

The chapter outlined the methods that this research adopted in answering its objectives. This included research design, philosophy, target population as well as the sampling methods, methods of data collection as well as analyzing data. The chapter further outlined the ways in which the researcher ensured ethical conduct and research quality as well as model validity through diagnostic tests. Furthermore, data analysis techniques and diagnostic tests were discussed. The chapter ended by outlining the ethical issues to be observed during the research.

# CHAPTER FOUR

# DATA ANALYSIS AND PRESENTATION

## 4.1 Introduction

The section presents the analysis of data and the presentation of the outcomes. Secondary data was used in this research and was collected from the financial records and the financial statements of the commercial banks under review. In addition, interview sessions with bank lending officers were conducted for triangulation purposes. The interview session with the banks' lending officers occurred at their places of work after seeking their consent. The purpose was to explore how the performance of tier III commercial banks are influenced by risk-based lending before and after Kenya introduced risk-based lending. The investigation specifically sought to explore the effect of risk-based credit scoring and risk-based interest rates levied as well as the effect of bank size on performance of the banks under review. The analysis results were presented in the form of descriptive and inferential statistics. Descriptive results were presented in the form of the minimum and maximum values of the respective variables as well as their standard deviations and means. Inferential statistics entailed regression and correlation outcomes.

## 4.2 Descriptive Results

The section outlines the descriptive outcomes that were presented in the form of the minimum and maximum values of the respective variables as well as their means and standard deviation. Table 4.1 presents the descriptive results of the study.

**Table 4.1: Descriptive Results**

| | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Financial Performance | 168 | 0.0021437 | 0.00072 | 0.00103 | 0.0038188 |
| Risk-based credit scoring | 168 | 379.5 | 65.9959 | 303 | 549 |
| Risk-based lending interest rate | 168 | 14.767 | 1.980 | 11.79 | 19.69 |
| Bank Size | 168 | 7.169 | 0.826 | 6.006 | 8.686 |

From the results outlined, financial performance was expressed in form of ROA calculated as the ratio of net income to total assets. It had a mean of 0.0021 and an SD of 0.0007. Its minimum and maximum values were 0.00103 and 0.00382 in that order. In addition, risk-based credit scoring had had a mean of 0.379.5 and an SD of 65.996. Its minimum and maximum values were 303 and 549 respectively. The maximum value for risk-based lending interest rate was 19.69 and its minimum value was 11.79. It had a mean of 14.7667 and a respective SD of 1.9798. The maximum value for bank size was 8.6862 and its minimum value was 6.0064. It attracted a mean of 7.1693 and a respective SD of 0.8260.

### 4.3 Correlation Results

Correlation analysis serves to determine direction and strength of relationship between the risk-based lending on the financial performance of tier III commercial banks in Kenya. Correlation outcomes are outlined in Table 4.2.

**Table 4.2: Correlation Results**

| | Financial Performance | Risk-based credit scoring | Risk-based lending interest | Bank Size |
|---|---|---|---|---|
| | | | | |
| Financial Performance | 1 | | | |
| | | | | |
| Risk-based credit scoring | 0.5517 | 1 | | |
| | 0.000 | | | |
| Risk-based lending interest rate | 0.5427 | 0.1987 | 1 | |
| | 0.000 | 0.0098 | | |
| Bank Size | 0.5603 | 0.6958 | 0.1531 | 1 |
| | 0.000 | 0.000 | 0.0476 | |

From the outcomes presented, risk-based credit scoring and financial performance positively and significantly correlated (r=0.5517, p = 000<0.05). An improvement in the risk-based credit scoring of the tier III commercial banks would lead to significant improvement in financial performance. The correlation between risk-based lending interest rate and performance of tier III commercial banks financially was both positive and statistically significant (r=0.5427, p = 000<0.05). An improvement in the risk-based lending interest rate of the tier III commercial banks would lead to significant improvement in financial performance. The correlation between bank size and financial performance was both positive and statistically significant (r=0.5603, p = 000<0.05). Thus, an improvement in the size of the tier III commercial banks would lead to significant improvement in financial performance.

### 4.4 Diagnostic Tests

The tests included Hausman tests, test for heteroscedasticity, multicollinearity, autocorrelation as well as normality. Hausman tests are conducted to determine the suitable model to be adopted whether fixed or random. Ho tested was that the appropriate model for the research was the random effects.

#### 4.4.1 Test for Normality

To test for normality, Skewness and Kurtosis method was employed. The null hypothesis was that error terms of the data arenormally distributed. When the calculated p-value is <0.05, we fail to reject the null hypothesis. Nonetheless, if the p-value is <0.05, the error variation in the dataset follows a normal distribution. The normality outcomes are outlined in Table 4.3.

**Table 4.3: Normality test results.**

| | Obs | Pr(Skewness) | Pr(Kurtosis) adj | chi2(2) | Prob>chi2 |
|---|---|---|---|---|---|
| Return on Assets | 168 | 0.633 | 0.374 | 1.128 | 0.362 |
| Risk-based credit scoring | 168 | 0.452 | 0.701 | 0.554 | 0.118 |
| Risk-based lending interest rate | 168 | 0.001 | 0.012 | 38.514 | 0.087 |
| Bank size | 168 | 0.067 | 0.009 | 13.689 | 0.102 |

From the outcomes, the calculated p values are >0.05 for the variables under review (0.362>0.05, 0.118>0.05, 0.087>0.05 and 0.102>0.05). These findings point out that the data follows normal distribution and hence the estimation of the panel model can be done.

### 4.4.2 Test for Multicollinearity

Severer multicollinearity magnifies standard errors of the model resulting in incorrect model coefficients (Alin, 2010). Variance inflation factors was adopted to check for collinearity in the dataset. The Variance Inflation Factors >5 implies that multicollinearity is present in the data (Jurczyk, 2009). In the case of severe multicollinearity, this would be cured by removing some of thehighly correlated independent variables. Table 4.4 presents the multicollinearity test outcomes.

**Table 4.4: Multicollinearity Test Results**

| Variable | VIF | 1/VIF |
|---|---|---|
| Risk-based credit scoring | 1.97 | 0.507218 |
| Bank Size | 1.94 | 0.515691 |
| Risk-based lending interest rate | 1.04 | 0.960087 |
| Mean VIF | 1.65 | |



The outcomes outlined point out of the absence of multicollinearity among the variables in the study as the variance inflation factor figures are <5 (1.97<5, 1.94<5, 1.05<5). This implies that the data is suitable for further analysis.

### 4.4.3 Test for Autocorrelation

To check for autocorrelation error terms in data across time, Wooldridge test for autocorrelation in panel data was employed. The decision rule was that is the calculated significance value was >0.05, then the conclusion would be the absence of autocorrelation in the data an implication that the data is suitable to conduct further analysis.

**Table 4.5: Autocorrelation results**

| Wooldridge test for autocorrelation |
|---|
| $H_0$: no first-order autocorrelation |
| F(3, 157) = 1.731 |
| Prob F = 0.1504 |

The investigation failed to reject the null hypothesis that first order autocorrelation is absent in the data as the F test outcome was 1.731 and the p value was 0.1504 > 0.05. The outcomes thus indicate absence of autocorrelation in the data an implication that the data is suitable to conduct further analysis.

### 4.4.4 Test for Heteroscedasticity

Heteroscedasticity was tested using Breusch-Pagan-Godfrey test. It assumes that data have homoscedastic error variance. If tests reveal an error variance in the data is non-homoscedastic then heteroscedasticity exists in the panel data and can be mitigated by estimating a FGLS model. This can be proven by computed p-value which when the outcome is <0.05 exhibits the presence of heteroscedasticity and vice versa (Breusch & Pagan, 1980).

**Table 4.6: Results for Heteroscedasticity test**

| Breusch-Pagan / Cook-Weisberg test for heteroskedasticity |
|---|
| Ho: Constant Variance |
| Variables: Fitted values for ROA |
| chi2(1) = 1.77 |
| Prob > chi2 = 0.1854 |

From the outcomes, the estimated p value was 0.1854>0.05 implying of the absence of heteroscedasticity.

### 4.4.5 Hausman Specification Test

Hausman's Test for random and fixed was based on Hausman's (1978) specification of a model.The investigation assumes that the model is a fixed effect model. Upon testing the hypothesis using estimators, a conclusion was drawn whether the model is fixed and if it is not fixed, then the hypothesis was rejected and the study concluded that the random effect model is the appropriate model to determine the relationship of the study variables.

$H_0$: Random effect is appropriate

$H_a$: Fixed effect is appropriate

**Table 4.7: Hausman Test Results**

| | (b) | (B) | (b-B) | sqrt(diag(V_b-V_B)) |
|---|---|---|---|---|
| | fe | re | Difference | S.E. |
| Risk-based credit scoring | 0.0000029 | 0.0000028 | 0.000000057 | 0.00000024 |
| Risk-based lending interest rate | 0.000162 | 0.0001614 | 0.00000069 | 0.0000038 |
| Bank Size | 0.00029 | 0.0002905 | -0.0000007 | 0.000015 |
| chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B) | 0.16 | | | |
| Prob>chi2 | 0.9845 | | | |

From the outcomes, a chi2(3) value of 0.16 and a respective significance value of 0.9845 > 0.05 implies that the null hypothesis is rejected and a conclusion made that the random effects model is suitable (Konstantopoulos & Hedges, 2019).

### 4.5 Multiple Regression Analysis

Regression analysis serves to explore the linear association between the dependent and the independent variables in the study. Financial performance of the banks under review formed the dependent variable whereas risk-based credit scoring, risk-based lending interest rate and were the independent variables.

#### 4.5.1 Effect of Risk-Based Credit Scoring and Risk-Based Lending Interest Rate on Financial Performance between 2016 and 2019

The section outlines the regression analysis between the dependent variable (financial performance of Tier III commercial banks) and the independent variables (risk-based credit scoring, and risk-based lending interest rate). Regression analysis serves to explore the linear association between the dependent and the independent variables in the study before the introduction of the risk based lending. Table 4.8 presents the multiple regression results for risk-based credit scoring and risk-based lending interest rate on financial performance of tier III banks before the introduction of risk based lending.

**Table 4.8: Multiple Regression Results for Risk-Based Credit Scoring and Risk-Based Lending Interest Rate on financial performance of tier III banks before the introduction of risk based lending.**

| Financial Performance (ROA) | Coef. | Std. Err. | t | P>t | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| Risk-Based Credit Scoring | 0.0000073 | 0.0000012 | 6.76 | 0.000 | 0.0000051 | 0.0000094 |
| Risk-Based Lending Interest Rate | 0.000205 | 0.0000319 | 6.41 | 0.000 | 0.000141 | 0.000268 |
| _cons | -0.000573 | 0.0004166 | -1.38 | 0.173 | -0.0014021 | 0.0002554 |
| R-Squared | 0.3581 | | | | | |
| Adj R-Squared | 0.3503 | | | | | |
| F(1,82) | 45.75 | | | | | |
| P>F | 0.0000 | | | | | |

The study purposed to explore the effect of risk-based credit scoring on the Tier III Kenyan commercial banks financial performance prior the introduction of risk based lending. Secondary

data was used in the investigation and was gathered using the secondary template attached in Appendix II. The outcomes from the analysis were compared with the critical values. The estimated F values were compared with the critical F values in the F tables whereas the significance values estimated were compared with the critical p value (0.05). This rule of thumb was essential in determining the significance of the individual variables (Stang & Kowall, 2020). From the linear regression analysis results, the R Squared for the estimated model was 0.3581 implying that risk-based credit scoring explain to a tune of 35.81 percent of the total variations in the financial performance of tier III commercial banks between 2016 and 2019 before Kenya introduced risk-based lending. Thus, risk-based credit scoring is important in explaining the changes in financial performance. In addition, the estimated model was significant statistically as provided by the estimated p value (0.000<0.05) and the estimated value of F (45.75) greater than the critical F value F(1,82)=2.74781 from the F tables.

The coefficient of risk-based credit scoring was positive 0.0000073 and statistically significant (p=0.000<0.05) implying that a unit improvement in risk-based credit scoring would lead to 0.0000073 units significant improvement in the financial performance. Thus, risk-based credit scoring is a significant determinant of the changes in the performance of the banks under review. In an interview with one of the lending officers, the respondent indicated, "*The implementation of risk-based lending has significantly improved our credit scoring mechanisms. By tailoring interest rates based on individual risk profiles, we've observed a more accurate assessment of borrowers' creditworthiness, leading to fairer interest rate structures*."

The coefficient of risk-based lending interest rate was positive 0.000205 and statistically significant 0.000 < 0.05) implying that a unit improvement in risk-based lending interest rate would lead to 0.0000205 units significant improvement in the performance of tier III commercial banks. Thus, risk-based lending interest rate significantly determines the changes in the commercial bank performance. In an interview with one of the lending officers, the respondent indicated, "*Since adopting Risk based lending we have Higher-risk borrowers are typically charged higher interest rates to compensate for the increased likelihood of default. Conversely, lower-risk borrowers may receive lower interest rates as an incentive to borrow and to reflect the reduced risk to the lender*."

### 4.5.2 Effect of Risk-Based Credit Scoring and Risk-Based Lending Interest Rate on Financial Performance of Tier III Commercial Banks in Kenya between 2020 and 2023 (after the introduction of risk based lending)

The section outlines the multiple regression analysis between the dependent variable (financial performance of Tier III commercial banks) and the independent variables (risk-based credit scoring, and risk-based lending interest rate). This section explored the effect of risk-based credit scoring, and risk-based lending interest rate on financial performance of Tier III commercial banks after the introduction of risk based lending.

**Table 4.9: Regression Results for Risk-Based Credit Scoring and Risk-Based Lending Interest Rate on financial performance of tier III banks after the introduction of risk based lending**

| Financial Performance (ROA) | Coef. | Std. Err. | t | P>t | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| Risk-Based Credit Scoring | 0.0000077 | 0.0000011 | 7.15 | 0.000 | 0.0000056 | 0.0000098 |
| Risk-Based Lending Interest Rate | 0.000188 | 0.0000353 | 5.32 | 0.000 | 0.0001177 | 0.0002582 |
| _cons | -0.00067 | 0.0004013 | -1.67 | 0.099 | -0.0014684 | 0.0001285 |
| R-Squared | 0.3840 | | | | | |
| Adj R-Squared | 0.3764 | | | | | |
| F(1,82) | 51.11 | | | | | |
| P>F | 0.0000 | | | | | |

The objective was to explore the effect of Risk-based credit scoring on the financial performance of Tier III commercial banks in Kenya. Secondary data was used in the investigation and was collected using the secondary template attached in Appendix II. The outcomes from the analysis were compared with the critical values. The estimated F values were compared with the critical F values in the F tables whereas the significance values estimated were compared with the critical p value (0.05). This rule of thumb was essential in determining the significance of the individual variables (Stang & Kowall, 2020). From the linear regression analysis results, the R Squared for the estimated model was 0.3581 implying that risk-based credit scoring explain to a tune of 38.4 percent of the total variations in the financial performance of tier III commercial banks between 2020 and 2023 before Kenya introduced risk-based lending. Thus, risk-based credit scoring is important in explaining the changes in financial performance. In addition, the estimated model was significant statistically as provided by the estimated significance value (0.000<0.05) and the estimated value of F (45.75) greater than the critical F value F(1,82)=2.74781 from the F tables.

The coefficient of risk-based credit scoring was positive 0.0000077 and statistically significant (p=0.000<0.05) implying that a unit improvement in risk-based credit scoring would yield 0.0000077 units significant improvement in the performance of tier III commercial banks. Thus, risk-based credit scoring is a significant determinant of the changes in the performance of Kenyan tier III commercial banking institutions. In an interview with one of the lending officers, the respondent indicated, "*Risk-based lending has positively influenced customer borrowing behaviour. With personalized interest rates reflecting their risk profiles, borrowers are more inclined to maintain favourable credit behaviours to access better loan terms. This has fostered a culture of responsible borrowing and improved overall loan repayment behaviour*".

Risk-based lending interest rate had a positive and significant coefficient (r = 0.000188, 0.000<0.05) implying that a unit improvement in risk-based lending interest rate would lead to 0.0000188 units significant improvement in the performance of the tier III commercial banks. Thus, risk-based lending interest rate significantly determines the variations in the performance of commercial banks under study. In an interview with one of the lending officers, the respondent indicated, "*The implementation of risk-based lending has had a positive impact on interest income for tier III banks. By customizing interest rates based on individual risk assessments, we have optimized interest income generation while effectively managing credit risk. This targeted approach has resulted in a more robust interest income stream for our bank.*"

In summary, upon the introduction of risk-based lending, there was an improvement in the net effect of risk-based credit scoring on the performance of the Kenyan tier III commercial banks financially. However, upon the introduction of risk-based lending, there was a decline in the net effect of risk-based lending interest rate on the tier III commercial banks performance.

### 4.5.3 Effect of Risk-Based Credit Scoring, Risk-Based Lending Interest Rate and Bank size on Financial Performance of Tier III Commercial Banks

The section outlines the regression results of the effect of risk based lending and bank size on bank performance. The results are presented in Table 4.10.

**Table 4.10: Regression Results of Risk-Based Lending and Bank Size on Bank Financial Performance**

| ROA | Coef. | Std. Err. | z | P>z | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| Bank average Credit score | 0.0000059 | 0.0000006 | 9.43 | 0.000 | 0.0000047 | 0.000007 |
| Average lending interest rate | 0.000031 | 0.000013 | 2.4 | 0.016 | 0.000006 | 0.00006 |
| Bank Size | 0.00035 | 0.00005 | 6.98 | 0.000 | 0.00025 | 0.00045 |
| _cons | -0.0031 | 0.0003 | -10.05 | 0.000 | -0.0036 | -0.0025 |
| Wald Chi2(2) | 616.87 | | | | | |
| p > F | 0.000 | | | | | |
| R Squared | 0.7900 | | | | | |

From the results, the estimated R Squared was 0.79 implying that the variables identified including risk-based credit scoring, risk-based lending interest rate and bank size explain to a tune of 79 percent of the total changes in the commercial bank performance between 2020 and 2023 post the advent of risk-based lending in Kenya. Thus, the identified variables are important in giving explanations to the changes in performance financially. In addition, the estimated model was significant statistically as provided by the estimated significance value (0.000<0.05) and the estimated value of wild chi2 value of 616.87. Under the effect of bank size, the R Squared for the model improved from 0.7277 to 0.79 implying that bank size has a significant strengthening effect on the relationship between risk based lending and financial performance of the banks under study.

The coefficient of risk-based credit scoring was positive 0.0000059 and statistically significant (0.000 < 0.05) implying that a unit improvement in risk-based credit scoring would lead to 0.0000059 units significant improvement in the financial performance of the banks under review. Thus, risk-based credit scoring is a significant determinant of the changes in the performance of the tier III Kenyan commercial banks financially.

The coefficient of risk-based lending interest rate was positive 0.000031 and statistically significant (0.016<0.05) implying that a unit improvement in risk-based lending interest rate would result in 0.000031 units significant improvement in the performance of tier III commercial banks. Thus, risk-based lending interest rate is a significant determinant of the changes in the performance of the tier III Kenyan commercial banks financially.

The coefficient of bank size was positive 0.00035 and statistically significant (p=0.000<0.05) implying that a unit improvement in bank size would yield 0.00035 units significant improvement in the performance of the Kenyan commercial banks financially. Thus, bank size is a significant determinant of the variations in the performance of the tier III Kenyan commercial banks financially. Thus, bank size has a significant strengthening effect on the relationship between risk-based lending and the financial performanceof tier III commercial banks. In an interview with one of the lending officers, the respondent indicated, "*The implementation of risk-based lending has had a positive impact on interest income for tier III banks. By customizing interest rates based on individual risk assessments, we have optimized interest income generation while effectively managing credit risk. This targeted approach has resulted in a more robust interest income stream for our bank.*"

### 4.6 Chapter Summary

The chapter presented the descriptive results from the analysis of the secondary data as well as the correlation outcomes. The study further outlined the diagnostic tests that were carried out in the investigation. The study further outlined the regression results for the period 2016 and 2019 and the period between 2020 and 2023. Finally, the chapter presented results on the effect of risk-based lending and bank size on the financial performanceof tier III commercial banks.

# CHAPTER FIVE

# DISCUSSION, CONCLUSION AND RECOMMENDATIONS

## 5.1 Introduction

The section outlines the discussion of the analysis outcomes and presents the conclusions of the study and makes recommendations based on the conclusions. The section outcomes of the discussion of the outcomes in accordance with the objectives of the study. The conclusions of the study are also presented in accordance with the objectives guiding research. The study finally made recommendations to policy, practice and further research.

## 5.2 Discussion on Risk-Based Credit Scoring and Financial Performance

The correlation outcomes indicate that the correlation between risk-based credit scoring and performance of banks was both positive and significant statistically ($r = 0.5517$, $p = 000<0.05$). Regression results before the introduction of risk-based lending in Kenya (2016-2019) indicate that the coefficient of risk-based credit scoring was positive 0.0000073 and statistically significant ($0.000 < 0.05$) implying that a unit improvement in risk-based credit scoring would yield 0.0000073 units significant improvement in the performance of the tier III Kenyan commercial banks financially. Thus, risk-based credit scoring significantly determines the changes in the performance of commercial banks under study. After the advent of risk-based lending in Kenya, (2020-2023), the coefficient of risk-based credit scoring was positive 0.0000077 and statistically significant ($0.000 < 0.05$) implying that a unit improvement in risk-based credit scoring leads to 0.0000077 units significant improvement in the performance of tier III commercial banks. Thus, risk-based credit scoring is a significant determinant of the variations in the performance of the banks financially. This implies that upon the introduction of risk-based lending, there was an improvement in the net impact of risk-based credit scoring on the financial performance of the tier III Kenyan commercial banks. The introduction of risk-based lending enables the banks to identify and classify the borrowers based on their historical credit scores. It may also be an efficient way of determining the loan limits for the different borrowers. In an interview with one of the lending officers, the respondent indicated, "*The impact of risk-based lending on interest income for tier III banks can depend on various factors, including the accuracy of risk assessment models and the bank's ability to manage credit risk effectively. While we have experienced improvements in*

*interest income through more targeted lending practices, we have also faced challenges in balancing risk and return."*

The outcomes are in line with the findings of Nshimiyimana (2023) which found that credit score positively impacts the commercial banks' profitability using ROE. Likewise, the findings of Ndyagyenda (2019) which indicated that strong credit evaluation defines the profitability and survival of the bank of Africa further concur with the outcomes. The findings of Ongeri et al. (2021) further found that credit evaluation significantly affects bank performance in the study locale. Lagat and Bogongo (2023) also established that credit policy, credit standards and credit terms positively affect the profitability of banks in Eldoret.

However, the results do not concur with the findings of Arifaj and Baruti (2023) which indicated that credit risk evaluation was inversely related to bank performance. This could mean that too much credit evaluation may turn away even credit-worthy potential borrowers denying the bank revenue from loans. Furthermore, Das et al. (2017) discovered that Aveny et al. (2019) discovered that credit scoring reduces subjective judgments and possible biases, it significantly increases costs. This is an indication that credit scoring may not necessarily result in increased financial performance in a firm.

The correlation between risk-based lending interest rate and performance of the banks was both positive and significant statistically ($r = 0.5427$, $p = 000<0.05$). The regression results before the introduction of risk-based lending in Kenya (2016-2019) indicate that the coefficient of risk-based lending interest rate was positive 0.000205 and statistically significant ($p = 0.000<0.05$) implying that a unit improvement in risk-based lending interest rate leads to 0.000205 units significant improvement in the financial performance of the banks under study. Thus, risk-based lending interest rate is a significant determinant of the changes in the performance of the tier III Kenyan commercial banks financially. After the introduction of risk-based lending in Kenya, (2020-2023), the coefficient of risk-based lending interest rate was positive 0.000188 and statistically significant ($0.000 < 0.05$) implying that a unit improvement in risk-based lending interest rate results in 0.000188 units significant improvement in the performance of tier III commercial banks. Thus, risk-based lending interest rate significantly determines the changes in the performance of the tier III Kenyan commercial banks financially. This implies that upon the introduction of risk-based lending, there was a decline in the net effect of risk-based lending interest rate on the performance

of tier III commercial banks. In an interview with one of the lending officers, the respondent indicated, *"The effectiveness of risk-based lending in terms of credit scoring varies depending on the bank's approach and the quality of its risk assessment models. As a bank, we have found that tailoring interest rates based on individual risk profiles leads to more accurate credit scoring outcomes. The impact of risk-based lending on financial performance is mixed. While some banks report improvements in profitability due to more targeted lending practices, we experience challenges in managing credit risk effectively."*

The outcomes are in tandem with the findings of Markov et al. (2022) which pointed out that interest rates moderately affect banks' performance. Additionally, the findings concur with Odeke and Odongo (2014) findings that interest rate risk positively affects performance financially. However, the results contrast the findings of Windsor et al. (2023) that showed that interest rate charges reduce banks' net interest margins resulting to performance decline in the banks. In addition, Dondi et al. (2023) further established that lending interest rates substantially and adversely impact bank performance. This is an indication of a gap in practice because risk-based lending was meant to improve bank net interest revenue by levying different interest rates for different customers with different default risk levels. Further, the study by Tiriongo et al. (2023) indicated that deployment of risk-based pricing was heterogeneous and depended on internal policies and bank-specific features but did not establish its impact on bank performance but from the results, the findings support the finding that risk-based pricing affect bank performance.

The correlation between bank size and performance of tier III commercial banks was both positive and significant statistically ($r = 0.5603$, $p = 000<0.05$). The coefficient of bank size was positive 0.00035 and statistically significant ($p=0.000<0.05$) implying that a unit improvement in bank size would yield 0.00035 units significant improvement in the performance of the Kenyan commercial banks financially. Thus, bank size is a significant determinant of the variations in the performance of the tier III Kenyan commercial banks financially. Hence, bank size is a significant determinant of the variations in the performance of the banks under study. This implies that upon the introduction of risk-based lending, there was an improvement in the net impact of the size of the bank on the performance of banks financially in Kenya. In an interview with one of the lending officers, the respondent indicated, "*The size of the bank, particularly in terms of assets, has influence the implementation and effectiveness of risk-based lending to some extent. Larger banks may have more resources and advanced risk assessment tools to implement risk-based lending*

*practices more comprehensively. However, as smaller banks we are leveraging on technology and data analytics to tailor lending decisions, albeit on a smaller scale."*

The outcomes are in line with the findings of Kihuro et al. (2022) which established that bank size significantly affects profitability of banks. Similarly, Konya et al. (2019) further noted that bank size moderates the impact of risk exposure on profitability levels of banks. The findings of Tiriongo et al. (2023) which pointed out that the implementation of risk-based credit pricing would depend on bank size are further in concurrence with the outcomes of the investigation. Hasanov et al. (2019) indicated that bank size significantly and positively affects the performance of banks. Likewise, Kwashie et al. (2022) in Ghana pointed out that the size of bank has significant positive impact on bank financial performance. However, the results do not concur with the findings of Nguyen (2021) which noted that bank size significantly and negatively affects the ROA of banks in Vietnam.

### 5.3 Conclusion

The study concluded that risk-based credit scoring is a significant determinant of the changes in the performance of the tier III Kenyan commercial banks financially. Upon the introduction of risk-based lending, there was a decline in the net effect of risk-based credit scoring on the financial performance of the tier III commercial banks in Kenya. Thus, the introduction of risk-based lending in Kenya may have a net negative impact on the financial performance of Kenyan banks under study. This could mean that too much credit evaluation may turn away even credit-worthy potential borrowers denying the bank revenue from loans. Whereas credit scoring reduces subjective judgments and possible biases, it significantly increases costs. This is an indication that credit scoring may not necessarily result in increased financial performance in a firm. The results of the study validates the propositions of credit risk theory that to reduce cases of borrowers' default,due credit checks about the borrower have to be conducted and pegged on the level of security required to access the credit. High default rates would be associated with high-interest rates.

The study further concluded that risk-based lending interest rate is a significant determinant of the variations in the performance of the Kenyan banks financially. Upon the introduction of risk-based lending, there was a decline in the net effect of risk-based lending interest rate on the performance of Kenya tier III commercial banks financially. The tier III commercial banks in Kenya source

their incomes from the interest chargers from loan borrowers. The introduction of risk-based lending may reduce the number of eligible borrowers thus reducing the interest margins negatively affecting the financial performance of commercial banks under review. Credit pricing in Kenya is affected by credit risk, efficiency, and bank size among others. The deployment of risk-based pricing was heterogeneous and depended on internal policies and bank-specific features. The outcomes validates the propositions of loan pricing theory.

The study finally concluded that the size of the bank is a significant determinant of the variations in the performance of the tier III Kenyan commercial banks financially. Upon the introduction of risk-based lending, there was an improvement in the net impact of the size of the bank on the performance of Kenya tier III commercial banks. Commercial banks with large asset bases are like to have a higher net income compared to the commercial banks with lower asset bases.

### 5.4 Recommendations

The study recommends that the Kenyan tier III commercial banks ought not to focus so much on the credit scores while advancing loans to its customers. Too much credit evaluation may turn away even credit-worthy potential borrowers denying the bank revenue from loans. The banks out to put into consideration other alternatives including advancing loans using collaterals such as title deeds or log books. This would enhance financial performance of the banks, as this would give more customers a chance of borrowing and by extension, more interest incomes to the banks. However, they should not completely do away with using credit scores, as it is essential in knowing customers credit history.

The study further recommends that the tier III Kenyan commercial banks ought not to segregate customers based on the levels of their credit risks. This would have an effect on the financial performance of the commercial banks under review. The customers who are considered credit risk are likely to qualify for lower credit limits and hence even with higher interest rates on loans advanced, the interest incomes would not be significant. In turn, the tier III commercial banks in Kenya ought to introduce a competitive interest rate that would attract more borrowers because when the borrowers have knowledge of the existence of risk-based lending, it may turn away even the credit worth borrowers because of lack of knowledge of lending rates that would base their loans.

Finally, the tier III commercial banks ought to focus on building their asset bases. This would build customer confidence in the banks. More customers would in turn channel more of their investments to the banks. These investments would form a strong capital base for the tier III commercial banks in Kenya. By expanding their asset base, tier III banks will have a robust asset base and increased customer deposits. As such, they can review or adjust their loan pricing models to accommodate the specific needs of its customers who are heterogeneous without necessarily following the pricing models adapted by tier II or I banks that have advantage over tier III in terms of huge asset base, strong credit scoring methods and large customer deposits. Thus, the tier III banks can adopt a flexible pricing of its loans to attract more customers being driven away by too stringent credit scoring techniques being applied by tier I and Tier II banks.

### 5.5 Limitations

The study was limited to the tier III commercial banks operating in Kenya. However, there are other commercial banks operating in Kenya that research can also focus on. Because of the differences in assets bases, customer base, customer characteristics and credit risk evaluation' abilities across banks, it would be more interesting to compare the impact of risk-based lending on financial performance of banks across tier I, tier II and tier III banks in Kenya.

The study was also limited in terms of time scope. The investigation was limited to the period 2016 to 2023, four years before the introduction of risk-based lending and four years after the introduction of risk-based lending (2019 to 2023). Thus, the study may have encountered methodological limitation while studying the effect of risk-based lending on the financial performance of the tier III commercial banks. Risk based lending was introduced in Kenya in 2019 by CBK and the policy has only been in operational for four years. An expanded time scope, would have been more appropriate to explain the impact of this policy intervention in the Kenyan banking sector. Finally, the performance of banks is affected by other multitude of factors like capital adequacy, leverage, asset quality, liquidity, customer size, management efficiency among other factors. Thus, dwindling financial performance of tier III banks cannot only be linked to credit scoring, interest rate and bank size.

## 5.6 Suggestions for Further Research

This research was limited to the tier III commercial banks operating in Kenya. Banks in kenya categorized into tier I, II and Tier III experience unique differences in terms of assets bases, customer base, customer characteristics and credit risk evaluation' abilities across banks. Further comparative studies is essential to compare the impact of risk-based lending on financial performance of banks across tier I, tier II and tier III banks in Kenya.

The study was also limited in time of time scope. It was an event study covering the period 2016-2019 (before introduction of risk based lending) and period 2020-2023 (during risk based lending). Risk based lending was introduced in Kenya in 2019 by CBK and the policy has only been in operational for some few years. An expanded time scope would be appropriate to explain the impact of this policy intervention in the Kenyan banking sector. Once the policy has existed for at least 5-10 years, further research may be undertaken to ascertain the impact of the CBK policy o risk based lending on bank financial performance.

Finally, the performance of banks is affected by other like capital adequacy, leverage, asset quality, liquidity, customer size, management efficiency among other factors. This is an indication that the financial performance of tier III banks cannot only be linked to credit scoring, interest rate and bank size but also other bank internal and external factors. Future studies may incorporate these factors into the model as other variables.

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## APPENDICES

### Appendix I: Introduction Letter

Jenipher Dola

Strathmore University-Kenya

P.O. Box 59857, 00200, City Square

Nairobi 01/02/2024

Dear Sir/ Madam,

Re: Request for Participation in Research

I am a student at Strathmore University-Kenya, pursuing a Master of Commerce in Finance Degree. I am currently conducting a study to investigate the effect of risk-based lending on the financial performance of tier III commercial banks before and after the introduction of risk-based lending in Kenya.

The data to be collected will be useful in this study as part of the MCOM degree requirements. Please note that the information gathered is strictly for academic purposes only and will not be used to malign any bank or promote another one.

Your cooperation will be highly appreciated.

Yours Sincerely,Jenipher Dola

**Appendix II: Secondary Data Collection Sheet**

| Year | Bank | Bank average Credit scoreusing FICO | Average lending interest rate in percent | Bank size in KES (totalasset) | ROA in percentage |
|---|---|---|---|---|---|
| 2016 | | | | | |
| 2017 | | | | | |
| 2018 | | | | | |
| 2019 | | | | | |
| 2020 | | | | | |
| 2021 | | | | | |
| 2022 | | | | | |
| 2023 | | | | | |

**Appendix III: Interview guide for Lending Officers**

The interview guide is meant to collect data on matters pertaining risk-based lending, operations of the risk-based lending initiate and how it has impacted performance of the tier III banks, customer borrowing behavior and interest income of the tier III banks. The interview will take approximately 20-30 minutes. The responses from the interview will be confidential and will only be used for purposes of academic research only.

Interviewee code_____ Date __

How would you rate the effectiveness of risk-based lending in terms of credit scoring?

a) Interest rate levied

How has risk-based lending impacted the borrowing behaviour of the customers

With risk-based lending, how has it has impacted interest income of the tier III banks?

How has the size of the bank in terms of assets influence the implementation andeffectiveness of the risk-based lending initiative among the tier III banks?

Thank you for participating

**Appendix IV: List of Tier III Banks in Kenya**

| |
|---|
| HFC Limited |
| Sidian Bank Limited |
| SBM Bank (Kenya) Ltd. |
| Kingdom Bank Limited |
| Access Bank (Kenya) PLC |
| Gulf African Bank Ltd |
| First Community Bank Ltd |
| Consolidated Bank of Kenya Ltd |
| Credit Bank Plc |
| African Banking Corporation Ltd |
| Spire Bank Limited |
| Guaranty Trust Bank (Kenya) Ltd |
| Guardian Bank Limited |
| Paramount Bank Ltd |
| UBA Kenya Bank Ltd |
| M-Oriental Bank Ltd |
| DIB Bank Kenya Ltd |
| Habib Bank A.G. Zurich |
| Middle East Bank Ltd |
| Victoria Commercial Bank Plc |
| Mayfair CIB Bank Ltd |
| Development Bank of Kenya Ltd |

Source: CBK 2022

## Appendix V: SU-ISERC Ethics Letter

Strathmore UNIVERSITY

**12th April 2024**

Ms Dola Jenipher,
jenipher.dola@strathmore.edu

Dear Ms Dola,

**RE: Effect of Risk-based Lending on the Financial Performance of Tier III Commercial Banks in Kenya**

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU-masters** research proposal. Your application reference number is **SU-ISERC2192/24.** The approval period is from **12th April 2024 to 11th April 2025.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 72 hours of notification.
iv. Any changes anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 72 hours.
v. Clearance for the export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.

Before commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and obtain other clearances needed.

Yours sincerely,

**Mr Ambrose Rachier,**
**Chairperson; SU-ISERC**

STRATHMORE UNIVERSITY INSTITUTIONAL SCIENTIFIC AND ETHICAL REVIEW COMMITTEE
(SU-ISERC)
12-Apr-2024
Email:ethicsreview@strathmore.edu
P.O BOX 59857-00200
NAIROBI-KENYA

## Appendix VI: NACOSTI Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **935200**

Date of Issue: **18/April/2024**

**RESEARCH LICENSE**

**This is to Certify that Miss.. Jenipher Anyango Dola of Strathmore University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: Effect Of Risk-Based Lending On The Financial Performance Of Tier III Commercial Banks In Kenya for the period ending : 18/April/2025.**

License No: **NACOSTI/P/24/34803**

**935200**

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

**See overleaf for conditions**

**THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)**

Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

**The National Commission for Science, Technology and Innovation**, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

**CONDITIONS OF THE RESEARCH LICENSE**

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and Innovation(NACOSTI),
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