

**THE EFFECT OF SELECTED INTEREST RATE DETERMINANTS
ON THE QUALITY OF CREDIT PORTFOLIO OFFERED BY
LISTED COMMERCIAL BANKS IN KENYA**

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DECLARATION

I declare that this research project is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

Signed:  Date: 17.11.2022

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This Research Project has been submitted for examination with my approval as the University of Nairobi Supervisor.

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DEDICATION

To my family, for their unconditional support throughout the study period and for showing me that everything is possible through work and effort, and for helping me live my dream

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ABBREVIATIONS AND ACRONYMS

BOPO	Operating Expense to Operating Income ratio
CBK	Central Bank of Kenya.
NPA	Non-performing Assets
NPLs	Non-performing Loans
ROE	Return on Equity

ABSTRACT

Commercial banks' capacity to advance sustainable loans to their clients depends on the quality of their credit portfolio. While monitoring the quality of a commercial bank's credit portfolio continues to be challenging, the performance of most commercial banks globally depends on how well they manage their biggest asset-loans. The quality of the credit portfolio that commercial banks offer is influenced by factors such as interest rates. The objective of the study was to determine the effect of selected interest rate determinants on the quality of credit portfolio offered by listed commercial banks in Kenya. The study used the cost of borrowing, capital adequacy and BOPO (operating cost to income ratio) as the independent variable while credit portfolio quality as the dependent variable. The study employed descriptive research design to establish if there is a statistical link or correlation between variables with little or no effort to control extraneous variables. Twelve listed commercial banks formed the population sample, but data was only available for 11 banks. Correlation analysis revealed a positive and strong correlation between the operational cost to income (BOPO) and credit portfolio quality. At the same time, the findings indicated a strong negative correlation between capital adequacy and credit portfolio quality. Interest rate (cost of borrowing) had a positive but weak correlation with the quality of the credit portfolio. The regression results show that interest rates have no significant effect on the credit portfolio quality, while BOPO and capital adequacy significantly affect the credit portfolio quality. BOPO and capital adequacy also exhibited positive and negative relationships with the credit portfolio quality, respectively. The findings also indicated that the independent variables explained 51.5% of variations in the quality of the credit portfolio. The regression model was also fit since the p-value was 0.00. It is therefore recommended that banks raise their core capital base since the capital adequacy measure revealed that banks with high capital improve the quality of their credit portfolio. Further, banks need to maximize operating income to keep their BOPO ratio within manageable limits.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The financial crisis of 2008 destabilized banks and triggered an increase in the number of non-performing loans (NPLs). Following that, the portfolio quality of banks gradually deteriorated. Central banks globally responded swiftly to deal with impaired bank assets, recapitalization, and restructuring of insolvent banks (Avgouleas & Goodhart, 2016). At the institutional level, many NPLs increased concerns about the banks' business model's viability and resilience in the face of future downturns, raising concerns about future profitability and asset values (European Commission, 2009). The critical observation is that the quality of the credit portfolio (NPLs) performance is driven by the determinants of interest rates, i.e., cost of borrowing, operating costs, capital adequacy, and investors require compensation for aggregate/undiversifiable risk (Agoraki, Delis & Pasiouras, 2012).

The Keynes' liquidity theory, and the loanable funds theory will guide the study. The Keynes liquidity theory discusses how the capital adequacy ratio of banks is linked to the quality of their credit portfolio. The primary interest rate factors are market forces for money demand and supply. On the other hand, the loanable funds theory, postulates that market actors (lenders and borrowers) have no impact on loan pricing. As a result, there is only one rate of interest in the market at any one time.

There is a general belief that Kenyan banks have unjustifiably increased their margins by failing to shift the decreases in their operating and funding costs to borrowers. The yearly interest rate for Kenya's top 5 costliest banks ranges from 13.8% to 14.5% on average for the various types of loans issued. It is almost 7% more than the average yearly rate in South Africa and 11.2% higher than the average annual rate in the USA (Cytonn, 2022). Due to this upheaval, borrowers now pay exorbitant borrowing fees; thus, when they cannot make payments on their loans, the bank's non-performing loans rise, lowering the quality of their credit portfolio. In Kenya, the banking sector's NPL ratio increased to 14.0 per cent in 2022 from the recorded 13.1 per cent in December 2021 (CBK, 2022).

1.1.1 Determinants of Interest Rates

The interest rate represents the fees that financial institutions charge on borrowed funds. This fee rate depends on the borrower's credit ratings, rate of inflation, and the time value of money (Dupas, Keats & Robinson, 2019). Negele (2013) notes that interest rate represents compensation for credit risk since lenders demand payment to supply the capital to borrowers over a set period. Banks' interest rate settings can be divided into two categories: microeconomic factors and macroeconomic factors (Samahiya & Kaakunga, 2014). Micro-economic variables include the cost of borrowing and savings, operational expenses, and capital adequacy. At the macroeconomic level, however, significant determinants include the inflation rate, exchange rate volatility, public sector borrowing from commercial banks, budget deficit, and the rate of economic growth (Bhattarai, 2015).

Bank operational costs refer to the expenses related to the bank's daily operations, such as maintenance and administration. Simpasa (2014) concluded from his research that factors linked to bank operational costs significantly impact lending rates. The author further contended that certain aspects of a financial institution's balance sheet suggest that high-cost structures or low-income issues significantly impact lending rates.

Capital reserves are primarily utilized as a contingency fund to protect against predicted losses from poor and questionable debts. According to Gallati (2022), capital adequacy rules can function as a deterrent to taking exceptional risks if the amount of capital set aside is correlated with the degree of risk taken. Olalekan and Adeyinka (2013) note that capital adequacy helps mitigate losses when losses are unusually high. It assures the stakeholders, clients, and regulatory authorities that the bank will continue to be financially viable. According to policymakers, banks are more likely to increase their lending rates hastily when market interest rates are rising than to lower them when market rates are falling (Dupas, Keats & Robinson, 2019). Given that these factors are the primary influences on interest rates in Kenya, this study will concentrate on the cost of borrowing, capital adequacy, and operational costs.

1.1.2 Quality of the Credit Portfolio

A credit portfolio comprises credit exposures intended to be used in financial intermediation activities such as routine loan operations, derivatives contracts, or investments in high credit risk sensitive products such as corporate bonds (Wood & Skinner, 2018). A bank's lending loan book is the most significant asset and its major revenue source. It poses huge threats to the financial stability of a bank. The level of interest rate risk associated with a bank's lending activity is determined by its credit portfolio structure and the extent to which loan parameters such as the rate of interest, term of the loan, and inflation rate expose the core bank's revenue stream to interest rate fluctuations (Tsintsadze, Oniani, & Ghoghoberidze, 2018).

Commercial banks primarily direct their efforts on lending because interest income from loans accounts for a large portion of the bank's earnings (Bhattarai, 2015). Possessing a high-quality loan portfolio is a critical asset since it is positively linked with the bank's performance. Nevertheless, some loans underperform, resulting in bad debts that hurt the banks' core earnings. These bad debts are a burden to financial institutions because of their impact on the quality of the assets and the overall net earnings of the banks: They compel financial institutions to have provisions for non-performing loans and unrecoverable debts that lowers their loans (Dupas Keats & Robinson, 2019).

Loan loss provision represents an expense charged in the income statement, while loan loss reserves appear on the balance sheet as a provision. The difference in increases or decreases in the loan loss reserve is charged to the income statement. The loan loss reserves ratio assesses the credit portfolio's soundness and is used to protect banks from unexpected losses or shocks (Ozili & Outa, 2017). Ahmed, Mohammed, and Adisa (2014) contend that loan loss provisions are used to cover anticipated future losses if borrowers' default on their payments. In contrast, loan loss reserves accumulate yearly net provisions over time that indicate real projected loan losses. As a result, the loan loss reserve is inextricably tied to a bank's credit portfolio quality (Ahmed, Mohammed & Adisa, 2014).

1.1.3 Interest Rate Determinants and the Quality of the Credit Portfolio

Bahrudin and Masih (2018) contend that the interest rate determinant of lending rate has no relationship with the credit portfolio quality as measured by NPLs. The authors suggest that several banks may have similar lending rates, but their credit portfolio quality may still differ. They argue that some banks' portfolios may consist of a significant number of non-performing loans due to poor credit management. Other banks' loan portfolios may be healthy due to their loan portfolio being highly diversified, thus allowing them to offer lenient credit terms while maintaining a low overall risk (Bahrudin & Masih, 2018). Additionally, some banks may have been ready to take a chance on loans with a high default risk due to their tendency to be high-risk takers.

Furthermore, the banks may be asymmetrical since the spread between the borrowing rate and lending rates depends on the credit risk, liquid assets, operating expenses, and the banks' profitability margins. The lending rate for each bank varies based on how efficiently they lend money. To remain competitive, certain banks can give consumers reduced lending rates even though they have greater borrowing rates (Bahrudin & Masih, 2018).

Chiesa and Mansilla-Fernández (2018) argue that banks can reduce the likelihood of their credit portfolio quality deteriorating or customers defaulting by limiting risk-taking through minimal lending and liquidity creation or raising their capital reserves via equity issuance. The authors further contend that if the bank's cost of capital rises significantly, the bank is unlikely to originate new lending or change maturities. Bouwman and Malmendier (2015) demonstrate that bank managers would be inclined to raise the riskiness of their portfolios to generate more earnings. As a result, they will be more likely to give credit to uncreditworthy borrowers, leading to a rise in NPLs. In other words, because NPLs beyond a certain threshold may motivate banks to shift risk, banks' quality portfolios may endogenously produce more risk-taking.

1.1.4 Listed Commercial Banks in Kenya

The Kenyan banking sector consisted of 38 financial institutions as of December 31, 2021, with the CBK serving as the regulatory body. 36 of the 38 banking institutions were privately owned, while the Kenyan government owned two banks (CBK, 2021).

There 38 commercial banks, however, only 12 banks are listed at the NSE (NSE, 2022). The CBK regulates banks in Kenya through the Banking Act, the CBK Act, and the Companies Act. Commercial banks also adhere to sectoral regulations, such as those promulgated by the Kenya Bankers Association.

The banking industry in Kenya performed relatively poorly for the financial year ended December 2020. The EBIT declined by 29.3% to a hundred and twelve billion from one hundred and fifty-nine billion in 2019 (CBK, 2021). The decreasing profits were driven by lower income (7.3%) and increasing total expenses (22.6%) (CBK, 2021). A 17.2 percent increase in loan loss provisions was primarily responsible for the larger increase in overall expenses (CBK, 2021), a revelation of the poor quality of the credit portfolios in Kenya's banks. Thus, commercial banks were forced to make adequate provisions for the loans to mitigate risk of default. This results in lost income due to the opportunity cost of lost investments.

1.2 Research Problem

Borrowers may find difficulties servicing debt as interest rate increases because the debt becomes expensive. Consequently, they default and adversely affect the quality of the bank's credit portfolio. In contrast, NPLs are reduced by lowering the interest rate, and as a result, bank profits also decline (Altavilla, Boucinha, & Peydro, 2018). Banks are thought to effectively manage their operating costs when they reduce costs to monitor loan risks. Still, the potential for rising NPLs becomes inevitable (Ozili, 2019). On the other hand, it is considered poor management if banks spend more money to reduce lending risk but cannot control NPLs because of their lack of managerial capabilities (Ozili, 2019).

The level of non-performing loans in Kenya's commercial banks has increased over the years (CBK, 2022). This trend points to either a high-interest rate by the individual banks and or lenient credit risk management. The average annual interest rate for the various types of loans given by Kenya's top 5 priciest banks ranges from 13.8 percent to 14.5 percent (Cytonn, 2022). The high-interest rate charged by the banks in Kenya caused a slight increase in the amount of non-performing loans they reported.

Bhattarai (2015) conducts a study on determining interest rate factors in banks in Nepalese. This study presents a conceptual gap as the effect of interest rate determinants on credit portfolio quality was not established. Loh et al. (2015) studied the association between the level of NPLs at Malaysian banks and macro-economic variables. The study has a conceptual gap because it did not investigate the variables of operating expenses and capital adequacy. Albra, Syamni, and Habibie (2020) examined the influence of macro- and microeconomic factors on the NPLs among Indonesian Sharia banks. In contrast to the current study, which will concentrate on Sharia-compliant and non-Sharia banks, the study indicates a contextual gap. Kamran et al. (2016) focused on risk premium and bank NPLs in 8 European banks. Since the economic environment of developed countries differs from that of a developing country like Kenya, the study has a contextual gap. There is also a conceptual gap as the study focused on risk premium.

Locally, Onyango (2017) investigated how Kenyan commercial banks' loan portfolio quality was affected by credit risk management. The study has a conceptual gap because it addressed credit risk management, not interest rate determinants. Masavu (2015) examined the impact of NPLs on banks' interest income. Since interest income rather than factors affecting interest rates were the main focus, there is a conceptual gap. Kipkemoi (2020) explored macro-economic factors' relationship with microfinance banks' financial performance. The study is contextually distinct because it examined microfinance banks, not commercial banks.

The studies reviewed have shown contextual and conceptual differences. The global studies revealed contextual gaps where some of the studies' target population were Sharia banks, Asian banks, and European banks. They also showed conceptual gaps as they

focused on risk premium and lending interest rates, excluding other vital determinants such as operating costs and capital adequacy. Most local studies on credit portfolio quality focused on other interest rate determinants other than operating expenses and capital adequacy. In addition, the studies are centered on credit management and interest income and not the quality of the credit portfolio. This justifies the need for further research in this field.

1.3 Research Objective

The study aimed to investigate how interest rates determinants influence the quality of credit portfolio offered by listed banks in Kenya.

1.4 Value of the Study

The study findings contribute to developing a predictive tool that aid implementors and policymakers in determining the optimal lending rate level and investors interested in investing in the credit market and commercial banks, particularly on the critical factors that determine their success.

The study's findings help scholars better understand how borrowing costs, operational costs, and capital adequacy affect the quality of the banks' credit portfolios while also allowing them to spot potential areas for further investigation. The study also contributes knowledge for academics studying credit portfolios and future researchers on pertinent topics.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The section discusses the theories of the study, factors determining the quality of the credit portfolio, covers the empirical literature on the topic, presents the conceptual framework, and concludes with literature review summary and gaps of the study.

2.2 Theoretical Foundation

There are various theories that endeavor to discuss the association between the study variables. In this study, the Keynes liquidity theory and the loanable funds theory will be the theories underpinning the study.

2.2.1 Keynes Liquidity Theory

The theory emphasizes market forces as the primary interest rate determinant. It also postulates that the supply and demand for money determine the market interest rate which can be described as the price at which holding money balances against its supply (Appelt, 2016). Despite these flaws and limitations, it has been utilized to assist Huang's (2015) research on policy consequences such as raising the interest rates. The theory is pertinent to this study because it emphasizes how CAR impacts the credit portfolio of banks.

Critics of the theory, such as Ohlin (1937), claimed that r is affected by the loanable funds' forces, where demand relates to investment and hoarding cash, and supply relates to savings, dishoarding, and the money held by banks. Despite these flaws and limitations, it has been utilized to assist Huang's (2015) research on policy consequences

such as raising the interest rates. The theory is pertinent to this study because it emphasizes how CAR impacts the credit portfolio of banks.

2.2.2 Loanable Funds Theory

The theory was developed by Ohlin in (1937). Loanable funds refer to all types of loans, bonds, and savings available in the market. According to the loanable funds model, banks are modeled as resource-trading middlemen who accept physical resource deposits from savers before lending them to borrowers (Jakab & Kumhof, 2018). Ultimately, the competing forces in the market equalize the market resulting in an equilibrium rate of interest.

The theory postulates that savings are a form of loan advanced by depositors to banks and that financial institutions must accumulate savings to have funds that they can lend to their borrowers. Thus, banks are acting as simple middlemen between investors (borrowers) and savers (depositors) (Storm, 2017). Thus, banks are not creators of funds and do not invest their own money. Savings, which is a positive function of interest rates, are in contrast to investment, which is a negative function of interest rates (Storm, 2017).

Keynes (1936) critiqued the theory, claiming that it is founded on the unrealistic premise that full employment will occur because of the interdependence between what one saves and what they generate. In this study, it will emphasize the impact of BOPO on the credit portfolio quality given by commercial banks.

2.3 Determinants of the Credit Portfolio Quality

The section discusses the determinants of credit portfolio quality which include; cost of borrowing, capital adequacy and operational costs.

2.3.1 Cost of Borrowing

The cost of borrowing is the amount the borrower pays the lender that does not consider the principal amount to compensate the lenders for parting with their asset. It comprises interest rates and other fees associated with borrowing (Deli et al., 2019). Bahrudin and Masih (2018) findings indicated that the association between borrowings and credit portfolio quality is inconclusive. They argued that increases or decreases in interest rates

due to economic events such as financial crises would result in rising non-performing loans in the short term.

However, in the long haul, NPLs is proportionally correlated with bank loan interest rates. By every means necessary, bank management must keep the NPLs low to prevent a financial collapse. Therefore, risk-averse banks raise interest rates and limit loans to protect themselves from the adverse effects of credit risk (Bahruddin & Masih, 2018).

Messai and Jouini (2013) note that when the interest rate is floating, it also affects the total amount of bad debt. According to the authors, banks should charge borrowers with poor credit scores a higher interest rate to safeguard against non-payment. Since the bank levied the risk premium before downgrading the portfolio, the quality will still decline should the borrower become overdue. By raising the cost of credit and decreasing the loan demand, an increase in interest rates can potentially disrupt banks' activities (Messai & Jouini, 2013).

2.3.2 Capital Adequacy

The needed minimum reserves held by financial institutions to cover debts and protect them from unanticipated events in their daily operations are known as capital adequacy (Bateni, Vakilifard, & Asghari, 2014). It serves as a reserve of contingent money that can be utilized to cover delinquent and bad loans. It has a larger impact on the interest rates they charge in the subsequent periods. Banks are likely to cut down on lending, increase the cost of borrowing, and reduce interest rates on savings to reestablish an appropriate return on their capital base. As banks' resources become increasingly scarce, their potential to increase credit limits decreases (Farhan & Yameen, 2020).

2.3.3 Operational Costs

The operating costs are the expenses that financial institutions incur to provide credit products and services to their clients. These costs are the primary contributor to the cost of borrowing and determine the efficiency of financial institutions in supplying credit to the market (Cazacu & Abdraimov, 2020). The entire cost of operations for delivering credit is influenced by the product portfolio mix of each institution.

Cazacu and Abdraimov (2020) discovered evidence that banks that provide credit to corporate enterprises have a lower operating expense ratio than those that only deliver credit to MFIs and individuals in their research of Ghanaian banks. They contended that the time and resources required for client acquisition, risk analysis, and overall portfolio management are affected by the loan supplied and the efficiency of the procedures.

2.4 Empirical Studies and Knowledge Gaps

The empirical section reviews past global, regional and local studies done that link the study variables.

2.4.1 Global Studies

Chiesa and Mansila-Fernandez (2021) investigated non-performing loans and their link to European capital adequacy and liquidity. The study covered 2001 to 2016. The findings indicated that NPLs increased borrowing costs.

Cazacu and Abdraimov (2020) perform a case study on credit cost in West Africa. The financial institutions consist of banks, credit, and savings microfinance institutions. Three banks formed the sample size in Zambia, while four banks formed the sample size in Ghana. The study covered 2017 to 2018. The authors collected primary data on the cost of credit through interviews, while secondary data is from audited reports. The findings indicated that a high-interest rate (cost of borrowing) resulted in a loss in the studied financial institution's lending activity.

Suardika and Dewi (2021) examined the impact that CAR, and operating costs have on NPLs in Indonesia and covered 2018 to 2020. The authors relied on the questionnaire collection tool. The result indicated that the capital adequacy ratio was negatively linked to the credit portfolio quality while the operating costs were positively linked.

Khan et al. (2015) explored Pakistan's NPLs and lending rates. The study sample consisted of five banks. The study covered 2008 to 2014. Data is collected from audited reports of the banks and performed analysis using regression and correlation. The

established that NPLs and lending rates are positively linked.

Makri, Tsagkanos, and Bellas (2014) explores NPLs factors for 17 banks in the Eurozone. The study employs an econometric model. The authors relied on the questionnaire collection tool. The findings indicated a direct association between the NPLs factors.

2.4.2 Local Studies

Mecha (2018) researches interest rate capping and loan portfolio performance banks. The author population was 11 listed banks. The study covered 2015 to 2016. The study uses the event methodology and analyzes data using the paired sample test. The findings indicated an inverse relationship between interest rate capping and loan portfolio performance.

Wakaria (2016) links credit risk management to the savings and non-savings MFIs' financial performance in Kenya. The population consisted of 13 MFIs, and the period runs from 2011 to 2015. The study research design was descriptive and collected data from the audited reports of the MFIs. Results findings indicated that credit risks negatively influenced MFIs profits.

Onuko, Muganda, and Musiega (2015) explored the association between credit risk and the credit portfolio quality of tier I banks between 2009 to 2013. The population consisted of five-tier I banks. The study relied on qualitative and quantitative data collection sources. The findings revealed that the cost of borrowing impacted non-performing assets positively.

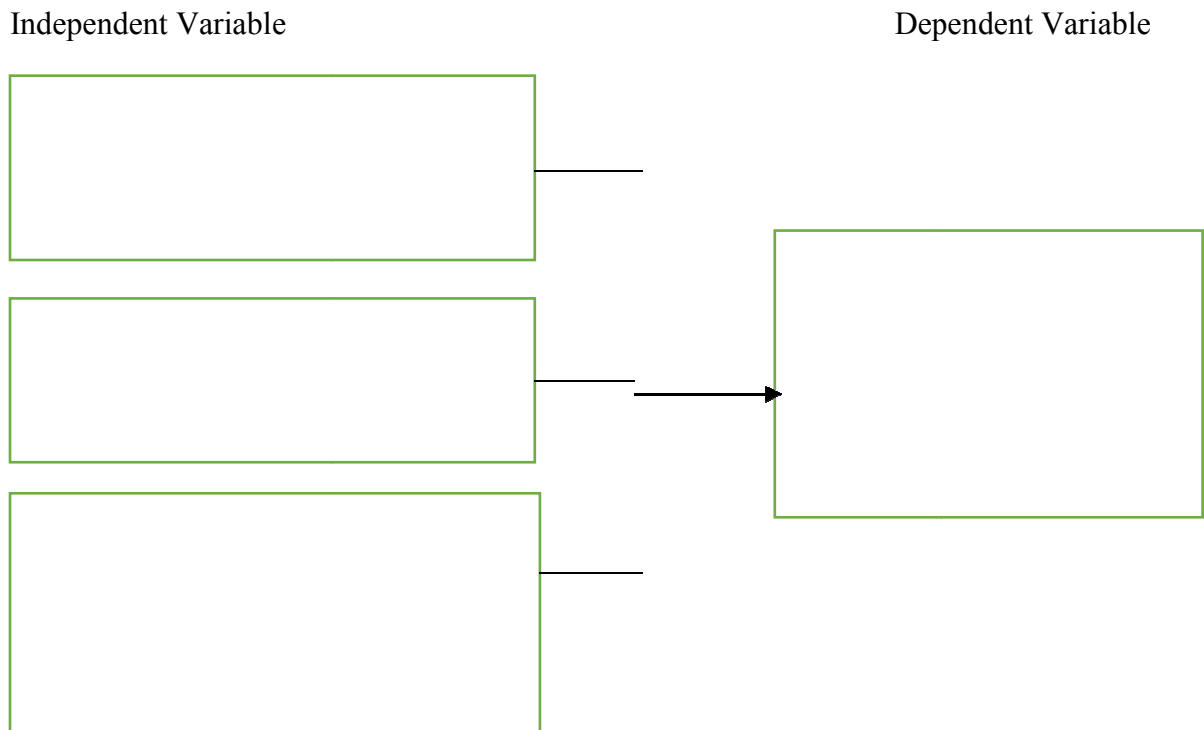
Kananu and Ileri (2015) investigated how operating costs impacted the cost of borrowing from banks. The study consisted of 34 banks, between 2013 - 2015. The author employed the descriptive research design. The authors found a positive association between BOPO and interest rates.

Kiaritha, Gekara, and Mung'atu (2014) explored operating costs and their association with Saccos' financial performance in Kenya. The study selected 1371 SACCOs in

Nairobi County. The authors choose 384 respondents. The study employed the questionnaire research instrument. The findings indicated that operating expense is a high cost that impacts the profitability of SACCOs.

2.5 Conceptual Framework

Figure 1 Conceptual Framework



Source (Author, 2022)

2.6 Summary of the Literature Review

The relevant literature was examined: Liquidity preference theory and the loanable funds' theory. Conceptual gaps arise in Makri, Tsagkanos, and Bellas (2014): Cazacu and Abdaimov (2020), that established the cost of credit and Chiesa and Mansila-Fernandez (2021), who investigated NPLs and liquidity. Contextual gaps arise in Mecha's (2018) study on Saccos, and Kiaritha, Gekara, and Mung'atu (2014) study on SACCOs and for all the global studies conducted in developed nations which have a different economic setting compared to a developing country like Kenya. Methodological gaps also arise as some studies relied on qualitative data collection instruments: Kiaritha, Gekara, and

Mung'atu (2014) used a questionnaire, while Cazacu and Abdraimov (2020) employed interview guides.

Author	Focus of study	Methodology	Findings	Research gap	Focus of the current study
Chiesa and Mansila-Fernandez (2021)	The effect of NPLs loans on capital adequacy and liquidity in European banks.	Study period was 2001 to 2016. The author uses the parametric tests in analysis.	A positive association between capital adequacy and NPLs.	The study focused on banks in the Eurozone and not the local setting, Kenya.	The study will be localized to Kenya.
Cazacu and Abdramov (2020)	A case study on the cost of credit for financial institutions in Zambia and Ghana.	The period is 2017 to 2018 and the author collects both primary and secondary data.	A negative relationship between cost of credit and the quality of the credit portfolio.	The study relied-on questionnaires and not audited reports.	Audited reports of the listed banks will be the source of secondary data.
Suardika and Dewi (2021)	To determine the impact of CAR ratio, LDR and operation expense on NPLs of MFI in Indonesia.	The author employs surveys in collecting data for the period 2008 to 2020.	CAR influences the quality of the portfolio negatively while operation costs influence it positively.	The study focus was on microfinance institutions and not commercial banks.	The study will be limited to listed commercial banks in Kenya.
Khan et al. (2015).	The effect of lending rates on NPLs in Pakistan.	The author covers the period 2008 to 2014 and data is analyzed using regression.	A positive relationship between lending rate and non-performing loans.	The study focus was on lending rates and not determinants of interest rates.	The study will explore CAR, OPEX and the cost of borrowing effect on the quality of the credit portfolio.
Wakaria (2016)	The link between credit risk and the performance of MFIs.	The author covers the period 2012 to 2016.	Credit risk negatively influenced financial performance.	The study was focused on credit risk and not interest determinants.	The current study focuses on interest determinants.

Author	Focus of study	Methodology	Findings	Research gap	Focus of the current study
Onuko, Muganda, and Musiega (2015)	The association between credit risk and the credit portfolio quality of tier I banks in Kenya.	The study relies on qualitative and quantitative data collection sources and uses a descriptive research design.	A positive association between cost of borrowing and the quality of the credit portfolio.	The study focused only on cost of funding and tier I banks.	The study explores operating costs, cost of borrowing and capital adequacy and tier I and tier II banks.
Kananu and Ileri (2015)	To investigate how operating costs impact the cost of borrowing of commercial banks in Kenya	Data collection is via primary means using questionnaires and secondary means using the audited reports of the banks.	A positive association between operating costs and banks' lending interest rates in Kenya.	The focus was on how OE impacts cost of borrowing and not the quality of the credit portfolio.	The study will explore capital adequacy, OPEX and the cost of borrowing link to credit portfolio quality.
Kiaritha, Gekara, and Mung'atu (2014)	The effect of operating costs on Saccos' financial performance in Kenya.	The study employs the questionnaire research instrument.	Operating expense is a high cost that impacts the profitability of SACCOs negatively.	The study focused on the financial performance of Saccos and not banks.	The study will explore CAR, OPEX and the cost of borrowing effect on the quality of the credit portfolio of banks.
Makri, Tsagkanos, and Bellas (2014)	The determinants of NPLs for banks in the Eurozone.	The author covers the period 2000-2008. and data is analyzed using econometric model.	A positive relationship between the study's macro-economic variables and NPLs.	The study focused on banks in the Eurozone and not the local setting, Kenya.	The study will explore CAR, OPEX and the cost of borrowing effect on the quality of the credit portfolio.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the population of the study, research design, data collection, and data analysis methods.

3.2 Research Design

The descriptive design was employed for the investigation. It evaluates variables and determines a statistical association or correlation but does not control extraneous variables (Mugenda, 2003).

3.3 Population of the Study

The population covered 12 banks in Kenya (see Appendix I). A census was done; hence, the entire population was selected.

3.4 Data Collection

The data for this study was extracted from the CBK's annual banking supervision report, as well as individual banks' websites and disclosures. The cost of borrowings, capital adequacy, and credit portfolio quality were retrieved from the balance sheet of commercial banks, while operating costs were extracted from the bank's income statements. Data covered 2017 to 2021.

3.5 Data Analysis

The research factors for interest rate drivers which are described and shown using descriptive statistics. Correlation was adopted to assess the variables nature and strength. Regression was determined using the linear regression analysis.

3.5.1 Analytical Model

The study adopted the linear regression model. The model specification is presented here:

$$Y = \alpha + \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Y = Credit portfolio quality given by the non-performing loans / Total loans

α = constant (y intercept)

X_1 = Cost of borrowings given by interest expense / Total borrowings

X_2 = Capital adequacy given by Total bank capital / Total Assets

X_3 = BOPO given by operating costs / operating income

3.5.2 Significance Test

The F-test evaluates the general significance of the regression model. The coefficient of determination, R^2 , explained the variability of the overall regression model. Thus, test was established at 0.05% level.

CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter focuses on the analysis and the interpretation of the data collected.

4.2 Descriptive Statistics

Descriptive statistics gives a presentation of the study dependent and independent variables.

Table 4 1 Descriptive Statistics

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Credit portfolio	55	.142841	.0925674	2.181	.322	4.378	.634
Cost of borrowings	55	.051476	.0160538	.743	.322	.011	.634
BOPO	55	1.008650	1.2144564	2.856	.322	7.123	.634
Capital adequacy	55	.141249	.0448409	1.035	.322	7.767	.634

Source (Author, 2022)

The mean value and standard deviations for the cost of borrowing is ($Mean = 0.0514$, $SD = 0.016$) whilst for capital adequacy is ($Mean = 0.142$, $SD = 0.045$). The standard deviations for the cost of borrowing and capital adequacy are small, which shows that the two data sets are not widely dispersed over the period under consideration. The low standard deviation is due to capital adequacy being dictated by the central bank to prevent commercial banks. There is some dispersion in the data for the dependent variable, credit portfolio quality and BOPO as highlighted by their standard deviations,

0.092 and 1.214, respectively, since micro and macro-economic factors dictate them in the environment.

The nature of the data distribution further indicates positive skewness (skewness statistics) for credit portfolio quality (Sk = 2.181), cost of borrowings (Sk = 0.743), BOPO (Sk = 2.856), and capital adequacy (SK=1.035). As a result, the statistics for this study are more positively skewed. The range of skewness and kurtosis values between -2 and +2, however, is regarded as sufficient to demonstrate a normal distribution (Muzaffar, 2016). Based on this, it can be concluded that all of the study's variables are normally distributed because their skewness is within acceptable bounds.

4.3 Correlation Analysis

The relationship among the study variables is established using the Pearson correlation. It was done to test compliance with the assumptions of the factors that determine the quality of the credit portfolio, specifically interest rate (cost of borrowings), capital sufficiency, and BOPO. The correlation matrix of test variables is summarized in Table 4.2.

Table 4 2 Correlation Matrix

		CPQ	Cost borrowing	Capital adequacy	BOPO
Credit portfolio Quality (CPQ)	Pearson Correlation	1	.001	-.583**	.689**
	Sig. (2-tailed)		.997	.000	.000
	N	55	55	55	55
Cost of borrowings	Pearson Correlation	.001	1	.079	-.003
	Sig. (2-tailed)	.997		.565	.985
	N	55	55	55	55
Capital adequacy	Pearson Correlation	-.583**	.079	1	-.529**
	Sig. (2-tailed)	.000	.565		.000

	N	55	55	55	55
BOPO	Pearson Correlation	.689**	-.003	-.529**	1
	Sig. (2-tailed)	.000	.985	.000	
	N	55	55	55	55

Source (Author, 2022)

The listed commercial banks quality of credit portfolio recorded strong positive correlation with BOPO ($r = 0.689^{**}$, $p = 0.000$). Consistently, the correlation between the cost of borrowings (interest rate) and the credit portfolio quality is positive but weak ($r = 0.997$). Further capital adequacy had a negative and strong correlation ($r = 0.583^{**}$, $p = 0.000$) with portfolio quality. Pallant (2011), contends that a correlation value exceeding 0.7 may be a sign of multicollinearity. There is no multicollinearity in this study since the correlation among the independent variables (cost of borrowing, capital sufficiency, and BOPO) is less than 0.7.

4.4 Regression Analysis

A model's values depend on two or more variables which can be predicted using regression analysis. It describes how different independent/predictor variables currently relate to one dependent variable.

Table 4 3 Overall Fitness of the Model

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate	Durbin-Watson
1	.736 ^a	.542	.515	.0644595	1.299

a. Predictors: (Constant), BOPO, Cost of borrowings, Capital adequacy

b. Dependent Variable: Credit portfolio quality

Tables 4.3, 4.4, and 4.5 show the linear regression findings in more detail. According to the results, in Table 4.3, the adjusted R-Square is 0.515. Thus, the cost of borrowings, capital adequacy and BOPO explain 51.5% of the variation in portfolio credit quality. Thus, 48.5% explain other elements not covered in the study. As shown in table 4.4 p-value < 0.000, thus the model is said to be significant.

Table 4 4 Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.251	3	.084	20.121	.000 ^b
	Residual	.212	51	.004		
	Total	.463	54			

a. Dependent Variable: Credit portfolio quality

b. Predictors: (Constant), BOPO, Cost of borrowings, Capital adequacy

Source (Author, 2022)

Table 4.5 presents the regression results where the predicted variable, quality of the credit portfolio is regressed against the predictor variables cost of borrowing (interest rate), capital adequacy, and BOPO. Also, the cost of borrowing (interest rate) association is positive ($\beta = 0.151$) and insignificant (p-value = 0.784). Capital adequacy is negative ($\beta = -0.632$) and significant (p-value = 0.009). However, BOPO association is positive ($\beta = 0.040$) and significant (p-value = 0.000). The model fit is shown below:

$$Y = 0.184 + 0.151X_1 - 0.632X_2 + 0.040X_3$$

Table 4 5 Regression Coefficients

Model		Unstandardized		Standardized		
		Coefficients		Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.184	.046		3.990	.000
	Cost of borrowings	.151	.549	.026	.276	.784
	Capital adequacy	-.632	.231	-.306	-2.730	.009
	BOPO	.040	.009	.528	4.721	.000

a. Dependent Variable: Credit portfolio quality

Source (Author, 2022)

4.5 Discussion of the Findings

The regression and correlation findings indicated a positive but insignificant influence of the cost of borrowing on the portfolio credit of banks. This implies that the number of NPLs always rises, regardless of the banks' lower interest rate offers made during a time of financial crisis. On the other hand, over time, NPL is proportionally correlated with interest rates (Bahruddin & Masih, 2018). Similar findings were made by Pullicino (2016), who discovered that in Europe, interest rates had no significant impact on NPLs in commercial banks.

The correlation and regression findings also indicated that capital adequacy influences the quality of the credit portfolio negatively and significantly. This means the lower the bank's capital, the higher the NPLs. The management of low capitalized banks have a tendency to engage in high-risk activities and make loans without sufficient credit rating and monitoring. These actions cause an increase in loan defaults, resulting in the inverse association.

Akin to that, Koju et al. (2018) and Kumar and Kishore (2019) found an inverse correlation. The results, however, contradict Constant and Ngomsi's (2012) assertion that NPLs and CAR have a positive relationship. They argued that banks with high capital levels quickly since they contend those loans will prevent them from going bankrupt and failing. As a result, they are more actively involved in these risky credit activities.

Also, the regression and correlation results indicated that operational costs to income ratio (BOPO) have a positive and strong link with the quality of the credit portfolio. Higher loan rates result from banks' attempts to recover rising costs of financial intermediation. These expenses include those related to determining a borrower's risk profile, monitoring the numerous projects for which loans have been issued, and expanding the branch network to cover as many people and regions as possible. Suardika and Dewi (2021) also found a positive association between operating costs and NPLs of Village Credit Institution in Indonesia

The model summary showed that 51.5% of the fluctuations in the credit portfolio, as shown by the R-value, could be attributed to capital adequacy, cost of borrowings and BOPO (Operating cost to operating income). Therefore, 48.5% of variances in credit portfolio quality is due to outside forces. Given the p-value of 0.000, it was determined that the model was significantly fit.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The section involves a presentation of the findings, conclusions, limitations, and suggestions for future studies.

5.2 Summary of Findings

Correlation analysis revealed a positive and strong correlation between the operational cost to income (BOPO) and credit portfolio quality. At the same time, the findings indicated a strong negative correlation between capital adequacy and credit portfolio quality. Interest rate (cost of borrowing) had a positive but weak correlation with the quality of the credit portfolio.

The adjusted R-square is 0.515, implying that the independent variables can expound 51.5 per cent in the quality of the credit portfolio variations. In comparison, 48.9 per cent originates from other elements.

The regression results indicated that by setting the independent study variables to zero, the credit portfolio quality would be 0.010. Additionally, a unit change in the cost of borrowing (interest rate) will increase CR quality by 0.151. A unit change in capital adequacy will decrease CR by 0.632: a unit change in operational cost to income (BOPO) will increase CR by 0.040, holding other factors unchanged.

5.3 Conclusions

The study established that the cost of borrowings positively but insignificantly influenced the quality of the credit portfolio of listed banks in Kenya. The study also found that capital adequacy influenced credit portfolio in a negative and strong way. We therefore conclude that a large capital base contributes to improvements in the portfolios of the selected banks.

Further, the research established that BOPO (Operational cost to income ratio) had a direct and significant association with the portfolio. We therefore conclude that a lower BPO ratio helps improves the credit portfolio of banks.

5.4 Limitations of the Study

The research was limited for 5 years, 2017-2021. Thus, we proposes future studies elongate the durations to capture elements of economic importance such as booms and recessions. Longer periods may give more generalized findings.

The accounting records serve as the foundation for the financial statement reporting. As a result, any mistake in the accounting or financial records affects accounting reports and any other vital report that investors rely upon.

5.5 Recommendations

In Kenyan banks, policymakers can reduce the proportion of non-performing loans by lowering banks' lending rates because interest influences portfolio insignificantly. Collection policies can be put in place and only customers with high scores can be selected to be advanced loans.

The research proposes institutions also increase their total capital which will enable them enhance their credit portfolio quality. This is because capital adequacy was negatively linked to NPLs. This will enable banks improve their credit management.

BOPO affects the quality of the credit portfolio. The lower the BOPO, the better the credit portfolio quality; therefore, conventional banks need to pay close attention to management or operational cost efficiency and maximize operating income to keep the ratio within manageable limits. As a result, good cost management is a requirement for banks in order to reduce NPLs and improve the quality of their balance sheets.

5.6 Suggestions for Further Research

Future studies could investigate the relationships between endogenous and exogenous factors as determinants of interest rates, or they could concentrate on the empirical effects

of controlling for credit portfolio quality. They could also attempt to split the determinants of interest rates into endogenous and exogenous factors.

The study focused on three interest rate determinants (capital adequacy, cost of borrowing and operating cost to income). Other elements such as unemployment and inflation—can be examined in the future.

The study proposes that other scholars examine what influences interest rates in the determination of the portfolio quality offered by MFIs and Saving Societies in Kenya to understand the real effects.

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APPENDICES

Appendix I: Listed Commercial Banks in Kenya

- | | |
|---------------------------------|-------------------------------------------|
| 1. ABSA Bank Kenya PLC | 8. NCBA Group PLC |
| 2. Stanbic Holdings PLC | 9. Standard Chartered Bank Ltd |
| 3. I & M Holdings Ltd | 10. Equity Group Holdings |
| 4. Diamond Trust Bank Kenya ltd | 11. The Co-operative Bank of Kenya
Ltd |
| 5. HF Group Ltd | 12. BK Group Plc |
| 6. KCB Group Ltd | |
| 7. National Bank of Kenya Ltd | |

Source (NSE, 2022).

Appendix II: Raw Data

		NPLs	Total loans	Total assets	OPEX	Gross revenue	Total capital	Total interest	Total liabilities
KCB	2017	34,182	411,666	555,630	40,910	71,385	78,020	15,228	540,703
	2018	30,012	434,361	621,723	37,642	71,803	95,596	17,450	600,652
	2019	34,786	468,258	674,302	47,568	84,301	101,067	18,220	768,831
	2020	66,810	544,837	758,345	70,800	95,996	126,674	20,807	845,387
	2021	92,183	584,441	826,395	61,547	109,323	138,433	24,463	966,165
	Equity 2017	14,758	221,698	406,402	31,909	58,791	61,902	10,841	431,323
	Equity 2018	17,064	231,026	438,509	32,114	60,577	55,864	11,808	478,427
NCBA	Equity 2019	26,185	290,564	507,525	35,295	66,773	82,739	14,740	561,905
	Equity 2020	42,825	355,630	667,650	40,083	62,253	92,118	18,616	876,452
	Equity 2021	35,470	420,774	877,415	48,117	99,998	132,496	25,534	1,128,723
	2017	21,063	225,497	422,342	11,041	17,491	59,094	9,740	214,499
	2018	25,101	236,057	427,372	11,041	17,491	147,473	9,740	214,499
	2019	30,516	244,395	464,891	15,584	26,754	65,182	12,509	427,458
	2020								

	0 202	35,995	259,698	491,614	40,033	46,437	61,233	18,751	455,406
	1 201	40,909	255,664	546,734	33,450	49,151	64,658	19,477	513,101
Co-op	7 201	18,714	262,553	382,830	25,327	45,596	81,048	12,269	317,045
	8 201	28,953	257,566	408,304	25,574	43,560	28,732	12,240	342,915
	9 202	31,156	281,516	449,616	27,531	48,197	64,712	12,640	376,680
	0 202	51,781	307,324	496,823	39,098	53,530	77,446	12,791	445,453
	1 201	43,312	334,274	540,387	37,808	60,152	85,952	14,893	479,484
ABSA	7 201	12,615	177,224	271,682	19,898	30,529	43,934	5,397	227,078
	8 201	13,910	186,984	325,363	17,177	31,694	42,880	7,069	281,107
	9 202	13,519	205,304	374,109	18,815	33,768	46,434	7,845	329,715
	0 202	17,099	229,677	377,936	25,673	34,522	51,909	8,059	332,937
	1 201	19,817	256,465	428,746	21,372	36,921	56,357	6,781	372,242
SC	7 201	17,621	139,406	285,125	12,785	26,626	42,242	8,005	24,059
	8 201	21,661	133,166	281,516	14,579	27,755	41,777	7,807	238,764
	9 202	20,058	144,483	302,296	15,542	27,950	43,038	6,148	254,377
	0	22,337	152,711	325,873	20,011	27,407	45,676	4,617	274,715

	202								
	1	23,283	147,917	335,111	16,566	29,164	46,670	3,475	281,658
	201								
DTB	7	11,901	156,843	270,082	10,560	25,766	38,790	13,988	309,684
	201								
	8	11,036	152,287	284,691	11,503	26,171	45,102	14,259	318,780
	201								
	9	12,892	155,307	287,251	11,902	2,550	48,907	12,773	321,715
	202								
	0	19,747	165,948	312,189	12,344	25,143	51,543	11,782	356,740
	202								
	1	27,151	171,866	326,377	12,326	27,393	53,031	12,774	382,290
	201								
I&M	7	17,669	126,983	183,953	5,958	13,830	32,227	8,011	166,776
	201								
	8	21,115	144,434	229,161	6,449	15,630	35,785	9,202	209,253
	201								
	9	18,799	152,807	254,252	7,062	19,518	45,276	10,245	225,638
	202								
	0	20,178	160,665	283,569	7,613	18,311	49,335	10,457	251,020
	202								
	1	18,563	172,615	307,802	9,418	20,653	52,850	9,926	279,776
	201								
Stanbic	7	10,359	135,443	239,408	10,902	16,303	36,208	5,964	205,783
	201								
	8	16,644	155,498	280,953	11,082	20,030	39,657	7,118	245,947
	201								
	9	19,345	163,859	292,705	13,461	20,927	43,687	7,663	253,791
	202								
	0	25,038	176,597	318,986	11,638	22,750	46,444	7,542	277,126
	202	22,504	200,941	319,199					272,688

	1				12,391	24,482	49,835	6,233	
	201								
NBK	7	27,658	68,153	109,942	7,418	1,810	4,771	3,238	102,639
	201								
	8	31,461	66,123	115,143	7,792	1,340	3,419	2,885	107,876
	201								
	9	25,175	60,677	112,029	9,168	9,030	7,734	2,718	100,175
	202								
	0	26,438	74,774	126,842	8,560	1,914	7,835	2,698	114,696
	202								
	1	26,542	79,236	146,534	8,764	1,991	11,605	3,964	129,940
HF	201								
Group	7	8,212	52,630	62,127	3,412	4,323	9,109	4,156	56,092
	201								
	8	13,334	49,215	57,083	3,861	3,585	7,611	3,780	50,178
	201								
	9	12,316	45,822	54,532	3,214	3,072	6,371	3,149	46,263
	202								
	0	4,838	44,531	54,478	3,750	1,974	4,200	2,399	46,883
	202								
	1	5,199	47,577	52,098	3,226	2,366	4,652	2,095	44,935